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Depressions of the Earth.
Surprise has been manifested and inquiries have been made as to the cause of mountains, but the cause which produced the valleys or depressions of the earth is just as mueh a matter of wonder. Some suppose-indeed, it is a very general opinion-that all the lower parts of the earth's surface are covered with water, but this is not exactly so. Seas, lakes and rivers are only lower than sur rounding lands, but there are many inhabited portions of our globe which are much lower than some great seas and lakes. Thus the waters of Lake Erie are about two hundred feet higher than the rich cultivated plains surrounding Lake Ontario, but the latter lake is some feet lower than these plains, and is the receptacle of their drainage waters. The most extensive and wonderful depression of the earth is in Asia. It is a vast region of about 18,000 . leagues square ; it is occupied, to be sure, mostly by the Caspian Sea, but it also contains populous cities and extensive cultivated districts situated in a depression of three hundred and twenty feet below the level of the Black Sea.
It is an opinion pretty generally admitted by scientific men at the present day, that the mountains have been formed by the upheaving of their materials, and that they have issued from the bosom of the earth. The necessary consequence of a vast upheaval would be the depression of another portion of the earth. Asia abounds in lofty mountains, and the vast depression of the Caspian Sea and its adjacent plains is surrounded with great mountain chains, hence it is supposed that the elevation of these masses caused a consequen depression of the Caspian valleys.

## Invention of the Microscope.

It was in 1664, when John Milton's "chief of men," who had wielded the power of England with a firm and vigorous hand, strongly contrasted with the royal but feeble fingers which previously and subsequently endeavored to direct it, had gone to his account, and just after the rupture of the close union which had endured, almost without interruption, for near ly seventy years, between England and Holland, that a Dutch youth of eighteen, holding a glass thread in the flame of a candle, perceived that the melted extremity assumed a spherical form. The intelligent lad instantly seized on the happy accident. He had seen Leuwenhoeck manufacture lenses, such as they were, and went on burning his glass threads, and attempted to place his little spheres between two pieces of lead, through which he made an aperture with a pin's point. Placing a hair before this simply-constructed instrument, he found to his great joy that he was the maker and possessor of a capital microscope for those times, and he secured to the micrographers of the day what they had so long sought.-American Druggists' Circular.


The accompanying engraving represents a most valuable mill for crushing sugar cane patented April 27, 1858, by Frederick E. Dake and Thomas E. Hunt, (assignees of Frederick E. Dake, of Indianapolis, Ind.,) which from its power and simplicity recommends itself to all who use sugar mills and crushing apparatus.
The peculiar advantages of this mill are its cheapness of construction, requiring no gearing, and such compactness of form as insures its portability, and easy management by a single operator. It is also so arranged as to secure a uniform pressure upon stalks of various sizes.
A is a bed plate, firmly attached to the platform, B. C C are rollers in the frame, J,
which is allowed to oscillate upon journals The lever frame, $D$, at $E$, increases the pressure to any extent desired. The contact of the rollers, C C, with the bed plate, A, is regulated, securing the required pressure by adjusting the set screw, K .
The cane is fed into the hopper, $F$, and as the lever frame, D, is revolved, it passes under the rollers, C C. The juice is expressed upon the bed plate, A, in front of the rollers, C C, and running into the groove, $G$, is discharged at the spout, H . The crushed cane is scraped from the bed plate A, by the scraper I, as the rollers pass over it.
Communications desiring further information may be addressed to Hunt, Dake \& Co. Indianapolis, Ind.

ELMER'S MACHINE FOR GUMMING SAWS.


A saw when it is to be gummed should be held perfectly firm that it may be cut quite true, and the cutting tool should be of such construction that it will fairly cut away the metal and not tear it. The machine for filing, gumming and jointing saws (of which
our illustration is a perspective view) is the invention of H. O. Elmer, of Mexico, N. Y., and was patented by him Feb. 2, 1858, and assigned to J. P. Slack and P. J. Babcock, of the same place.
A represents the bed or frame of the ma-
chine. This frame is composed of two parallel metal bars connected at one end by a bolt passing through a block that determines the distance apart between the parallel bars. B B represent two bars, each of which is provided with friction rollers, $d d$, running in grooves, $a$, of the frame, A. The front end of the bars are connected by a curved traverse bar, $f$, in which the end of a screw rod, C , is fitted and allowed to turn freely. A spiral spring is placed on the end of this rod and confined between the bar, $f$, and a plate, $h$, attached to the bar, the curve of the bar forming a place to receive the spring. The rod, C, passes through a nut, $D$, placed on the end of the frame, and the outer end of the screw rod is provided with a hand wheel, E.
F is a shaft which is placed transversely on the bars, B B, and it carries the cutter, G. This cutter is cylindrical, and the cutting edges are of a zig-zag form, or are placed spirally around it. A crank, $H$, is used to rotate the cutters. It will be seen that by rotating the wheel, E , the bars, B B, and cutter, G, may be moved back and forth on the frame, A. To the inner side of one of the frame bars is attached a plate, I, and at the outside is a lever, J , provided with a cam so arranged that by pulling out the lever, $J$, the cam will force the saw against the plate, I, and hold it firm in the frame between the bars. $a^{\prime} a^{\prime}$ are grooves in bars of the frame to lighten it, and at the same time not to interfere with the grip: $K$ is the saw.
The implement is used as follows:-The frame is passed on the saw, and the bed is firmly clamped to the saw by turning the lever, J , so that it will be pressed against the plate, I. The gummer is then rotated with one hand by the crank, H , while the other hand is employed in operating the wheel, E, which keeps the cutters against the saw which operate on the upper and under surfaces of the teeth, thus making them of uniform size, and the spaces between are also made uniform. By this mode of constructing the frame the gummer is applicable to reciprocating as well as circular saws, for the back being open, it can be fixed on a saw of any width.
Any further information concerning this gummer can be obtained by addressing the assignees as above.

## New Remedy for Consumption

Ergot of rye, or spurred rye, has received the approval of the Academy of Medicine at Turin, as one of the most active remedies for consumption. Dr. Parola, the author, describes its action as infallible, if not in curing the disease, at least in staying the pulmonary inflammation which constantly accompanies the formation of the tubercle. He administers thirty-one grains of the powder per day, and suspends it every four or five days for forty-eight hours. When the stomach is too weak, the resinous extract may be administered in pills instead of the powder, to the amount of one and a quarter grains, or else a portion in a solution of gum. Quinine, foxglove, and even opium, may sometimes be administered together with it. By this treatment Dr. Parola has cured sixteen cases out of thirty-one of alleged confirmed consumption in an advanced stage.

## Hot Air Engine for Egypt.

A very neat and well-made hot air engine was shipped for Egypt from this city by the Ericsson Co., on the 9th inst. It is designed to pump water from the famous river Nile, to supply one of the palaces of the Pasha.

## Sicuntific Ammericam.







 the hop yessel, and the corpper, as con ne ected and made
to operate together, substantially as set forth.



 as and for the purpose set forth.
[This is an improvement in the slides or guide bars of
the table, whereby the sidies or or gide the table, whereby the slides or guide bars are not only
firmly connected with each other, but are also allowed dirml connected with each other, but are also allowe
to slide freely past each other, so that the table may be readily folded and extended, and still be kept perfectly firm in every position.]

 ber, ee and radial arm, 6789 , substantially as and
tor the purposes set forth.






Brvou Prane-H. L. Kendall, of Baltimore, Md.
am aware that wedges have been inserted in plan mouth tor ompen sating for wear on the under
face of the plane ; such, there tore, , do not claim.






[The dog which is attached to the hammer is fur
nished with an additional tooth, so arranged relatively to the tooth which rotates the chambered cylinder, and
to the ratchet wheel of the cylinder, as to act as a stop to the ratchet wheel of the cylinder, as to act 8 a a stop
in combination with one of the teeth of the cylinder, to In combination with one of the teth of the cylinder, to
prevent the latter being rotated beyond the proper disformed for this purpose.]


 [This a novel mode of constructing the elliptit spring forvehices, Whereby the spring is made ilghter than
unual equally elessic, and as strong, and the cost is
much reuaced. The invention consists in constructing the spring of steel and wood combined-curved bars of elastic wood, such as hickory, being secured in a
culiar way to the inner and steel main plates.]

 tor the purposes set forth.






 his specification as constituting his claim, to make an
anction such as I produce upon the hammers of a piano-
Corte forte. $I T$ Claim in, the formation and position of the but
as deseribed. and tor the purposes set forth.
 and back cheek, sub
purposese set forth.



 other column.]




 Mose of retracting subte ta cartrialige ase case.
 Shecond. $I$ claim the extension perch, constructed in
the manner specified.





 cation to that condition, ass it it is obvious thatitit cap be be
used as well when the horizon is is isible; but it is un-
 Indion confanu anyself to the the use of any particular
sensitive preparation for the concave surface of the
ond hemisphere. he hollow hemisphere having its con-
cave surfaice the prepred with a sensitive coating, and

 [See description of this invention on another page.]
 BEE HIvEs-Thomas Proser, of Birmingham, Pat: I
chain the combination in bee hives of the labyrinthian
 the ped relatively to to



[The nature of this invention and improvement con ists in securing the revolving portion of the heel to the boot in such $a$ way as $t$ enable it to be readily attached
and detached when desrred, and revolved and securely
fastened at every fastened at every quarte
tne inequality of wear.]





