"IDEAL" AUTOMATIC LOOM

THE
STAFFORD COMPANY
READVILLE · MASS.

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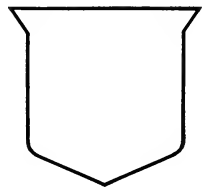


The Stafford Company

READVILLE, MASS.

AUTOMATIC LOOM

THE "Ideal" automatic loom stands absolutely in a class by itself. Its mechanical principles are unique and the patents protecting them are basic and unassailable. Every movement of the loom is smooth and thoroughly mechanical; in design and construction it combines simplicity and strength; its durability and freedom from breakages and capacity for high percentages of production are recognized, and its ability to weave the highest grade of cloth ever produced upon an automatic loom is now generally admitted, and it is the only automatic loom ever constructed that can use cops or bobbins interchangeably.

In a word it is a strictly practical machine, built by practical men for practical users, and the thousands installed within the few years of its existence and the results obtained by the mills operating them, together with the fact that nearly every mill has placed repeat orders, are incontestable evidence of the validity of the claims made for this loom.

The success of the "Ideal" loom is due not solely to its automatic features, but in a great measure to the loom itself.

Previous to the advent of the "Ideal" the scope of an automatic weft changing loom was limited and maintenance expensive. This was due largely to the fact that attention had been concentrated on the development of the automatic mechanism instead of the loom itself, or in other words, the weaving mechanism was made of secondary importance.

The policy of this Company has been just the reverse of the above. Its first efforts were directed entirely towards

the perfection of the highest grade plain cotton loom which could be constructed, capable of weaving the widest range and best quality of cloth, and its fullest energies were bent in this direction until the now universally known Stafford plain cotton loom had been thoroughly introduced.

With the foundation, or "weaving mechanism," perfected, the automatic features were next taken up with the same care and thoroughness. The end in view was the production of a simple, strong and durable device which would in no way interfere with the weaving features of the loom, but, retaining all the properties of the plain cotton loom, would perform motion for motion, without the slightest jar or strain, the work of a weaver in replacing the spent shuttle with a fresh one and restarting the loom. This result was successfully accomplished by the use of important and entirely new features which render the weaving and weft replenishing features of the loom entirely distinct and independent one from the other and preclude the possibility of their ever being in operation at the same time.

The "Ideal" automatic loom differs from any other in that it changes the shuttle when the filling runs out or breaks, the change being effected when the loom is stopped. The reserve supply of shuttles is kept in a magazine attached to the breast beam; the filling fork indicates the absence of weft in the usual way and the loom stops with the shuttle in the box at the magazine end. The empty shuttle is then ejected into the catcher box, a fresh shuttle carried (not thrust) from the magazine and placed in the lay and the loom restarts weaving exactly the same as though controlled by a weaver operating a plain loom. Sufficient time being taken to eliminate sudden and violent movements, the change of shuttles is effected without any strain on the loom or the automatic mechanism and danger of breakages of bobbins, castings, shuttles or injury to the warp or filling is entirely done away with.

The loom is equipped with a mechanical warp stop motion of simple design, positive and immediate in its action.

Each end of warp is control'ed by one drop wire and is so arranged that on the breaking of a warp end the loom stops, rendering it necessary for the weaver to piece the broken end before the loom can be restarted.

As the "Ideal" loom is simply a high grade plain loom to which has been attached an ingenious and simple device which automatically changes the shuttle, it is suitable for practically every class of goods that is woven on a plain loom and can be changed over from one fabric to another as readily as any other plain loom. Some of the various styles of looms that we build are shown on the pages following.

The construction of our looms, both in material and workmanship is of the best and is manifestly superior to anything heretofore seen in loom manufacture. We have invested a large amount of money in equipping our foundry with moulding machines with a view of obtaining absolute uniformity in our castings and all our departments are equipped with the latest up-to-date machines operated by high-grade mechanics to obtain the best results at the lowest cost. The reduced cost enables us to put in constructive details more labor than has ever been done hitherto in loom construction, the result of which accrues to the benefit of the mills in larger production and less breakages of parts. The fact that the shuttle is changed when the loom is at rest and, the transfer once accomplished the mechanism is idle until called into play again the next time the filling runs out, is another reason for the small amount of repairs connected with the loom. Reports received from time to time from mills operating our looms show extraordinary low cost for repairs and up-keep and our own accounts with these mills verify these figures.

Beginning with the earliest installation the last fact is interesting as it shows that the wear and tear on the "Ideal" loom is no more than on any plain loom. In fact, we believe that, due to the extra weight of our machines and the special pains taken in construction, at the expiration of a

term of years they will show less wear than any other looms, regardless of the type. Further than this, the actual cost for up-keep for the period under consideration would be less for the "Ideal" than for any of its competitors.

The great objection to automatic looms prior to the introduction of the "Ideal" lay in the use of a single shuttle, the change of filling being accomplished with the loom in motion by violently forcing a fresh bobbin into the place of the spent one, the incoming bobbin driving the other out through the bottom of the shuttle. This construction necessarily caused constant breakages of bobbins and castings and frequently tore out an entire warp, entailing serious loss to the mill, not only in bobbins and castings but in production as well. Again, in bobbin-changing looms a self-threading shuttle was used and as it frequently happened that it failed to thread itself, thick and thin places were unavoidable hence the well-founded complaint that automatic weaving was imperfect. Conditions now are quite different however, broken bobbins are never heard of in mills operating "Ideal" looms and smash-hands are an unknown quantity. It is also generally conceded that on a question of quality of production there are no looms, either plain or automatic, which can show such excellent and consistent results.

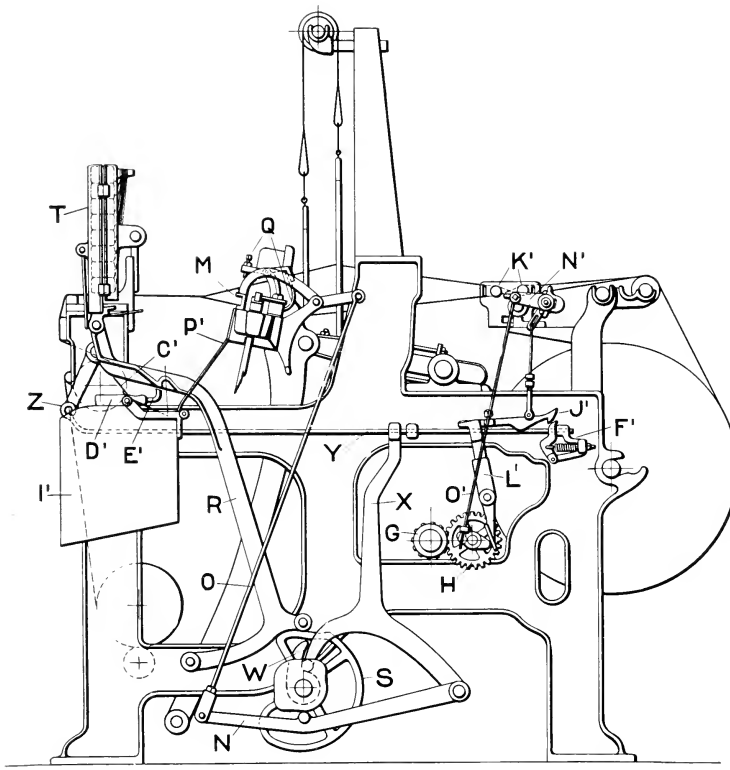


PLATE 1

Automatic Loom — Magazine End

MECHANICAL DESCRIPTION

OF THE

PAGES 11 to 15 and the accompanying illustrations give a comprehensive idea of the manner in which the automatic shuttle replenishing motion is operated.