Audomatio Gratn-Weighing macuine-William





















Stran Powre Mrxz-George, Schuh, of Madison
Ind: I claim the combination of the one independent




 rate manner to the friction wheel, c, for the purposes
mentione
chird ${ }^{\text {And }} \mathrm{I}$ furrher claim providing the driring
cords.



























 atraaleton aresesini iron tor tid has ben previousy




 Tothti, iononection with the shere eand fork


 Hhen it is desired to open the bottle or vesesel.
 vessels, which affords great facility for their removal
after having been cemented on to the bottles or vesseld for the purpose of sealing the same hermetically.] SmuT MAourinss-Duncan M. Vance, of Urbana,







 [An engraring and descripition of this invention will
appeari in few weeks]








 [This invention is designed for an inside lock or bolt,
and is intended to supersede the usual slide bolts and catches hitherto employed for such purposes. The invention consists in the peculiar manner of securing the arbor of the knob in the lock, said knob having a bit
attached to its inner end, and operating the bolt as the arbor is turned, the device forming a neat and orna-Harvegrers-Thos. Wendell, of New Albany, Ind. :
I clait the arrangenent of the rake, a, on the endless
belt, b, operated around and below the stationary plat--


## Sicuntific American.








 the curved arm or bar, B, and the graver carriage, D,
as combined, together and with the graver lever,
and
fied andmade to operate therewith, substantially as speci-
fied.

1. also claim the adjustable weighted arm, $F$, in com-
bination witith the balanced tracer arm or graver. $E$. bination with the balanced tracer arm or graver. E.
I also claim constructing the tracer carriage, in
two parts b o substantill as describe, in order that
the tracer or sraver may be adjusted in a vertical di-
 I also claim making the arm, H, and the stop, L, ad-
justable on theirishaft and rod as described, in order to
brin them into proper position to cuse the eleyation
of the graver under any situation of it on the surface of of the graver under any situation of it on the surface of
the cylinder and when the lever, i , is moved back ward.
I also claim making the weight. $G$, in two parts, 1 m . I also claim making the
for the purpose specificd.
Machine For Finishing Soldere TVBing-Ed-
mund Jordan (assignor to the Benedict \& Burnham
Manuf acturing Company), of Waterbury Cond

 to a trached to the levers, H , the whole being arranged to operate as
and for the purpose specified. page.]
 But I claim the combination of the auxiliary turning
stop h, and its recess,, or the equivalent thereof with
the nain stop, applied toone of the slides, and the
rebate made in the other, the whole beind rebate made in the other, the whole being as and for
the purposedescribed.
I aspoclaim the combination and arrangement of the twospring catches, m n, catch bars, $q$ r and the space,
p, whereby during the motion of the supporter, s , on its hinges, one catch is made to pass between the two catch
bars and one catch bar to pass between the two catches.


 combination with the stationary thread, carrier, K , in
mechanism onerating toeding purpose specified.
S.econd, The combination of the shuttle, R, and hook.
fastened to Second, The combination of the shuttle, R, and hook.
fastened together, or their equivalents, operating
substantially in the manner and for the purpose desubstantially in the manner and for the purpose de-
scribed.
Third, The shuttle carrier, U, the case, S, and the
crospiece, , when operating to, ether substantially in
the manner aud tor the purpose described. crosspiece, P, when operating to gether sub
the manner aud tor the purp ose described.

 [This invention consistsin the employment of an elas tic tube or ring placed within the coupling, and arranged in relation to the other parts that the pressure of the water within the hose will keep the coupling
water-tight. There is also a peculiar means for con-water-tight. There is also a peculiar mea
necting the heads of the coupling together.]




 But T claim, first, The mode oi the beaking and com-
pletin the circuit, or verse, that is, by the spring
circuit breaker operating to cause tiae vibration of the
armature.
 self. vibrating armature, that the yibrations of the lat-
ter shall prounce a continued ringing of the bell u nder
circumstances substantially as described.
Third The combination of these parts, namel y, the

 continued ringing of the bell by the interruption of the
electric current without intervention of other ma-
chines.

set forth.
STove Doons-R. H. N. Bates, of Providence, R. I.,
assignor to himself and Isaac Backers, of Canterbury, assignor to himself and Isa.
Conn., and J. P. Barstow.

A New Gnomon
A correspondent informs us that a friend of his has invented a new gnomon for sun-dials, which is simply a piece of thread or twine carried at an angle from the center of the dial to a post set at one side. This gives the time at noon with accuracy, which no other gnomon will do.

Dialing.
Messrs. Editors-From the notice of sunMessrs. Editors-From the notice of sun-
dials in a late issue of the Scientific American, I am led to make the following remarks :-
There is no more beautiful or ingenious in strument than the sundial; when correctly made and its use properly understood, it can present the true time with an unvarying exactitude to be found only in the works of the Divine Artificer, upon which its power de pends. The only difficulty lies in the variable nature of the shadow's progress through the varying nature of the sun's course, which will give a different reading to the hour circle from the mean, or average or clock time While the dial indicates solar time, varying with the season, the clock presents equable or mean time, being the precise or exact division of the hours and minutes to their equable length, yet there is no real difference between the two. They both come to the same con-
clusion, and both precisely accomplish in a given period their due degree. Hence with the smallest possible trouble it is easy to find the very thing sought, and at any time to discoyer the true clock time. The following table will answer for such indication to any person using a dial

The sun's center is on meridian, and the dial shows noon on

| $H . m . s$. |  |
| :---: | :---: |
| 12 | 4 |

Jan. 1, when theclock timeshows $124 \begin{array}{lll}12 & 3\end{array}$

| Feb.1, " |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
| Mar. 1, | " | " | 13 | 57 |

$\begin{array}{lllll}\text { Mar. 1, } \\ \text { April 9, } & \text { " } & \text { " } & 12 & 0 \\ \text { May } 9\end{array}$
May 9,
June 9,
July 1,
Aug. 1,
Sept. 1,
Oct. 1,
Nov. 1,
Nov. 1,
Dec. 1,
115655
115731
$12 \quad 0 \quad 20$
$\begin{array}{lll}12 & 3 & 29 \\ 12 & 6 & 00\end{array}$
$\begin{array}{lrr}12 & 6 & 00 \\ 11 & 59 & 46\end{array}$
$\begin{array}{lll}11 & 59 & 46 \\ 11 & 49 & 35\end{array}$

| 114935 |  |
| :--- | :--- |
| 11 | 43 |

By this it will be easy to see how much difference should be allowed for the equatio of time, and at any period to find the clock time by the dial indication.
It must be remembered, however, that dial to be exact must be most carefully placed. Simply setting a dial north and south is not at all sufficient. Pains must be taken to secure a true meridian, and before the dial is located, that meridian should be found with great exactness, so that in setting the dial (if horizontal) the gnomon shall be perfectly adapted to the true meridian of the place where it is to stand.
It would seem that an agreeable and really useful accompaniment to the dial would be a prolongation of the horary circle, sufficient to allow the scale of signs to be inscribed, and the style to track out the sun's path through the heavens, and thus unerringly indicate his place in the ecliptic. If in either side of the astronomic signs the names of the months were written, it would be a most pleasing occupation to notice month by month the progress of the sun in his vibrations backward and forward, and to children it would show clearly the motion of that planet. R.W.
[The above communication on the construction of sundials is not only interesting but valuable, and the facts contained have the freshness of positive experiment, and are consequently of interest to our readers.-Eds.

Inter-oceanic Canal to the Pacific.
Messrs. Editors.-In the last number your paper I notice an article on the "Interoceanic Canal to the Painif," which, so far as the report of Lieut. Craven is concerned, is perfectly accurate, but is, I think, calculated to mislead those who are not acquainted with the previous history of the project; and as the subject is one of great and universal interest, it is important that no undue prejudice be raised against it.
The proposed route was originally explored by W Kennish, Esq., C.E., whose plans and estimates were published on his return, and submitted to the consideration of eminent engineers, both of this country and in Europe Their opinion as to the practicability of con-
structing a canal, without locks, sufficiently capacious for the passage of the largest ves-
sels from ocean to ocean, was unanimously sels from ocean to ocean, was unanimously Kennish should be found correct. The expe dition under Lieut. C. was therefore sent, no to survey any new route, nor to make furthe explorations, but merely to verify the state ments of Mr. Kennish. He has not contra dicted a single one of these statements so far and his hasty condemnation of the project is, therefore, wholly without reason, for all the difficulties he urges against it were met and estimated for, in the report of the original survey. In this state of the case it is impos sible to pronounce judgment until the repor of Lieut. Michler, Topographical Engineer of the late expedition, shall have appeared, when the question will be settled by the scientific world.
These facts should be made known, in justice to the promoters of an enterprise of which if successfully completed, the whole world may well be proud. Yours,

James A. Rockwell.

## New York, June, 1858.

## A Pleasant Testimonial

Messrs. Editors-I took out two patent through the Scientific American Agency, bearing date April 21st and July $\mathrm{y}_{6}$ 21st of last year and I now wish to return you my sincere thanks and good-will for the reliable and beneficial information I received from you and your Examiners. You gave me no trouble in securing my rights; and I now discover that you have made my claims to cover both inventions much broader than expected, which has made my claims of much more value to me. I shall soon have anothe case, and shall surely call at your Paten Agency to have it prepared.

## John Woodville.

Chilicothe, Ohio, June, 1858.
[We are gratified to receive this pleasan estimonial from our client, and to learn from him that, in consequence of the care taken in the drawing up of his claims, his patents are, on this account, much more valuable to him It is notorious that inventors who undertake ally not only bothered very much by the Patent Office before their claims can even be examined, in consequence of defective papers, but when they do succeed, it is rarely, if ever, that their claims can stand a litigation.Eds.
Successful Copper Mining in Australia.
On the 29th of September, 1845, the work at the famous Burra Burra mines was commenced by twelve miners; they now give employment to 1,031 miners, and support a population of ner.rly 5,000 persons. Since the commencement of the working, the mines have produced 128,400 tuns of copper ore yielding 25,700 tuns of copper, which, at the present moment, would be worth in Adelaide $\$ 13,415,000$. The wages distributed in these mines amount to $\$ 4,125,000$, while the dividend paid on each $\$ 25$ share amounts to $\$ 1,000$. The present value of its shares is $\$ 1,600.600$. Such an instance of successful mining operations has rarely, if ever, been witnessed in any country.-American Mining Chronicle.

## Cotton Mills in Saxony.

The kingdom of Saxony possesses, as the mother of the German cotton mills, the largest number of any of the German States viz., 139 mills, working 554,646 spindles, with a yearly consumption of 34,200 bales of North American cotton, and 34,000 bales of other kinds. A large mill has just been built which will run 50,000 spindles, and consume yearly about 3,500 bales of North American cotton, and 2,000 bales of other kinds. The total number of mills now in working order is 134, running 604,646 spindles, and consuming annually 36,700 bales of Nørth American and 36,000 bales of other kinds. The largest mill has 50,000 spindles in working order, and the smallest 120 spindles.

Uses of the Potato.
This valuable and nutritious esculent is not only useful to us in the many tempting forms in which it is presented in its anmistakable character, but the farina extracted from it is largely used for other culinary purposes. The famed gravies, sauces, and soups of France are largely indebted for their excellence to that source, and its bread and pastry equally so ; while a great deal of the so-called Cognac imported into America from France is the product of the potato, and imbibed as the pure essence of the grape. The fair ladies of our country perfume themselves with the spirit of potato, under the designation of ear de cologne. But there are other uses which this favorite esculent is turned to abroad. After extracting the farina, the pulp is manuactured into ornamental articles, such as picture frames, snuff-boxes, and several descrip tions of toys, and the water that runs from it is a most excellent scourer. For perfectly cleaning woolens and such like articles, and curing chilblains, it is also successfully employed.

Recent Patented Improvements
The following inventions have been patented this week, as will be found by referring to our List of Claims :-
Feeder for Steam Boilers.-George Brodie, of Little Rock, Ark., has invented a new feeder for boilers, the object of which is to gradually supply steam boilers with water equal at all times to the amonnt evaporated, and used so that the water within boilers will be constantly kept at a given hight, and by the most simple means, requir ing the least possible expenditure of power for its operation.
Machine for Finishing Soldered Tub-wa.-Edmund Jordan, of Waterbury, Conn., has invented an improved machine for finish ing soldered tubing, in which a peculiar means is employed for operating a file or cutter for the purpose of filing or finishing off the soldered seams of the tubes, and there is also a clamp for holding tubes while being operated upon by the cutters. The inventor has as signed his invention to the Benedict and Burnham Manufacturing Company of the same place.
Improved Process of Tanning.-Jesse Morgan, of Sumterville, S. C., has invented an improved method of tanning leather, which consists in treating hides or skins when they have been partly tanned by the usual process, with a compound of sugar or other saccharine matter, glaubers salts and chloride of soda for the purpose of completing the tanning process more expeditiously than when it is completed in the usual way, and at the same time making leather equal in quality, weight and durability to that tanned entirely by the old process.
Helypsometer-This is an instrument for taking the altitude of the sun at sea or on land, to which the inventor, J. Oakes, of New York, has given the above name. The end attained by this instrument is, that with it the altitude of the sun can be taken when the natural horizon is obscured by fog or is invisible from other causes. It consists of two parts, one of which is employed to record the altitude by the action of the sun's rays upon a sensitive coating of similar nature to those employed in photographic processes, and the ther to measure the altitude thus recorded The first mentioned portion of the instrument consists of a hollow hemisphere whose equatorial plane is kept in a horizontal position or as nearly so as possible, and has a.small orifee in the center, and whose concave is prepared with the sensitive coating. The rays of the sun being admitted through the orifice produce a mark upon the sensitively prepared concave surface, and by applying the measuring portion of the instrument to measure the distance in degrees of a circle from the equatorial plane of the hemisphere, the altitude is obtained, being represented by the said distance in degrees.

## gidic ghnentions.

## Machinery Wanted

Mr. John A. Leclerc, of Montreal, Canada, writes to us for information in regard to machinery for making shoe pegs, also for lathes for turning lasts, ax handles, \&c., also a boot crimping machine. There are such machines in this country, and there would be no difficulty in getting them into the Canadas if the government would extend proper protection to the inventor. As it now is, inventors in the United States, deprived of all opportunity to secure their inventions by patent in these provinces, are not over anxious to sell machines to go there, and thereby create a competition which they have not the legal power to regulate.

Improved Coal-Burning Locomotive.
This is an arrangement for regulating the amount of air which is supplied to a coalburning locomotive, and supplying the air at the requisite speed and pressure by means of a fan blast. Our engravings illustrate fully the invention, Fig. 1 being a longitudinal vertical and central section, and Fig. 2 being an inverted plan of the improvement. The great difficulty which has hitherto been experienced in the use of coal-burning locomotives is, that anthracite requires a strong blast to consume it quick enough to throw out the requisite quantity of heat, and the blast created by the escape steam is not enough for this, therefore some extraneous means, such as a fanblower, has to be employed. This invention consists in an arrangement of such a fanblower placed underneath the boiler of the locomotive, and connected with pipes which are provided with valves, and so arranged that the fire may be supplied with a greater or less quantity of air as desired, and when necessary a reverse draft brought down through the flues and the upper part of the fire chamber, in order to lessen the temperature of the boiler.
A represents the boiler of a locomotive. B is the smoke-pipe. C represents the flues which pass longitudinally through the boiler from the fire chamber, D, to the smoke pipe, B. Underneath the boiler a fan, $F$, is placed. This fan is fitted in a proper box, G, which connects at the center of each side, with a curved pipe, H, the pipe being connected with a pipe, $I$, which is fitted within the smokepipe, B. The way in which pipe, I, is made to communicate with the fan-box is plainly shown in Fig. 2. A valve, $a$, is fitted in pipe, I, near its junction with pipe, H. From the periphery of the fan-box, G, two pipes, J K, project, the lower pipe, K, passes into the fire chamber below the grate, $L$, and the end of pipe, J, communicates with the open air. The pipes, J K, have valves, $b b^{\prime}$, fitted or placed on them; these valves, $b b^{\prime}$, are placed on a common rod or axis, and in reverse positions the valve, $b^{\prime}$, being open, when $b$ is shut, and vice versa. M M represent two pipes, one end of which communicates with the fire chamber above the grate, L, and their opposite ends are open to the sides of the fan-box, G. Each pipe, M, is provided with a valve, $c$, the valves of the several pipes all have rods, $d$, attached, which rods extend back at the sides of the fire chamber and within reach of the engineer. The fan, $F$, is driven by belts or chains, $e$, from the truck axles, the belts being enclosed within proper cases to exclude dust, and thereby prevent the wearing or "cutting out" of them.
The operation is as follows :-When an intense heat is required, the valves, $c c$, in the pipes, MM, are closed, and the valve, $b$, in the pipe $J$ is also closed, $b^{\prime}$ in the pipe, $K$, being open. The fire will then be supplied with a blast which passes down the pipe, L, through the curved pipe, H, into the fan-box, G, and thence through the pipe, $K$, into the fire chamber, D, below the grate, L, and through
the flues, C, into smoke-pipe, B-see arrows. $\mid$ in the pipe opened, and the valves, $c$, in the The strength of this blast may be regulated pipes, M M, also opened. The blast will then by adjusting the valves, $a b^{\prime}$. When the tem- pass in the direction of the dotted arrows, perature of the boiler requires to be reduced, down the smoke-pipe, $B$, through $C$ into $D$, the valves, $a b^{\prime}$, are closed, and the valve, $b$, from thence through $M$ into $G$, where the fan,

HARTNETT'S COAL-BURNING LOCOMOTIVE.