In Plates 2 and 3 K indicates a combination friction pulley and bevel gear; I indicates a shaft having a bevel pinion, J, on one end and a worm, H, on the other. The pinion J engages with the gear and the worm H with the worm wheel G. It follows that as the pulley K has a continuous motion the worm wheel G must also have a continuous motion but at a comparatively slow speed. This worm wheel is loose on the shaft L and carries no load until brought into use by means of the filling fork which detects the absence of weft in the usual way and through its connection gives the impetus to the change shaft. This is accomplished through the connection C and E and the clutch lever F which is mounted on a hub keyed to the cross shaft. This lever F is caused to engage with the disk cast integral with the worm wheel with the result that the cross shaft is set in motion from the worm gear. Through the medium of cams on the opposite end of the shaft (see Plate 1) the changing of the shuttle is accomplished.

The cams referred to are three in number; two of them are cast together as a single casting and the third is locked to the other two in such a way that it is impossible for them to get out of time. Turning to Plate 1, S indicates the conveyor lever cam and W the starting lever cam which is cast integral with the front board cam. The front board cam is the edge cam shown in contact with the roll on the lever N.

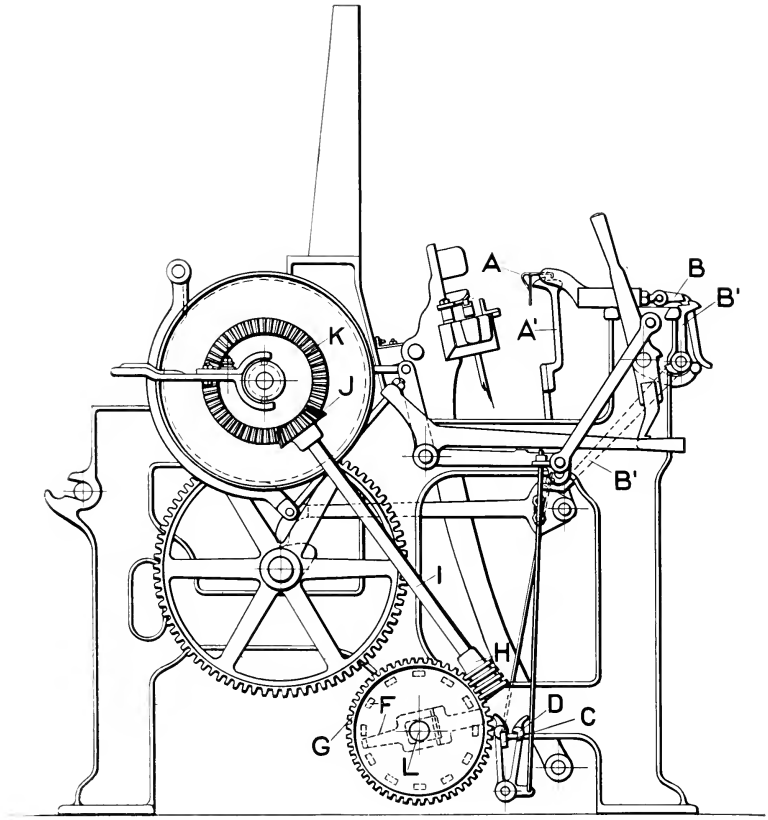


PLATE 2

Automatic Loom — Shipper End

The operations controlled by the cams are as follows: as the cross shaft revolves, the cam S starts the conveyor lever forward to receive a fresh shuttle from the magazine T. The cam W through the lever N and connector O now raises the front board M to permit the spent shuttle to be ejected by the continued action of this same lever N which brings into operation the ejector Q and thus throws out the shuttle to be guided by the leather apron P′ into the receiving box I′. The conveyor lever now starts back, carrying a fresh shuttle. The front board is kept raised to permit of placing this shuttle in the box. After this is done, the front board is closed by means of a spring and the conveyor lever starts towards its normal position. The starting lever cam W now gives motion to the lever X. This motion continues through the shipper rod Y and the giveaway lever Z throws in the shipper handle and starts the loom. By this time the conveyor lever has returned to its normal position and the clutch lever F (Plates 2 and 3), coming in contact with the cam lever E, is thrown out and the cycle of operations is completed. The cross shaft and all the parts and connections are now idle, and remain so until it is necessary to replenish the filling again, the entire operation being caused by a single revolution of the cam.

To retrace our steps a little, we notice that as the spent shuttle is ejected and falls into the receiving box I′ its fall is checked by the plate C′, so that it falls easily and without shock into the box and thus is prevented from receiving injury or undue wear. The plate C′, however, has a double function. In addition to checking the fall of the ejected shuttle it prevents the possibility of there being two shuttles in the loom at once. Were it not for this device such a situation might develop through accident or through some fault of the weaver. The plate C′ acts in connection with the weighted lever D′ and the hook E′. Normally, as the conveyor lever goes forward to receive a new shuttle, the hook engages with a recess which can be seen in the conveyor lever R. This hook is released when the spent

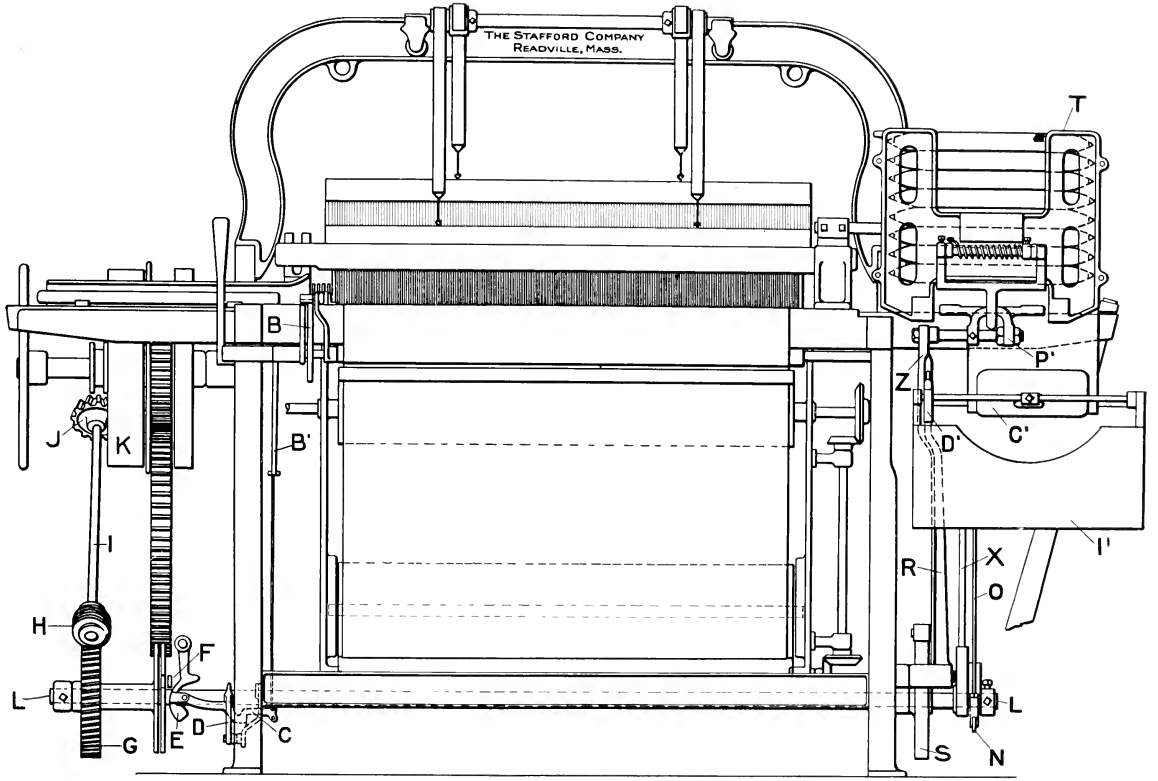


PLATE 3

Automatic Loom — Front View

shuttle falls on the plate on its way into the receiver box and thus frees the conveyor lever so that it can perform the rest of its normal functions; but if no shuttle is ejected the hook remains engaged with the conveyor lever so that the lever is held away from its cam. The cam thus completes its rotation without giving the normal motion to the conveyor lever; thus no new shuttle is placed in the loom and the loom will not start.

Another safety device guards the motion that operates the cross shaft at D (Plate 2). This device renders it impossible for the worm wheel to give motion to the cross shaft unless it is thrown into engagement in the normal way through the filling fork. The magazine also yields to prevent breakage of shuttle if caught.

The warp stop motion is driven by the gear G′ (Plate 1) on the bottom shaft; this gear drives the gear H′, on which is a cam that gives a reciprocating motion to the lever L′. The follower bar is driven by N′ and receives motion from the connection rod O′ and a crank and swivel on the driven gear shaft. As the follower bar travels backward and forward it causes the hook J′, by means of a wire connector, to clear the giveaway collar F′ on the rod Y. If, however, the motion of the follower bar is arrested by a fallen drop wire K′ of which there is one for each warp end, the hook is not lifted but engages with the giveaway collar F′ on its movement, when as it goes forward it carries the rod Y with it. This rod knocks off the shipper handle and stops the loom.

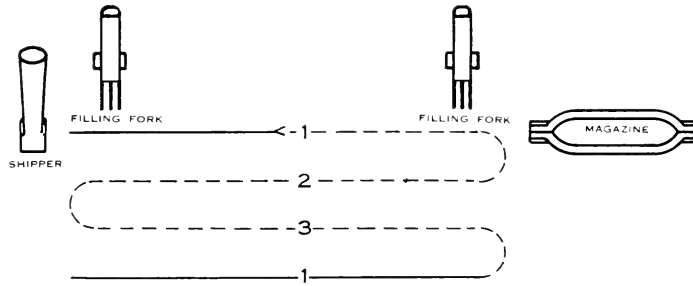


FIGURE 1

FILLING RUNNING OUT WITH SHUTTLE TRAVELLING TOWARDS MAGAZINE END

DOTTED LINES SHOW EMPTY SHUTTLE PICKED TWICE AFTER FILLING FORK ACTS

THE NUMBERS 1 2 AND 3 INDICATE THE SHEDS

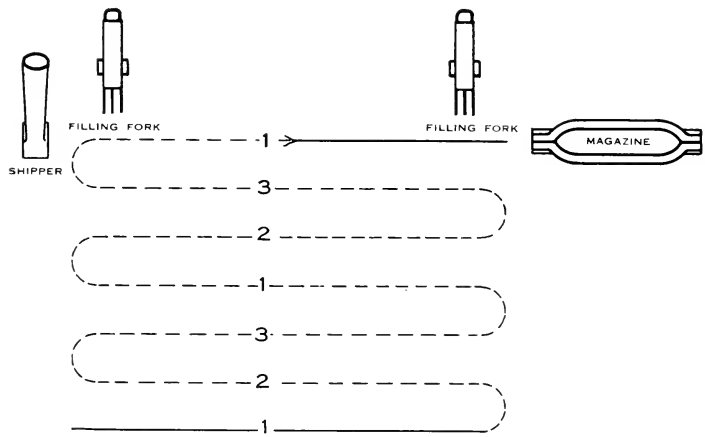


FIGURE 2

FILLING RUNNING OUT WITH SHUTTLE TRAVELLING TOWARDS SHIPPER END

DOTTED LINES SHOW EMPTY SHUTTLE PICKED FIVE TIMES AFTER FILLING FORK ACTS

THE NUMBERS 1, 2 AND 3 INDICATE THE SHEDS

PLATE 4

DIAGRAM OF THREE HARNESS PICK-FINDER

THIS device is used in making 3 harness goods where the occurrence of frequent miss-picks is a serious defect and provides a simple and practical way of guarding against such imperfections without adding to the cost of the goods by increased waste of yarn, bobbin strippers or special preparation in other departments.

In the case of an "Ideal" automatic loom making plain goods, as soon as the filling runs out the loom stops and after the spent shuttle is ejected the fresh one is placed in the lay and the loom restarts weaving. There is an immediate change of shuttles whenever the filling fork indicates the absence of weft providing the shuttle is in the box at the magazine end and if the shuttle happens to be in the opposite end it is picked across and then the change is effected. It will be readily understood, however, that were the same thing done in weaving 3 harness goods there would be numerous defects in the goods due to miss-picks. If the shuttle were travelling toward the shipper end when the break occurred, it would be picked empty through the next shed into the magazine end, when the change would be effected and the first pick out of the new shuttle would go through the following shed. In this case, if the break happened in the first shed, the new shuttle would be picked first through the third shed and so leave a partial miss-pick in the first and a complete pick out of the second. Again, if the break occurred when the shuttle was travelling toward the magazine end, the first pick from the new shuttle would go through the following shed, which would be correct, but there would be a partial pick missing out of the shed where the filling ran out. Now it is the recurrence of such defects as this that the pick finder is designed to prevent and it does so in a simple and practical manner by delaying the change of the shuttle when the filling has become exhausted until the spent shuttle is in the box at the magazine end and the harnesses are in such position

that the first pick from the new shuttle is sure to go through the *same* shed where the break occurred. Thus, if the shuttle is travelling toward the magazine end when the filling runs out, it will be picked twice empty, that is, into the other box and back again and the change will be effected on the next pick when the same shed is up again that contained the last pick or partial pick from the spent shuttle (see diagram). It should be noted, however, that immediately the filling fork indicates, the take-up and let-off mechanisms are thrown out so that there are no thin places, which otherwise would be the case were these motions not stopped until the shuttle was actually changed. In the other case, when the break occurs with the shuttle travelling toward the shipper end, it will be observed (see diagram) that picking the empty shuttle twice will bring the correct shed up again but the shuttle will be at the shipper end and consequently cannot be changed; another pick will bring it into the right box but the wrong shed will be up, so it is picked twice more; the loom then stops, the shuttle is changed and it will be noted that the first pick from the new shuttle goes through the shed where the break occurred the same as in the first case except that there the empty shuttle was picked twice whereas here it is picked five times.