Fiy 2

discharges it into the atmosphere through the ${ }^{\text {be graduated as desired. This plan is a great }}$ pipe, J. This reverse daft cools the flues, and so reduces the temperature of the boiler. By this arrangement the fire of a coal-burning locomotive is placed entirely under the control of the engine driver, and the heat can mprovement on the usual one, which is closing the flues and ash pan with dampers. It is the invention of J. M. Hartnett, of Wauconda , Ill., from whom any further information can be had. It was patented July 21, 1857.

LA FRANCE'S IMPROVED THROTTLE VALVE. Itig. 1


The improvements which constitute the ad- $\left.\right|^{\text {section across the axis, and Fig. } 3 \text { a section }}$
vantages of this throttle valve will be appre-
parallel with the axis.
A is a spherical chamber, containing the valve, $B$. It is divided by the partition, C C,
admission of steam into the valve, and the other for the passage of steam from the valve ports to the steam-chest. The latter is annular, and surrounds the valve, as seen at $E$, Fig. 3. The valve is in the form of a hollow frustum, being supported on the axis, F , by four arms or partitions, $b$, which also serve to strengthen against any unequal pressure that it may receive.
The valve seat consists of a shell surrounding the valve, and fitting it closely. It is joined to the partition, C, at one extremity, and to the case, A, at the other. In it are four recesses or passages, $d d$, extending from the chamber, D , and uniting in a single chamber, H , at the end of the valve. The valve stem or spindle is packed and supported in the usual manner, having an adjusting screw at each end, $e e$, to regulate its pressure on the seat; and $I$ is the lever for connecting it with the governor. The valve has four oblong ports or openings at its sides, $f f$; and there are corresponding openings in the seat, $g g$, between the recesses, $d d$.
The steam enters from the boiler into chamber, $D$, filling the interior of the valve, and also the passages, $d$, and chamber, H. As the ports are opened, it passes into the annular passage, E , surrounding the valve seat, and thence to the steam chest. The course of the steam, both in its passage through the valve and through the surrounding chamber, is indicated by arrows. The adjoining surfaces of the valve and seat are grooved, so as to constitute a steam-tight joint, and the adjustment of steam in and upon the valve is such as to reduce friction to a minimum rate, and thus produce what may be called a balanced valve. The pressure of the steam on a considerable portion of the exterior surface of the valve, by means of the passages and chamber, $d$ and H , tends to overcome friction, and makes it sensitive in a high degree, while the interior arrangement is such that the force of the steam in escaping by one port, is counterbalanced by the same force in the opposite positions of the four different ports. The supporting partitions, $b$, receive the back pressure of the steam and throw it npon the center, and form in fact four equal and distinct passages for the steam to the ports. The considerable area of the four ports and their united action produce an extreme degree of sensibility and a very slight turn of the valve varies the opening greatly. So rapid and perfect is its operation that it is difficult to detect a difference in its revolution, when suddenly changing from light to heavy labor of the engine, and vice versa.
It was patented April 13, 1858, by the inventor, T. S. La France, of Elmira N. Y., who will furnish any further information upon being addressed as La France \& Colman, of the same place.

## Wonders of Photography.

H. Garbanati, in an article on this subject in the American Journal of Photography, tells us the following:-
"I was recently handed two small pieces of glass, in the center of each was a dark object, about a quarter of an inch square. In the center of the square of one of these, by dint of close and painful examination, I discovered a speck about one-sixteenth of an inch diameter, which bore somewhat the resemblance to a portrait of a head. In the other was also a speck about one-eighth of an inch, and some other very minute specks in the one speck, but which I could not recognize as any particular objects. By holding the first piece of glass up to the light, and looking through a powerful magnifier, I discovered a perfect portrait of about a sixth size, and in the other a group of five equally perfect, of about half size. To what use might not this mode of photographing be put? In war the most elaborate instructions might be carried in a button or head of a pencil-case; and the general or secretary of war needs but a magnif ying glass to save the use of spies and men from hanging. The whole archives of a nation might be packed away in a snuff-
box. Had the art been known in the time of Omar, the destruction of the Alexandrian 1 brary would not have been a final loss."

## Scientific American.

## NEW YORK, JUNE 19, 1858.

A Good Chance for Inventors. Notwithstanding the thought expended and the ingenuity displayed by the inventors of our country toward the improvement of railroad cars, with a view of better adapting them to the comfort of the traveling community, there yet remain two objects for them to accomplish which are not only desirable to companies and travelers, but which are sure to bring to the inventor who is fortunate enough to successfully produce them a handsome in come. We allude to some system by which convenient and simple sleeping couches can be provided for night travel, and readily converted into ordinary seats during the day, and some contrivance for ventilating the cars, without admitting the clouds of dust that ne cessarily enter the cars when the windows are raised or opened.
These subjects have occupied the minds of many inventors for some time, and for several years past statements have gone the rounds of the press in praise of what were erroneously termed improvements for effecting both objects. The efforts of the numerous inventors whose attention they have occupied have not produced the desired effect in a satisfactory manner, although good has resulted from their labors. A few years ago a prize was offered for the best sleeping car by the late F. M. Ray, of this city, but among those exhibited there was not one which was deemed entitled to it.

In this country where we measure distance by thousands of miles, and think no more of a trip by rail from New York to St. Louis, nearly two thousand miles, than they think in Europe of a trip from London to Paris, about three hundred miles, it is with many persons an absolute necessity that the railroad companies should provide them with sleeping accommodations for the night, and in consequence we learn from the letters of our correspondents that there is at present quite an interest among inventors to produce a really good and convenient sleeping car.

We understand that a western railroad company have agreed to give one cent per mile for the use of an approved arrangement of sleeping couches on every car on their road to which it may be applied. This would y.ield an income to the successful inventor of $\$ 1,000$ per annum for each car, and as the road employs forty cars, would ensure to the inventor for the single road a tariff of $\$ 40,000$ per annum. Railroad companies would be justified in paying a liberal sum for the use of inventions for accomplishing these objects in the satisfactory manner desired, for the increase of travel that would follow their adoption would produce an extraordinary increase in the annual receipts of the company.
In case that any of our readers should wish to try their inventive powers on this subject, we will give them the points that are desirable to be remembered in the production of the present desideratum. The car must be simple in its construction, and the seats be capable of reversing as at present, and should be able to accommodate as many sleeping as sitting down; the less shelving the better, and strength combined with lightness are points to be recollected, and above all, rapidity of adjustment either from seats to beds, or vice versa, should be the end to be attained.

We have applied for patents for several improvements, but there is still room for further inventions on what are termed "sleeping cars," and we hope inventors will exert their energies in that line until the same facilities are offered for night traveling on railroads as are obtained on our river steamboats. Give us easy seats by day, and convert the seats into a state-room at night, and railroad traveling will then have reached a state of perfection in this country that will make American railroads far beyond those of any other country.

Extension of Patents by the Commissioner
Messrs. End by Congress.
ince an Editors-I noticed some weeks American that Charles in the Scientific for an extension of his india-rubber patent, and that the time for hearing had been fixed for some day during this month. I am interested in the result of this case, and have been anxiously watching for an expression of your opinion in reference to it, but not one word have you uttered for or against it up to this time. It was in your power to have defeated Goodyear's case if you had taken hold of it in earnest. I now fear it is too late. Why have you permitted this single important case of extension to progress wlthout opposition? I cannot understand your silence.
H.

New York, June 9, 1858.
[Our correspondent refers to the patent of Goodyear, issued on June 15th, 1844, for the principle feature in vulcanizing india-rubber. It embraces the "curing process," which consists in submitting prepared rubber to a high degree of heat, which preserves it from being affected afterwards by atmospheric and other influences, and yet sustains its elastic character. It is a very valuable patent; the process is essential to all the varied manufactures of this material. From the tone and language of our correspondent's letter, it is evident that he does not understand our position in regard to the extension of patents. In commenting upon his communication, we wish him (and all others who may hold similar views and opinions) to note particularly that there is a radical distinction in nature and in character between the extension of patents by the Commissioner, according to an established general law, and the extension of patents by special acts of Congress ; this case of Goodyear comes under the former classification. Our opinions in regard to all such questions are guided by general principtes, and have no reference what ever to persons $\sigma$ parties whose interests are likely to be affected by them.
By a general law of twenty-two years' standing-section 18, Patent Act 1836-a patentee may have his patent extended for seven years from the expiration of his first term, provided his invention is a useful one, and he has not been sufficiently remunerated for its use. To obtain an extension, he is required to show proof of the value of his invention, and the amount of remuneration he has received for its use ; and all those opposed to the extension are notified to appear, and show cause why it should not be granted. In such cases a fair hearing of both sides-those for, and those against the petition-is obtained, and the Commissioner of Patents, upon the testimony before him, adjudicates in the matter. As good citizens and just journalists we could not, therefore, consistently oppose the extension of Goodyear's patent, or any other person's patent, so long as the application is confined to a general law enacted to meet all such cases. To do so would be to act the part of obstructionists to the fulfilment of the law ; and it would also be passing judgment without a requisite knowledge of all the facts of the case. We consider that the Commissioner of Patents is the most competent person to pronounce judgment in such cases. He is sacredly obligated to dispense justice and maintain the law ; and as he has all the evidence of both sides before him he is certainly the best judge as to the right and wrong of granting or refusing such extensions. These brief remarks are sufficiently explanatory, and will, no doubt, be satisfactory to all who read them, in regard to our position of silence in cases coming up before the Commissioner of Patents for extension, according to an established law.
We have opposed the extension of patents by Congress upon general principles; and as we entered very freely into the reasons for so doing in the article on page 277, we will now add but a few words pertinent to this question.
Most of those patents sought to be extended by Congress have already had the benefit of
a seven years' extension, or their owners have
been well remunerated, and have been refused an extension upon a fair hearing before the Commissioner of Patents. Every bill enacted by Congress for the extension of a patent, is a new law, in every sense of the term, because it is a special act provided for a private person, and cannot be advocated on general.principles. To extend patents by acts of Congress to favored individuals is contrary to the spirit of our government; it involves class legislation, and creates invidious distinctions. All patentees are entitled to stand apon the same level in the eye of the law the rights of one are as sacred as those of another. Our course of conduct in regard to these questions is governed by motives which appear to us to be just, fair, and honorable. We have no personal feelings to gratify, and no private interests to subserve, in opposing the extension, of patents by Congress on the one hand, or in remaining silent in regard to those that come before the Commissioner, on the other.