AFTER loom has been set level on the floor, set first from top of loom side to top of whip roll bearing 7″; from top of loom side to top of warp stop stand $4\frac{1}{2}$″; set the warp stop to just clear the cranks; whip roll in the outer bearing. Next set the follower bar so that it will pass under the contact bars an equal distance both on the front and back contact bars. The giveaway lever to pass an equal distance on each side of the centre; then put the follower bar on full throw; set the cam so that it will just begin to move the lever. Set the lifting collar so that hook is lifted just clear of the knock off collar. Then put the shuttle in the magazine end and set lay 1″ forward of the back centre. Then time the warp stop so that the cam will be at nearly full throw. Set the adjusting screw so that hook is held out of contact with the knock off collar when cam is at half throw. Care should be taken to see that the lifting finger lifts equally on each side of the centre.

2. Shipper Motion. First see that the vertical shaft runs freely and that the worm meshes well in the worm wheel and the bevel gear meshes well into the pulley. Then set your friction so that it will carry the loom easily, care being used in this setting so as not to get more friction than is needed. For instance, when the dagger is against the steel, and the shipper handle is pulled on, the pulley should slip on the friction so as to prevent the belt from slipping off the pulley. Set the giveaway lever so that the movement will be equal on each side of the centre. Then set the knock off collar as far under the shipper handle as possible; pull the shipper handle on and set firmly against the same; then see that the spring on the giveaway lever is strong enough to pull the shipper on without stretching.

3. Brake Motion. See that the brake shoe clears the brake wheel when the loom is running; then knock

the shipper handle off and take up on the brake rod until the shipper handle will move about $\frac{1}{2}''$ before coming against the brake lever to take the brake off when starting the loom.

4. Filling Fork. Put the lay on front centre, shuttle in the pulley end of the loom, fork flush with the back of filling grate; then set cam so there will be $\frac{1}{8}''$ between the fork hook and filling lever hook. Care should be used to take away any lost motion between the fork and shipper handle.

5. Conveyor Lever. Put the lay $1''$ forward of back centre, let conveyor lever just clear the race plate when forward; see that the conveyor top is square with the lay; then put the lay on front centre and set the roll in the conveyor lever so that the conveyor finger will clear lay $\frac{3}{8}''$ when magazine shaft is at rest.

6. Magazine Shaft. Put the starting lever in the pocket of the starting cam; set conveyor cam with stop against the bar on the starting cam, the plunger in the disc on opposite end of shaft to be half way between the high and low point on the cam lever with cam lever locked in position, the plunger to be flush with the inside of the disc. Be sure there is no end play in the shaft and tighten up all parts.

7. Magazine. Let the shuttle rest on magazine bottoms just touching the conveyor fingers, the magazine gate to just pass under the next shuttle on forward movement of the conveyor lever, care being taken that the shuttles do not fall on this gate, but rather as the gate passes under it will raise the shuttles clear of the bottom shuttle so that this shuttle may pass out of the magazine freely without the weight of the shuttle above bearing on it.

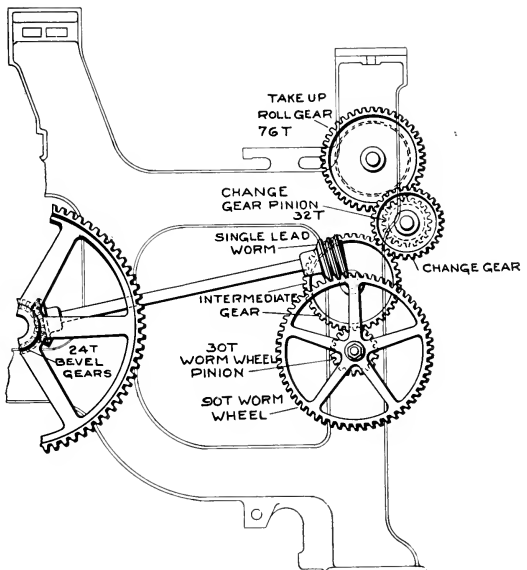
8. Ejector. When the front board or shuttle box is lifted to eject the spent shuttle, care should be used that it lifts only high enough to push the empty shuttle out of the

box and the ejector recedes under the swell and out of the way of the incoming shuttle. This adjustment is made by taking up or letting out the connector rod from the shuttle box to the cam or by the set screw which comes into contact with front board as it is raised.

9. Catcher Box. Put lay on front centre, catcher box to just clear picking stick and high enough so that the safety hook will be on a level line; set the tumbler with its lower edge flush with the bevel edge on the catcher box.

10. Locking Motion. Pull the shipper handle on and set collar so that the hook is pulled across the release latch enough to lock the same.

11. The final setting is the collar on the wire from the lifting lever down to the release latch starting the automatic motion. This collar is usually set 1″ above the lifting lever.



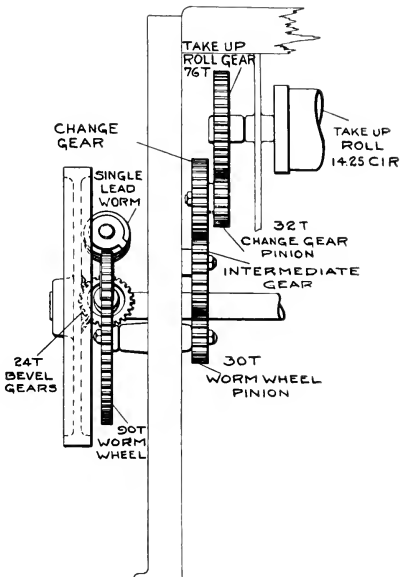


PLATE 5

TAKE-UP MOTION

THE take-up motion is driven by a shaft and worm, which in turn are driven by a crown gear cast on the hub of the large gear on the cam shaft. The diagram (Plate 5) shows the train of gears which in this case provides for one pick in the cloth for each pick in the change gear. The calculation is as follows:

$$\frac{76 \times 90 \times 24 \times 2}{32 \times 30 \times 1 \times 24 \times 14.25} = 1$$

It can also be arranged to give two picks for each tooth in change gear by changing the intermediate gear pinion to 15 T or by using a 16 T change gear pinion. Where from 68 to 136 picks are called for the take up would ordinarily be laid out in this way. For picks in excess of 136 the motion will give four picks for each tooth in change gear by using a 15 T intermediate gear pinion and a 16 T change gear pinion. For certain goods such as corduroys where the pick is very high we supply a negative take-up motion if required.

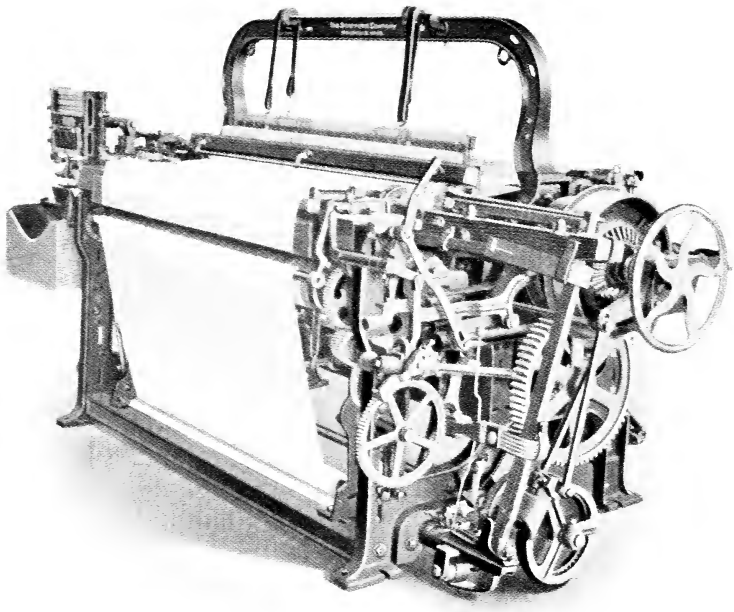


PLATE 6

STANDARD TWO-HARNESS LOOM

The loom shown in illustration is one of our standard 40″ automatic looms equipped for two harness work. It is suitable for almost every variety of goods that can be made with two harnesses, such as shirtings, sheetings, fine lawns, osnaburgs, — to mention but a few, — and is readily convertible to make 3, 4 or 5 harness fabrics or to run with a dobby or other fancy motions. All "Ideal" looms use cop or bobbin filling equally well, and are extremely easy on the yarn, both warp and filling. The normal speed of this loom is 165 picks.

Equipment

Automatic shuttle-changing motion.
Mechanical warp-stop.
Bartlett or friction let-off.
Adjustable vibrating pipe whip roll.
Beam and one-half per loom.
Worm take-up.
Metal cloth roll covered with perforated steel.
Iron breast beam and iron back girt.
3 pick gears per loom.
Friction pulley, standard 14″, arranged to drive either from above or below as required.
Floor stands to crank shaft furnished with underneath drive.

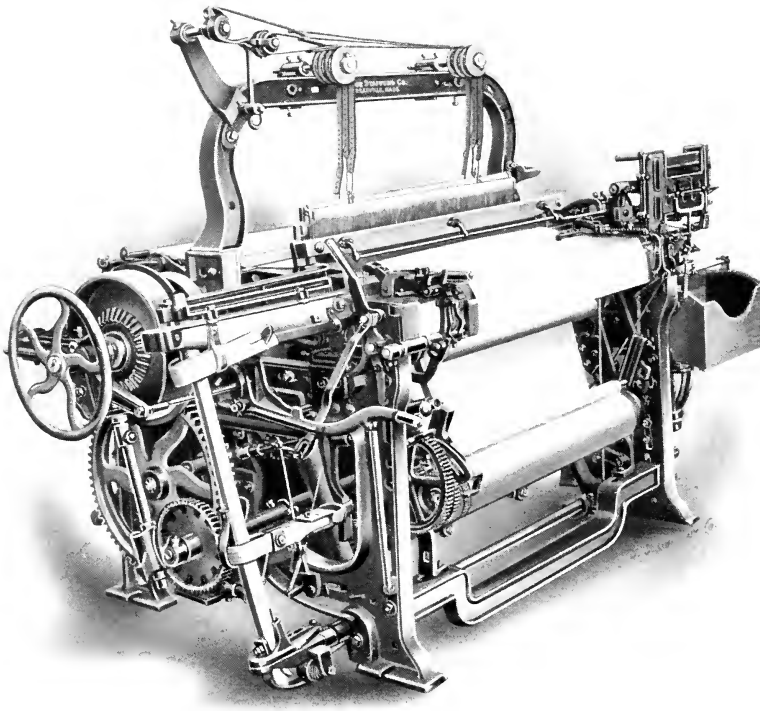


PLATE 7

Drill Loom

This loom is equipped with pick-finder described in detail elsewhere (page 17) and is suitable for a wide line of drills, denims, shirtings, and other goods made with three harnesses where miss-picks have to be guarded against. It is operated with two filling forks so that the cloth space is reduced about $1\frac{1}{2}''$, that is, on an ordinary 32″ loom equipped with the pick-finder motion the limit of width for the cloth would be $30\frac{1}{2}''$. In ordering looms this point should be remembered. This loom is easily converted to run on plain goods, either with cams from the main shaft or the jack shaft, and can be readily used for 4 or 5 harness work, or fancies by applying a dobby.

Equipment

Same general equipment as on standard 40″ loom.
Pick-finding motion.
3 harness cams on jack shaft.
3 step gear on main shaft used for driving jack shaft for 2, 3, 4 or 5 harness work.
Overhead roller motion.
Double set of wooden shieves.

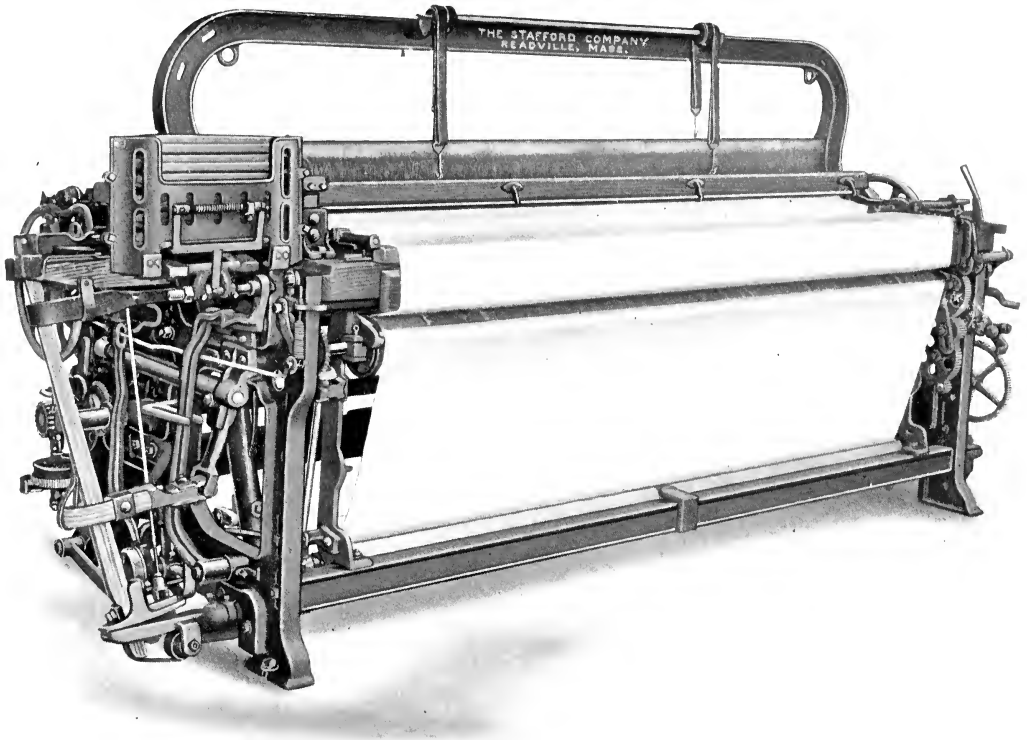


PLATE 8

Intermediate Construction Loom

Cloth Space 62″ to 74″

This loom is suitable for weaving a varied class of fabrics up to 74″, plain or fancy, light or heavy. It is a rugged, strongly built machine, heavier in general outlines than the narrower models and equipped with a centre bearing but with somewhat less metal than our regular broad construction, which begins at 81″. This loom is being used with excellent results on drills and denims, using the pick-finding motion described on page 17. It is capable of being operated at the highest customary speed for looms of its width and shows general results in production capacity, both as to quality and yardage of cloth, that cannot be excelled.