## The Agricultural Division of the Patent

 office.Some newspapers whose editors were evidently in want of matter for their respective journals have been making a series of assaults on the agricultural division of the Patent Office, and directing their remarks chiefly against Mr. D. J. Browne, the conductor of that department, charging him with having sent persons to Europe at the government expense, complaining that the seeds were not properly distributed and condemning the agricultural reports. In consequence of this, the Chairman of the agricultural committee of the House of Representatives wrote to the Commissioner of Patents for an account of this department, requesting him to give an epitome of Mr. Browne's history and qualifications. Commissioner Holt replies in one of those elegant, elaborate and yet concise reports for which he has already become noted, and gives such information as clearly satisfied the commintee that the charges were false and the assauits unworthy and unprovoked. The Washington Union printed this report, and from it we gain the following information.
By means of this department many new and valuable seeds, plants and cuttings have been sent to all parts of the country, where seed stores were inaccessible, and thus the farmer who tills the ground that forms the outskirts of civilization, has an equal chance with, and can produce the same varieties of vegetables and fruits as the farmer who cultivates the soil closer to the busy haunts of man. Again, there are many plants, such as the Brassica tribes, the cabbages and turnips, for example, which deteriorate in this climate, they ripen and grow too fast, the insect attacks the leaves, and thus the plant becomes daily more coarse, and the seed loses power and health, while in Europe they attain perfection, few insects attack them, and as there are more people for a given amount oflabor, more attention is paid to their cultivation. This department, then, actually blesses our land by superintending the importation and distribution of fresh seed which will tend to improve our own varieties.
The Commissioner takes the opportunity to make some suggestions for improving the distribution, but states that at present "the utmost care is exercised to secure accuracy, justice, and dispatch in these important duties,' and his only complaint is that he has not sufficient to supply the demand.
Of the Agricultural Report he speaks highly and thinks it of great importance, but on this point we have our own opinion which we have not hesitated frequently to express.
The testimonial which Commissioner Hol pays to the scientific attainments of Mr . Browne, shows him to be notonly exactly "the right man in the right place," but also a gentleman whose knowledge of agriculture is the result of actual experience on farms or plantations, and he has gained his information as a scientific explorer in nearly all parts of the world, as a railway and canal engineer, as a chemist working in his laboratory, as an au-
thor in his study, as an editor in his sanctum,
ever having at heart the improvement of agriculture in America. It is therefore a credit to the nation to have such a man in the position which he holds, and the position is a proper reward for his valuable services in the cause of practical science.
Goodyear's India Rubber Extension Case.
Messrs. Editors.-The important Goodyear's vulcanized india rubber extension case has been progressing at the Patent Office this week. The patent of Chas. Gondyear for vulcanized gum elastic, dated June 15, 1844, expires on the 15 th of this month, unless the Commissioner grants an extension of seven years before the expiration of that date.
This patent of Goodyear's consists in treating rubber with sulphur and heat. The friends or licensees of Goodyear have put forth the most strenuous efforts to obtain an extension of this patent, and the public has also been actively engaged in opposing the extension.
The Examiner, Dr. Thos. Antisell, who has the case in charge, after an immense amount of labor, has presented a very able and elaborate report in the matter. It shows that Chas. Goodyear has personally received $\$ 114$, 000 profit from the vulcanizing patent alone, and after pointing out that great discrepancies existed in the account furnished by Mr. Goodyear in his petition, it recommends that perhaps the extension had better be granted, as it seems hard to send such a man of genius into the world penniless at the age of 58 , who has done so much for the encouragement of the arts. It is also alleged by Mr. Goodyear, in his petition, that he is poor and in very feeble health.
Messrs. Blatchford and Brady, eminent lawyers from New York, are counsel for Goodyear, and Stoughton, Greenough, Stansbury, and others, counsel for the American and European public.

The case in behalf of the latter was very ably argued by Mr. Stoughton of New York, and in behalf of Goodyear by Mr. Brady, in a very learned and dignified manuer.

The case will be decided by- the Commissioner before the 15 th inst., and doubtless a just decision will be tendered, as he is fully qualified to decide in a matter of this magnitude. It is alleged that millions of money hang on this case.
Mr. Goodyear is certainly a man of genius, as the hundred different applications of his invention now on exhibition in the gallery of the Patent Office abundantly testify; among which may be seen almost every kind of stationary articles, carpetings, tents, awnings, coverings, spreads; house, ship, and camp utensils; packing, sheathing, and caulkings; valves, stops, springs, wearing apparel, life preservers, beds, combs ; surgical, medical, and philosophical instruments, and a host of other things too numerous to mention.
Washington, June 11, 1858.
[Our correspondent will notice in another place an article bearing upon the extension of patents by the Commissioner. This is, undoubtedly, a very important case, of which fact, no doubt, the Commissioner is fully impressed. It strikes us as somewhat queer that if Goodyear has received $\$ 114,000$ for the vulcanizing patent alone, he should now appear before the Patent Office "penniless at the age of fifty-eight." We shall be able to give the decision in the case next week.
Dr. James Dean died on the 9th inst., at his residence in Greenfield, Mass. He was distinguished as a geologist, and was engaged on a work relating to the bird-tracks in the sandstone of the Connecticut valley, at the time of his decease. It was to be published by the Smithsonian Institution.

Propeller steamships appear to be fast superseding paddle wheel vessels, both in regard to peed and economy. Those running on the Atlantic make quicker voyages in proportion to their tunnage than the crack steamers of the Cunard line.

## Burning of the Dead.

It will be remembered that, some two years ago, the public mind was horrified by an attempt that was made in one of our western cities, on the part of a husband, to burn the body of his deceased wife. After the excitement had in some degree passed away, the subject was discussed by some of our city journals in a very calm and instructive manner; and it has since received considerable attention from some English physicians. We are not prepared to advocate the burning of the dead, or to dispense with that time-honored system of burial which has obtained in all Christian communities since the days of Abraham; but we consider it a very proper subject for discussion, and could it be proved, in a sanitary point of view, to obviate a more serious evil, we could become reconciled to what is now chiefly regarded as an inhuman relic of a barbarous people. We, however, differ in opinion from those who undertake to show that disease is propagated from the exhalations of graveyards, in cases where they are properly cared for. So far as our own country is concerned, we believe not a single fact can be adduced in support of such an assertion, unless it result from the inhuman disposal of the remains of outcasts in what are known as "Potter's Fields," and which are of ttimes hustled about in premature resurrection by the Vandalism of unprincipled moneygetters. The whole evil complained of in European cities, if not purely imaginary, arises from that system of intermural burial which is now nearly dispensed with in all civilized cities.
The Evening Post, of this city, notices that a book has lately been published in London, which seeks to show the advantages of the ancient method of burning the dead. The
only objection its author, who is a "Member of the College of Surgeons," finds against burial is a sanitary one. He says that "it is proved beyond all doubt, that during the progress of that decomposition which a body undergoes when buried, the elements of which it is composed, before entering into other and purer states, forms certain putrid gases of so deadly a nature that their inhalation in a concentrated state has been known to cause instant death; while in a more diluted form, they are productive of the most serious injury to health. These dreadful effluvia vary much in their virulence, according to circumstances; and there is probably one particular stage of decomposition in which they attain their most fatal power."