Equipment

Automatic shuttle-changing motion.
Mechanical warp-stop.
Bartlett or friction let-off.
Adjustable vibrating pipe whip roll, 3″ diameter.
Beam and one-half per loom.
Worm take-up.
Metal cloth roll.
Iron breast beam and back girt.
3 pick gears per loom.
Friction pulley, standard 14″, arranged to drive either from above or below as required.
Crank shaft $1\frac{5}{8}$″ diameter.
Support in centre for crank shaft, bottom shaft and warp stops.
Pipe girt underneath crank shaft extending between loom sides.
Iron pitman and pitman straps.
Harnesses operated by two sets of cams on jack shafts at either end of the loom.

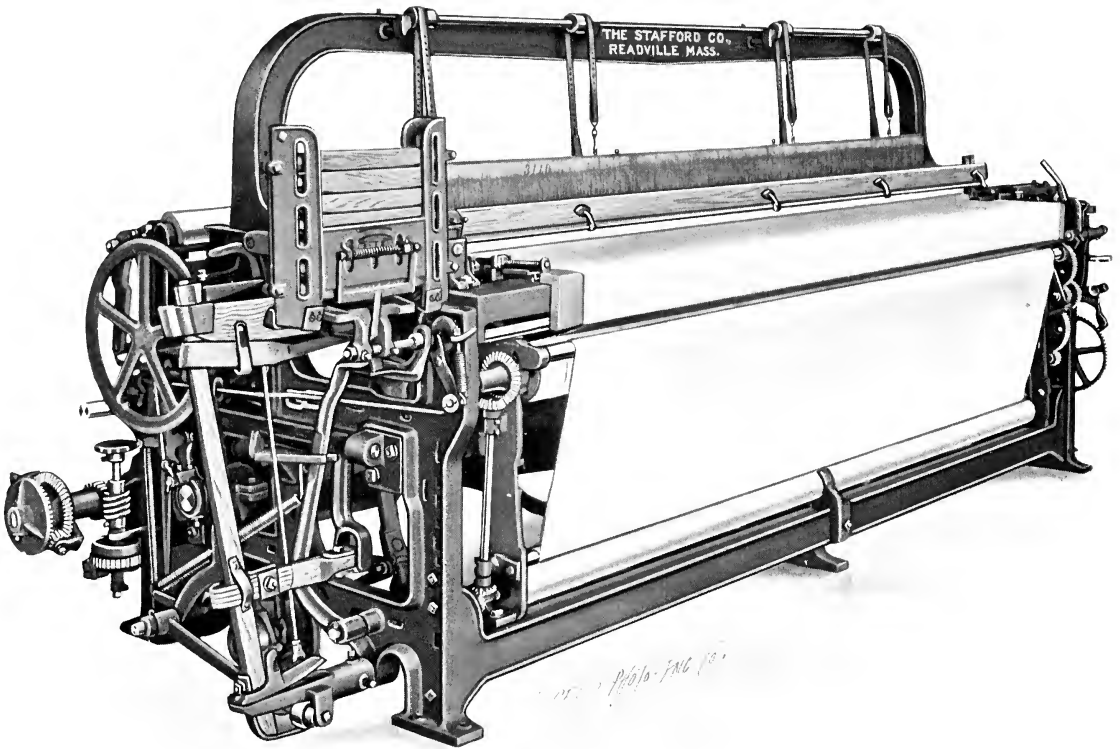


PLATE 9

Broad Loom

This construction begins at what we term our nine-quarter (81″) width and is made in four sizes: 81″; 90″; 99″ and 108″ cloth spaces. It is a heavy, strongly built loom but has the same pleasing general lines as the smaller models. Weight has been added where most needed; the girts and shafting are all made suitably heavy to give the loom the required stiffness, besides which there is a centre transom which gives extra support for the breast beam and another bearing for the cross shafts and warp stop. All the moving parts are made extra heavy and the lay is reinforced by an angle iron extending the entire width between the swords. We furnish a 17″ pulley with this model.

Equipment

Automatic shuttle-changing motion.
Mechanical warp-stop motion.
Compensating let-off.
Adjustable vibrating pipe whip roll, 3″ diameter.
Three (single) beams per loom. (Loom is operated with two single beams.)
Worm take-up.
Pipe take-up roll.
Iron breast beam and back girt.
3 pick gears per loom.
Friction pulley, standard 17″, arranged to drive either from above or below, as required.
Floor stand to crank shaft.
Crank shaft $2\frac{1}{16}$″ diameter.
Centre transom.
Iron pitman and pitman straps.
Harnesses operated by two sets of cams on jack shafts at either end of the loom.

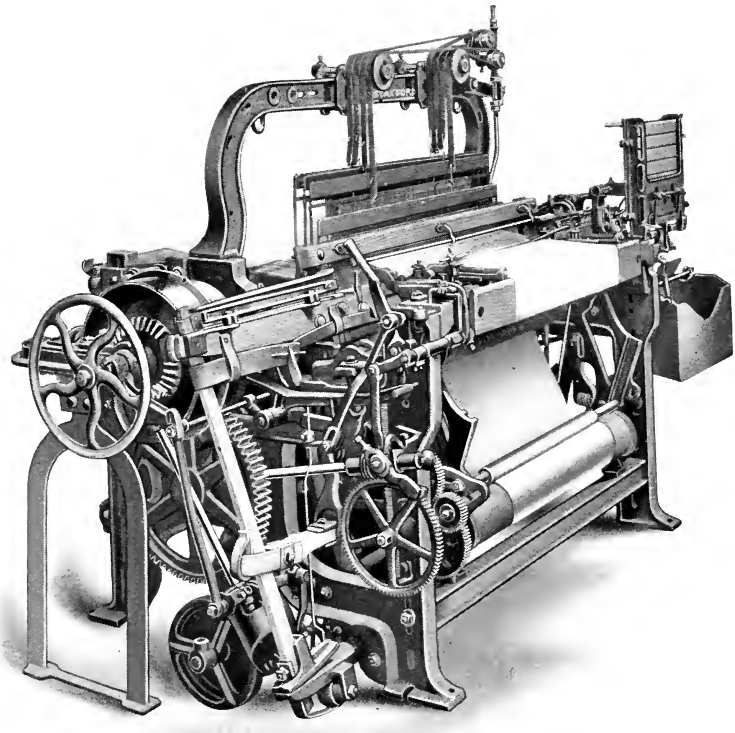


PLATE 10

Pillow-tubing Loom

This class of goods is made with 4 harnesses alternating 3 up and 1 down and 3 down and 1 up. A feature of this loom is the head motion (patented), which is of a very simple type, and does away with many of the objections found in side cams. The harness cams in this model are on the jack shaft on the inside of the loom and the weave can readily be changed by a substitution of new cams. A point of great importance common to all our automatic looms is the readiness with which they can be changed over from one style of goods to another.