Church-yards,are, it is well-known, most pestiferous places. And we are assured that the gases emanating from the bodies when diluted, possesses the power of "producing various diseases, diminishing the average duration of life, lowering the tone of the general health, and thereby rendering thousands more liable to be attacked by fever, cholera, or other epidemics. It is not because they are often imperceptible to the sense of smell that they are harmless."
How are these evils to be averted? Thirtyfive millions of human beings die every year -nearly four thousand every hour. By what means shall this great mass of decaying substance be so disposed as not to vitiate the air the living breathe, and the water the living drink? The remedy our author proposes is, as we have hinted, that of burning. To render the idea less revolting, he proposes a plan der the idea less revolting, he proposes a
which seems to him without objection:-
"On a gentle eminence, surrounded by
pleasant grounds, stands a convenient, wellpleasant grounds, stands a convenient, wellventilated chapel, with a high spire or steeple. At the entrance, where some of the mourners might prefer to take leave of the body, are chambers for their accommodation. Within the edifice are seats for those who follow the remains to the last; there is also an organ
and a gallery for choristers. In the center of and a gallery for choristers. In the center of
the chapel, embellished with appropriate emblems and devices, is erected a shrine of marble, somewhat like those which caver the
ashes of the great and mighty in our old caashes of the great and mighty in our old ca-
thedrals, the openings being filled with pre-
pared glass. Within this-a sufficient space intervening-is an inner shrine, covered with bright, non-radiating metal, and within this again is a covered sarcophagus of tempered fire-clay, with one or more longitudinal slits near the top, extending its whole length. As soon as the body is deposed therein, sheets of flame at an immensely high temperature rush through the long apertures from end to end, and, acting as a combination of a modified oxy-hydrogen blow-pipe with the reverberatory furnace, utterly and completely consume and decompose the body in an incredibly short space of time; even the large quantity of water it contains is decomposed by the exwater it contains is decomposed by the ex-
treme heat, and its elements, instead of retarding, aid combustion, as is the case in fierce conflagrations. The gaseous products of combustion are conveyed away by flues, and means being adopted to consume anything like smoke, all that is observed from the outside is occasionally a quivering transparent ether floating away from the high steeple to mingle with the atmosphere."

Saleratus and Cream of Tartar in Bread.
A long article on the above subject was copied from the Portsmouth (N. H.) Journal into the New York Tribune of the 1st instant. Its author subscribes himself A. Baker, and his object is to prove that the use of saleratus and cream of tartar in bread and pastry is the cause of the bad teeth so common in our country, and that it is also a fruitful source of disease and premature death. He quotes the statement of Dr. Alcott to prove that 300,000 die annually from the use of saleratus; and he states that in Portsmouth alone 50,198 pounds of saleratus and 15,100 pounds of cream of tartar are sold annually in a population of only 10,000 persons. From these statistics, it seems, that every inhabitant of that city consumes five pounds of saleratus and one and a half pounds of cream of tartar yearly. If these statistics are correct, (but we apprehend they are greatly exaggerated, there must be a sour set of inhabitants in Portsmouth Mr $_{2}$. Baker states that Europeans have much better teeth than Americans, and all because the former do not use saleratus in food. He also states that the early settlers of our country and their descendants had good teeth until about fifty years since when the use of saleratus commenced.
The object of Mr. Baker, we have no doubt, is a well meant desire to correct what he considers a national evil, but if he is not correct as to the cause of early decay in teeth, he will do injury rather than good, in thus directing attention to the wrong source of an evil. We are convinced that Dr. Alcott makes sweeping charges which cannot be substantiated against salaratus, in attributing so many premature deaths to its use. It is a well-known fact that there are many families
in our country in which neither saleratus nor in our country in which neither saleratus nor
cream of tartar are employed, and who have no better teeth than others in which these substances are used. We are acquainted with cases of this kind ourselves. An immoderate use of saleratus and cream of tartar in bread must be injurious, as is the immoderate use of any substance in food, but as Mr. Baker asserts that the teeth of the Parisians are excellent, it is evident that he overshoots the mark in his onslaught on saleratus and cream tar tar by our people. When cream of tar ing, the tartaric acid of the cream of tartar unites with the potash of the saleratus, forming the neutral tartarate of potash, while carbonic acid gas is liberated, and raises or lightens the bread. Now, if the tartarate of potash is a and if it is the cause of the early decay of American teeth, why does it not produce the same effects upon the teeth of the people of
France, when there is so much tartarate of potash in their wine. Our people eat, the French drink the tartarate, and what is the difference? If it is such an evil in America, it ought to be as great in France. All vine
them ; this is argil or tartarate of potash precipitated from the juice of the grape. The wine-drinking people of France consume far more tartarate of potash annually than the the bread-eating people of Portsmouth. The small amount of saleratus used in bread-baking, we are confident, is not the cause of early decay in the teeth of our people. Some other cause must be hunted up.

## Sulphurous Acid.

The application of this acid to manufactures has been much impeded by the difficulty which the preparation of its solution presents on a large scale; for the production of sulphurous
acid, as given in books, is always dangerous, especially when its solution has to be prepared in large quantities. This difficulty I have overcome by a process which I here give to the public, and which enables me to prepare thousands of gallons per day of a saturated solution. The process consists in burning sulphur in a small furnace, and conducting the acid gas through earthenware tubes, surrounded with water, so as to cool them. It is then made to ascend through a wooden column, forty feet high, and about four feet wide, filled with pumice-stone, which has been previously washed with muriatic acid, and then with water. Whilst the acid ascends through the porous pumice-stone, it meets a certain and known quantity of water descending, which dissolves the acid. By opening, more or less, a valve at the top of the column, a more or less rapid current is established. With a little care, a saturated solution runs out constantly from the bottom of the column into a confined reservoir, in which it is stored for use until required.
I was led to contrive the above process from a wish to use sulphurous acid in sugarrefining, convinced that it would be far superior to the sulphate of lime (which was so strongly recommended a few years ago by M. Dumas and M. Melseus), because, that by its volatility, it would not remain in the syrups or molasses, and give them, as the sulphate does, a disagreeable taste, in consequence of the lime of the sulphate remaining in the syrup as acetate or lactate. These anticipations were not only realized, but I also found that sulphurous acid possesses two advantages for the sugar refiner: First, that it stops the fermentation of his hot liquors as they come out of the filters; and secondly, when properly applied, it tends to prevent the re-coloration of the liquors during their concentration in the vacuum pan. In practice I found that very successful results were obtained by adding two gallons of a saturated solution of sulphurous acid to every one hundred gallons of decolorized liquor, as it left the char-flter, and was collected in tanks, until pumped up or run into the vacuum pan.-Professor $F$. Grace Calvert.

The Erration of Man's Lite.-A New Idea.
A work has recently been published by M. Flourens, the celebrated French physiologist, in which he asserts that the natural length of a man's life is five times as long as the period of growth, and assuming that the latter is twenty years, concludes that the destined pilgrimage of man on earth is one hundred ears
From his own observations, and facts derived from the observations of Buffon, and from natural history, he believes that the proportionate length of life in animals to their periods of growth is established, and now claims to have discovered the peculiar physical change in the system of both animals and men which indicates the completion of growth. "It consists," says M. Flourens, "in the union of the bones to the epiphyses. As long as the bones are not united to their epiphyses, the animal grows. In man the same effect takes place at twenty, and consequently the duration of man's life is five times twenty. It is now fifteen years since I commenced researches into the physiological law of the duration of life, both in man and in some of our domestic animals, and I have arrived at the result that the normal duration of man's life
is one century. Yes, a century's life is what Providence meant to give us."
M. Flourens brings some striking and interesting facts forward, to prove the truth of this theory as applied to domestic animals, and claims that it has an exemplification in the relative duration of growth and life in the camel, horse, ox, dog, and other domestic animals. In dividing the several periods of man's life, M. Flourens prolongs the duration of infancy up to ten years, because it is from nine to ten that second dentition terminates; adolescence up to twenty, because it is at that age the development of the bones ceases ; of youth, up to the age of forty, because it is only at that age that the increase of the body in bulk terminates. "After forty," he says, "the body does not grow, properly speaking the aus entation of its volume which then takes place is not a veritable organic development, but a simple accumulation of fat. After the growth, or, more exactly speaking the development in length and bulk has terminated, man enters into what may be termed the period of invigoration-that is, when all his parts become more complete and firm, and the whole organism more perfect. This period lasts to sixty-five or seventy years, and then begins old age, which lasts for thirty years."
Although we cannot entirely agree with the theory of M. Flourens, that with corrected manners, passions, and habits, the life of man can be prolonged to the lengthened period he mentions, we yet think that with the good conduct he recommends, moderate labor, study, and a systematic course of living, it may not only be extended, but its evening may be sustained in beauty and vigor until night has entirely set in.

What shall we do About Prizes?
Within the past four years we have distributed the sum of $\$ 3,700$, in prizes for the largest lists of subscribers furnished according to certain prescribed limits. Previous to entering upon this system of a warding prizes, we depended principally on tried friends and canvassing agents to keep the circulation of the Scientific American upon a steadily increasing basis. We have never been disappointed in our friends, but we were cheated, and the publre were swindled, by a few unprincipled agents who took money for our paper and never remitted it to us. To save ourselves from suspicion, and the public from being wronged we renounced the system and resorted to one of offering prizes, which has been thus far most satisfactory. Within the next six weeks we must arrange our plans for the new volume which will begin on Sept. 11. We are anxious that the circulation of the Scientific American should be largely increased, and we wish to secure this object in the best and most unexceptionable manner. We are now engaged in maturing some plan for the campaign, and we present this brief statement for the purpose of eliciting an expression of opinion from our subscribers. We would like to receive an immediate response in writing from all those who propose to enter the field of competition, in case we should offer prizes upon about the same scale of last year, ranging in sums from $\$ 20$ to $\$ 300$. If these responses are promptly made and are of an encouraging nature, we shall announce within a few weeks a list so that all may begin the competition in good time to commence the next volume. The yearly subscription on all clubs above 20 names will be only $\$ 140$.
Mists.-The formation of mists never takes place if the temperature of the water be lower than that of the atmosphere; but when the cold air above the land mixes with the warmer air above the water, mist or fog will be the result, which will be so much the greater in quantity as the land surrounding the water is higher and deeper. It is by the deposition of water from the atmosphere, through the operation of this law, that the mountains and plains in hot climates are covered with and plains in hot cli
verdure and fertility.

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C. G. W., of La.-You cannot procure a patent for making signs of glass. They are use $y$ in this city.
cell is similar in its action to the galvanic cell, but it is a mere supposition. The brown precipitate formed by
immersing a zinc plate in a solution of blue vitriol is immersing a zinc plate
sub-sulphate of copper.
sub-sulphate of copper.
J. . M.. of N. Y.-The composition you mention for
brass fixtures is brass fixtures is lacquer. It is made with shellac dissolved in alcohol, and colored yellow with tumeric. B. B., of Ohio.-It is our opinion that the white lead
and not the turpentine is the cause of painter's colic in painting with lead pigments. A portion of the lead may evaporate with the turpentine, and be inhaled by the painter; this action has been suggested.
A. S. W., of N. Y.-A steam boiler about as much water under sixty pounds pressure as under atmospheric pressure. If your boiler evaporates nine cubic feet of water per hour, it is nine horse power.
J. H., of Ala. condensed air into it. Dr. Gorrie applied refrigerating liquids for absorbing the heat from water to produce ice
in his machine, As far as we have been able to obtain accurate information, no profitable ice-making ma-
chinery has hitherto been constructed. You may yet become the successful inventor.
J. R. M. of -. You have given us no data for calcu-
lating the quantity lating the quantity of water which falls per minute
therefore we cannot tell you the horse power of your water fall. State your question correctly, and we wlll answer it.
L. A., of N. Y.-We have had a host of communica-
tions on the gyroscope. none containing anything of tions on the gyroscope. none containing anything of
practical usefulness. We are acquainted with all th xperiments related in your letter.
B. M., of N. Y.-Practically we know that water
wheels do more work, and furnaces draw better during night than day, but we have not yet satisfied ourselve as to the reason why. Water will flow asfast over a nine foot as over a twelve foot fall.
H. G. W., of N. Y.-We understand that pipes are used upon several lake boats for carrying steam from boilers into the holds of the vessels for extinguishing
fires. This method has been recommended as a safety adjunct by the supervising inspectors of steamboats
The idea of employing steam for extinguishing fires is old and well known.
S. A., of Iowa.- Mere static pressure cannot raise water in tubes, as you suppose. As there are 6.26 libs.
of water in an inch tube 20 feet high, the total pressure of water in an inch tube 20 feet high, the total pressure
of 3 lbs. on a piston in a four foot stroke pump making 40 strokes per minute, will raise water 20 feet high through the tube, and discharge its whole contents eight times every minute.
E. A. D., of N. Y.-You cannot successfully heat wa-
ter in a vat by placing the steam pipe upon its surface. Water will not conduct heat downwards; so that if you wish to accomplish your object, you should place the when applied to an engine, is a casing filled with steam for keeping the steam in the interior of the cylinder hot. It is known to be an economizer of fuel. Watt
discarded it for a while, but resumed its use again for the above reason.
J. W. S., of Ohio.-You are mistaken in supposing that telegraph companies could not use several wires
twisted together for conductors, on account of their too great conducting powers. They have found that when one wire can do the work it is absurd to use more, just as it would be an erroneous policy to build and use three or four tracks of railroad to do work that can easily be accomplished on a single track. A lightning
rod is efficient according to its solid section; this is the opinion of Professor Faraday.
S. \& M., of Ky.-If you own a town, county, or Stat right in a patented invention, and any one should in troduce the same improvement within your territorial limits, he is liable to you for damages, and you can sue the purchaser of a patent right to a specific locality could be interfered with by the mere introduction of the invention from some other market, and have no remedy.
G. H.
G. H., of Del.-Constructing diaphragm pumps in not, theref ore, patertable.
S. U. S, of Ill.-By taking a common pencil,都 much of its length is necessary to cover the figure of a
man at any known distances, say one hundred and tw hundred yards, and then cutting notches in the pencil at the exact points, you will be able at any time, by this simple means, to approximate closely to the distance a
person may be from you. A knowledge of this simple person may pere of service in many cases. We know nothing of a bass viol operated by horse-power. It must be a curious affair.
J. C. C., of Tenn.-We have never published an en-
graving of Halsted's turn-table. Wm. Howe has had three patents granted to him on bridges. Two were issued in 1840 , and have expired, and one was granted
1846, and willnot expire, therefore, untill 1860 . C. C of Pa Model tent to us without the the inventor attached, are liable to be mislaid and forgotten. The law requires the applicant's name to be put on his model.
W. W., of N. J.
While it stands idle, introduce some of oiler from rusting While it stands idle, introduce some oil into it just be-
fore it is stopped, and then run off all the water. A F. G. S., of Mass.-Build your small boiler of a cylF. G. S., of Mass.-Build your small boiler of a cyl-
inder form, like that of a locomotive. Insert the steam
pipe into its top when you have no dome. The power
of an engine does not depend on the length of its stroke, but the pressure of steam, and the velocity and area of the piston. Cement for cast iron is composed of twent pounds of iron filings, one ounce of sal ammoniac, an half an ounce of the flower of sulphur, madeinto a paste ith water.
Money received at the Scientific American Office on account of Patent Office business, for the week ending L.
L. H.. of La., $\$ 24$; J. R., of Ohio, $\$ 25$ : U. T. S., of Lenn., $\$ 30$; T. G. Y., of N. Y., $\$ 25$; G. W. S., of Ill.,
$\$ 30$; J. H. Q., of Mich., $\$ 24 ;$ A.S. L., of N. Y., $\$ 100$ Ala., $\$ 30$; G. W., $\$ 30$. W., of N. Y., of Me., $\$ 55$; R. H. C., of
, E. B., of Mo., $\$ 30$; F. M., of Ill., $\$ 30 ;$ W. H, B., of N. Y., $\$ 55$; A. D., of
Mich., $\$ 25 ;$ J. A. A., of Texas, $\$ 30 ;$ B. \& P., of Mass.,
 N. Y., $\$ 45$; S. B. S., of Mo., $\$ 30$; P. M., of Ill., $\$ 30$
J. W., of L. I., $\$ 30$; M. D., of Conn., $\$ 250 ;$ O. D. W., of N. Y., $\$ 25$; G. F. D., of Pa., $\$ 30$; W. S., of Mo.,
10 ; J. D., of Ohio, $\$ 20$; W. W. H., of Texas, $\$ 30$ $\$ 10 ;$ J. D., of Ohio, $\$ 20$; W. W. H., of Texas, $\$ 30$.
Specifications and drawings belonging to parties with he following initials have been forwarded to the Pat 12, 1858 :J. R., of Ohio ; L. H., of La. ; J. H. B., of R. I. ; E
B., of Mo. ; F. B, N., of N. Y. ; J. H. Q., of Mich.; T. G. Y., of N. Y. ; J. L. S., of Tenn. ; A. D., of Mich.
T. E. McN., of Pa. ; O. D. W., of N. Y.; W. H. B., o
.
 of Mass., ( 3 cases); T. E. P., of N. Y.

## TROW's New Yort Cry Directory, Compiled by H. Wilson. We have just received this valuable Direc

 H. Wilson. We have just received this valuabie Directory for the yearr $1888-9$, containing 199.804 names , al
of which have been collected, arranged, printed an bound in one month. To praise a Directory would in
deed be a work of supererogation as its value and use
fulness are appreciated by every one. It is publishe fulness are appreciated by every one, It is published
by J. F. Trow, 377 and 379 Broadway, New York, for
$\$ 250$. WILson's Busingss Dirzctory for 1858-9-published
by J. Trow-contains the names and addresses of all sective occupations. The price is only $\$ 1$, and no of
fice or this city, classifed under their re american Veutrrinary Journal-G. H. Dadd, V. S. Borton, Mon all subiects reataing to the veterinary ant
formation the treatment of cattle generally is so cheap (onl
and the and the treatment of cattle generally, is so cheap (only
$\$ 1$ per annum) that the owner of any quadruped. equine
or bovine, must really be neglecting his own interest \$1 per annum) that
or bovine, must reall
if does not take it.
The Ambrotype. By Chas. Seeley, A. M. This
practicallittle treatise upon the art of producing collo-
dion positives has attained a second edition. It is dion positives has attained a second edition. It is
very complete and correct manual, and should bein the Tug MusicAL Wordo-R. S. Willis. Ecitor-The
number for this week contains a biautiful piece
music, by R. Goldbeck, composed to the words, "Le music, by R. Goldbeck, composed to the words, "Le
me Weep, Hy Anna Freeman, It is also full of inter
esting matter for the home circle or the desultory houl
The American Journal or Photography-Publigh
ed at 424 Broadway, ${ }^{\text {New }}$ York-This periodical has just commenced a new series, and there are many im
provents with the new. volume. It is an excellent
magazine and very cheap. The Eclectio Medioal Jourval-Published by $R$ tains some excellent articles upon medical subjects and
hyyiene, all, howevert treated according to the theories
of the so-called eclectic school.