Equipment

Same general equipment as on our standard 40" loom.

4 harness cams on jack shaft.

3 step gear on main shaft used for driving jack shaft for 2, 3, 4, or 5 harness work.

Overhead compensating harness motion.

2 sets wooden shieves.

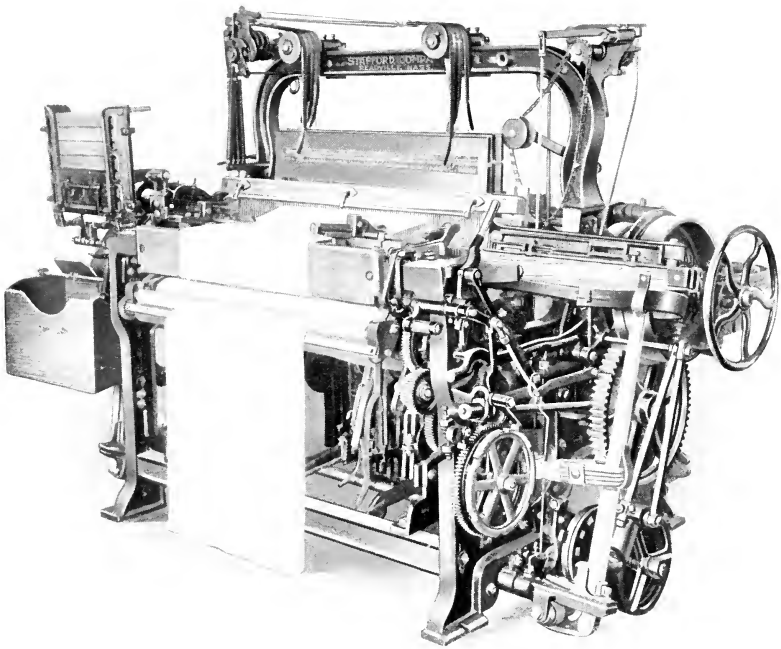


PLATE 11

Bag Loom

This loom makes a complete bag with two sides and bottom woven in. The device on the right of loom arch (see illustration) is part of the measuring motion which indicates the change of weave for closing up the bottom of the bag. The length of bag can be regulated as desired by lengthening or shortening the chain.

Equipment

Same general equipment as our regular pillow-tubing loom.

Special bag motion.

Take-up motion without cloth roll and bottom sand roll.

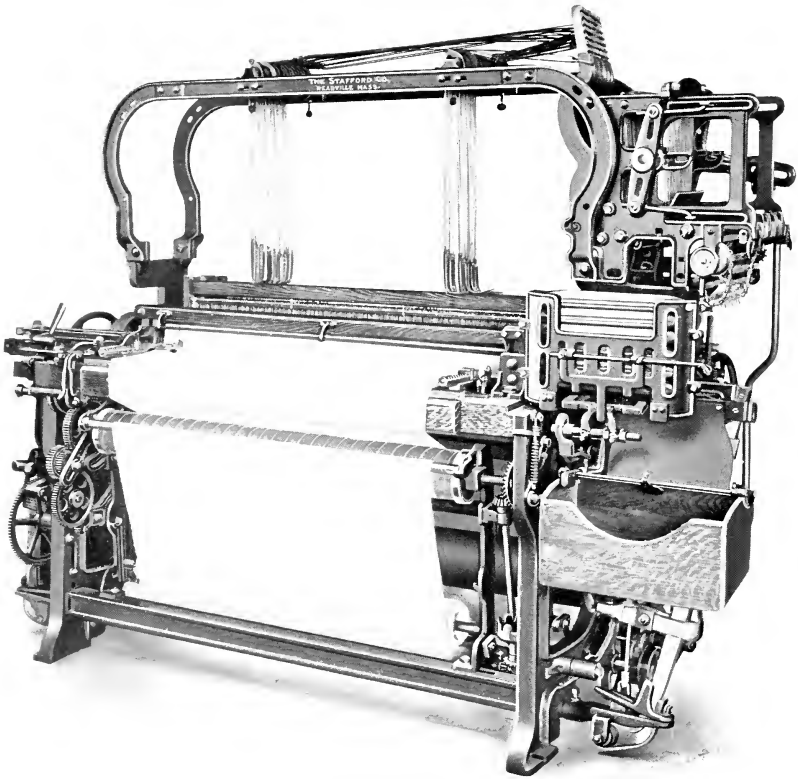


PLATE 12

Dobby Loom

Our number 1 model loom is deep enough to take a 20 harness dobby; number 2 model will take a 12 harness machine and the number 3 model has also space for 12 harnesses. These looms are being operated with great success on a wide variety of fabrics ranging from dress goods to coarse towels using a cop $2\frac{1}{4}$" in diameter. The dobby is driven by a crank from the bottom shaft and the cylinder may be either pawl drive (with double index dobbies only) or worm drive by chain from crank shaft. Stafford dobbies are the standard of excellence. For further description of these machines see page 45.

Equipment

Same general equipment as on our standard 40" loom.
Stafford standard dobby, double or single index.
Special equipment, such as multiplier, fringe motion, jumper motion, leno slackener motion, furnished when specified.

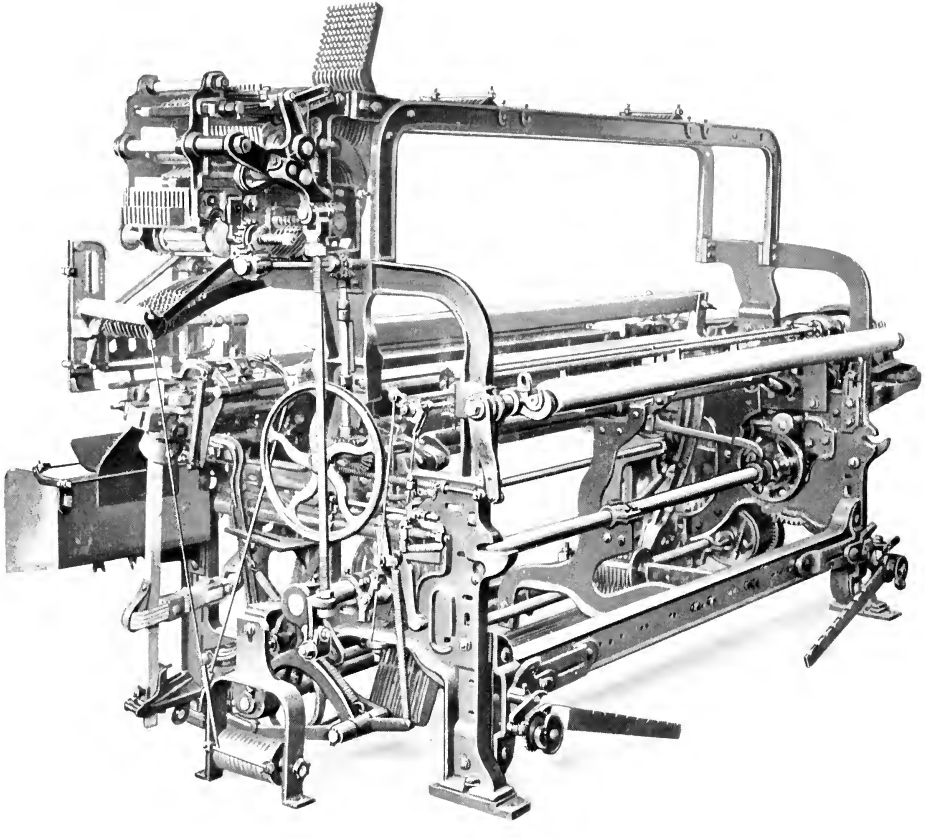


PLATE 13

Worsted Loom

One of the most recent adaptions of "Ideal" automatic looms is for the weaving of worsteds and woollens where one color of filling is used. The fact that Stafford looms weave under plain loom conditions is an important factor in increasing their value in such lines as the above where automatic looms have only been partially successful before. The field is a large one and the opportunities for making substantial savings unusually good. Where conditions require it a positive dobby is furnished of a new and improved design.