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C ORLISSO, PATFNT STEAM ENVINES-







## Sirince and Art.

## The Loss of the Ava. The following remarks and sketch, explana-

 tory of the manner in* which the Ava was lost, are taken from a new scientific journal published at Calcutta, entitled The Engineer's Journal and Railway Chronicle:-"We give below a rough sketch, kindly sent us by a correspondent, illustrative of the manner in which the P . and O . Company's steamer $A v a$ was lost. After striking on the rocks, she appears to have broken her back amidships, and then to have gone down.

The rock on which she struck is between Pigeon Island and the mainland, about nine miles north of Trincomalee. It is reported that a fishing light was mistaken for the harbor light, which might easily have been the case, because the latter is a disgrace to the fine harbor, the entrance to which it is intended to show.
The Ava had on board the only shaft in India that would fit the Alma. The lastnamed vessel, therefore, will have to wait until a new shaft is ordered, made, and can be sent out from England.
The passengers, as our readers are doubtless aware, were all saved, but suffered severe privations. Among them were several refugees, and, we believe, some of the Lucknow garrison. The greater papt-of the mails and garrison. The greater part of the mails and In addition to a very valuable cargo there was upwards of $£ 266,000$ in specie on board. There is evidently no reason why, with a pro-

per diving apparatus, a large amount, if not all, of the specie should not be recovered. The precise spot where the vessel went down is well-known, and there is apparently no difficulty in the matter. The Peninsular and Oriental Company will certainly be very unwise to abandon the wreck without an attempt of some kind being made. If it is abandoned, it will turn out a most profitable speculation to those who embark in recovering it."
Late advices speak not only of the shaft of the Alma, said to be worth from $£ 2,000$ to $£ 3,000$, being recovered, but also of several boxes of specie. When the last accounts left the wreck, the work of recovery was going merrily on, and there appeared eyery reason to hope that the valuable part of her cargo would be saved.-London Engineer.

## The improvement in the mills.

The improvement in the millstone dress which is illustrated in the accompanying engraving is the invention of Gabriel Natcher, of Indianapolis, Ind., and two patents were granted to him April 27, 1858, for his invention, one for the dress and the other for the tool which he employs to cut the stone.

The whole of the face of the stone being polished as smooth as possible, the tool which we will now describe is used. It is composed of one or more diamonds, inserted in a,handle, and when two or more are used they are to be firmly set in a row at equal distances apart. The crack or grinding surface is commenced at $A$. The furrows or cracks, $A$ and $B$, are produced by running the diamonds over the face of the stone by the side of a straight ruler. The curved lines, as represented at $C$, are made by operating the diamond by the the side of a curved ruler. The width of the space separating the lines upon the grinding surface of the stone is regulated by holding the points more or less diagonally across the line of motion. 1n the usual mode of dress-
ing stones, a pick is used, which being brought down upon the face of the stone produces the stellated fracture, thereby weakening the stone as far as the fracture extends. Thus the edges of the cracks weakened by the blow from the pick soon crumble away, wearing the face of the stone as the particles thus detached are thrown oat. All these disadvantages are entirely prevented by this mode of dress.


The line cut by the diamond upon a glossy surface which has never been disintegrated by a blow from a pick is clear and distinct, having its edges sharp and fine with no dispositien to crumble, the cohesion being perfect up to the edge of the crack, thereby insuring a sharp corner or cutting edge perfectly straight and equal. The stone will be more perfect when dressed again upon this plan, as the diamond gets below the bruises occasioned by the old mode of dressing with a pick. The furrow is smooth, having the side upon which the grain rises a regular inelined plane. The passage of the grain to the face is uniformly checked by the lines at A, where the bran is taken off. As there is no crushing contact of the stone with the wheat, the sharp edges of cracks or small lines cutting or shaving up the grain, while no roughness or inequality is allowed although brought close together.
The flour comes from the stone with all its nutrition, as the stones run very olose; scraping the bran clean without cutting it up. There is no perceptible moisture generated in the operation of grinding by this mode, and the spouts are clean and dry, because the grain is moved to the eye by the retarding curved lines until well ground, and while the motion is less rapid, and consequently less liable to heat, the pressure being the same, when, having reached the extreme of the breast-circle, it is rapidly thrown from the stone, finding few or no irregularities to retard its progress.
The inventor has sold half his interest to A. P. Orton, of the same city, from either of whom further particulars can be obtained.

## Drawing Iron.

When a bar of wrought iron is broken by a weight being placed upon it, it is supposed by many persons that the remaining parts are rendered weaker than they were before, on account of the strain to which they have been
subjected. This is a mistaken idea. Such pieces of iron bars are generally stronger, according to their diameter, than they were before the bar was broken. The strain to which they have been subjected, by drawing the fibers closer together, increases their density, and, as a consequence, the strength of the metal. A wire of one-eight of an inch in thickness is, proportionably, stronger than one twice the thickness, simply because its fibres drawing.

## The British Post Offce.

From the report of the Postmaster General of Great Britain, as published in Hunt's Merchant's Magazine, we cull the following in-formation:-Since the improvement of the letter delivery system, there has been a free delivery of 300,000 letters per week or about sixteen millions a year. In London alone, the number of places where letters can be pogted has been increased by the addition of sixty new receiving houses and sixty-six letter
pillars-cast iron columns set up in the street, from which letters afe collected. From 1840 to the present time, the net annual evenue has increased three and a half times expenses have only doubled, being for the past year $\$ 8,604,075$, and the amount of money transmitted through the Post Office in the shape of money orders was $\$ 60,901,365$. All this is due to the energy and genius of one man-Rowland Hill.

## Douglass' Railroad Car Spring.

This invention relates to springs of the description known as "elliptic," and consists in a novel mode of constructing and combining the upper and lower plates of the spring, whereby greater strength is obtained with a less weight of metal than is required in springs of the usual construction.
In our engravings, Fig. 1 represents this improved spring as adapted to railroad cars; Fig. 2 is a side elevation of the same, modified and applied to a locomotive truck; and Fig. 3 is a side view of a double elliptic spring, constructed upon the same improved plan, and designed for ordinary carriages.
The ends of the upper leaf, $A$, of the spring, are bent around bolts, B, secured in jaws attached to the truck, C , of railroad cars, or to jointed bars, I J , on which is suspeñded the truck of the locomotive, and the lower leaves, E, which are made of different lengths, in the same manner as the common elliptic springs are made, of a more rounding curve, so as to leave the space between the center of the upper and longest leaf, and corresponding part
ly, and serve to give great strength. to the spring.
Springs constructed on this plan have been in operation on the heaviest tenders on the Delaware and Lackawanna Railroad for a year past, and they are found to be capable of sustaining a far greater pressure with an equal degree of elasticity, and a saving of at least twenty per cent of steel, than the ordinary construction of springs.
This excellent form of spring was patented December 29, 1857. Any further information can be obtained by addressing the inventor, George Douglass, Scranton, Luzerne county, Pa .

Habits of Grasshoppers.
A Goliad correspondent of the Colorado (Texas) Citizen gives some curious facts in relation to the grasshoppers which have recently swarmed in that region. He says :-
"They have an especial fondness for wheat and cotton, but don't take so kindly to corn. The only vegetable, they spare is the pumpkin. The most deadly poisons have had no effect upon them; fumes of sulphur they rather like than otherwise; musquito nets they devour greedily ; clothes hung out to dry they esteem a rarity; blankets and gunnybags they don't appear to fancy. They swim the broadest creeks in safety, sun themselves awhile, and then go on. The whole mass appear to start and move at the same time, traveling for an hour or two, devouring everything in their way, and then suddenly cease, and not move perhaps for a week, during which time no feeding is noticed; and finally, they carefully avoid the sea-coast."

of the leaf, A, when they are arranged below the same, with the ends of the upper longest leaf sprung in between, and arranged against, the rounded ends, $B$, of the leaf, $A$. The leaves, A E, are held in their places during their elastic movements over each other.by the usual clips, near the ends of the lower ones, and by right-angled jaws, F, between which they are placed, which jaws are secured to the journal boxes, G, arranged between the guides, D, secured to the truck of the car or locomotive. When this plan of spring is employed for ordinary carriages, the leaves, $a b$, are arranged in the relation together represented in Fig. 3, and are connected together by joint pins at $c$.
It will be seen that the spring is supported at the center of the lower leaves, $E$, and receives the weight of the car or other object at or near the ends of the upper leaf, A. The tendency of the weight thus applied is to cause the plates, E , to be straightened, and this tendency exerts a tension in a nearly this tendency exerts a tension in a nearly
longitudinal direction on the plates, $\mathrm{A} a$, so that while the plates, E b, yield considerably in the direction of the pressure, the plates, A
$a$, though sufficiently elastic, yield but slight-


INVENTORS, MANUFACTURERS, AND FARMERS.

## THIRTEENTH YEAR:

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