EQUIPMENT

Automatic shuttle-changing motion.
Mechanical warp-stop.
Friction let-off.
3″ pipe whip roll (adjustable).
Beam and one-half per loom.
Worm take-up.
Metal cloth roll.
Iron breast beam.
Iron back girt.
Iron pitmans.
Friction pulley.
Crank shaft 1⅝″ diameter.
Centre support.

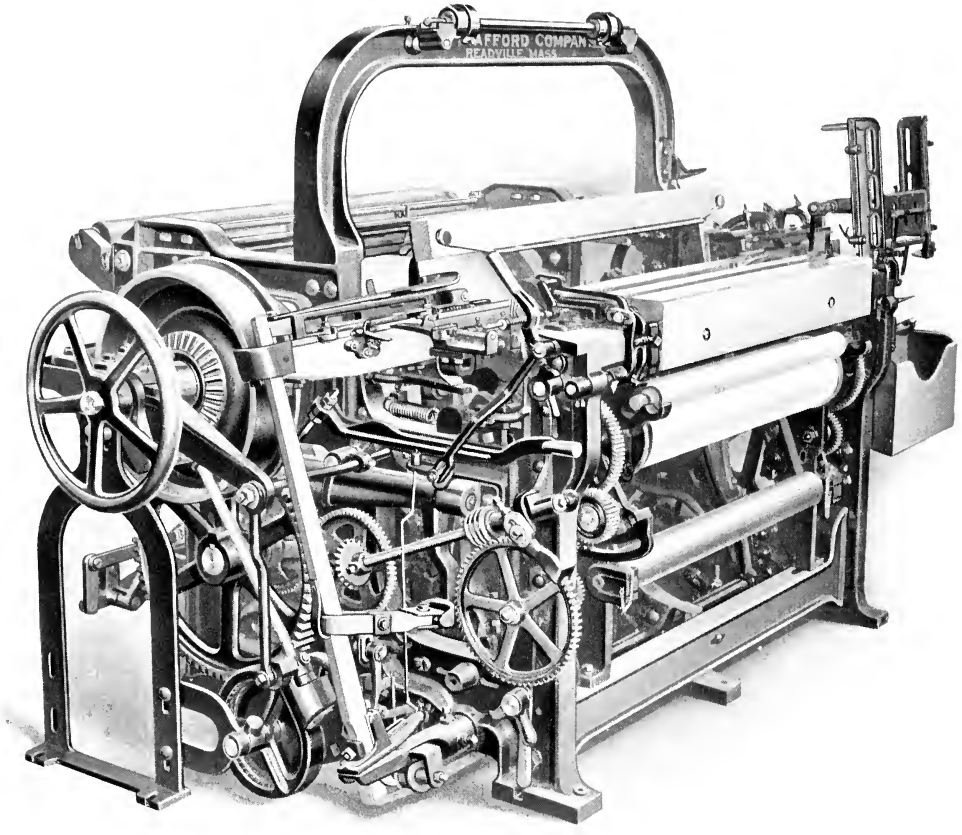


PLATE 14

Duck Loom

This is a special heavy type of loom for making up to 12-ounce ducks and tire fabrics and weighs over 3000 pounds for a loom to make 30″ cloth. This is a new model designed and built with the utmost care to give the best results on the class of goods above named. It is a strong, rigid machine and capable of being operated at high speed with a minimum of breakage and wear and tear. There is a steady and growing demand for looms of this type and the one illustrated on the opposite page represents the last word in modern labor-saving duck loom construction.

EQUIPMENT

Automatic shuttle-changing motion.
Mechanical warp-stop.
Special double friction let-off. Lay extra heavy and reinforced.
17″ pulley.
Centre bearing for crank shaft.
Double whip roll $2\frac{15}{16}$ C. R. steel.
Special heavy take-up.
Harnesses operated by 2 sets of cams on main shaft.
3 pick gears per loom.
Beam and half per loom.

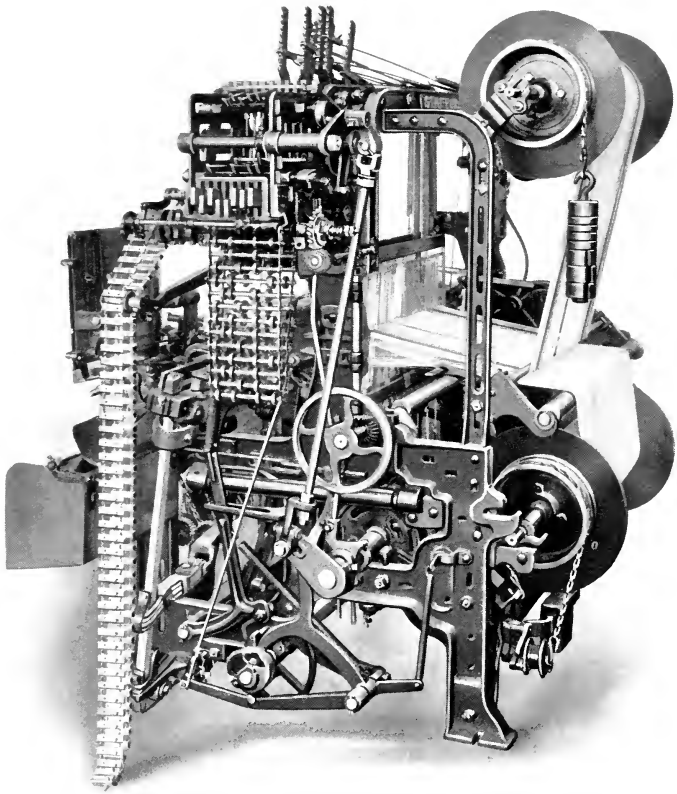


PLATE 15

Terry-towel Loom

This loom is constructed to weave terry-towels without any chain stitch or fringe, and with one color of filling. The harnesses are operated by a special dobby head. Seven levers are used; four operate the harnesses, one for the terry motion, one for regulating the weights on the top beam and one for the "Cramming" motion when the border is woven. The metal chain controls the levers and the wooden chain (see illustration) the length of the towels and the plain weave.

Equipment

Automatic shuttle-changing motion.
Mechanical warp-stop.
Special terry motion.
Beam stands for two beams.
Double friction let-off.
Three beams per loom.
Three pick gears per loom.

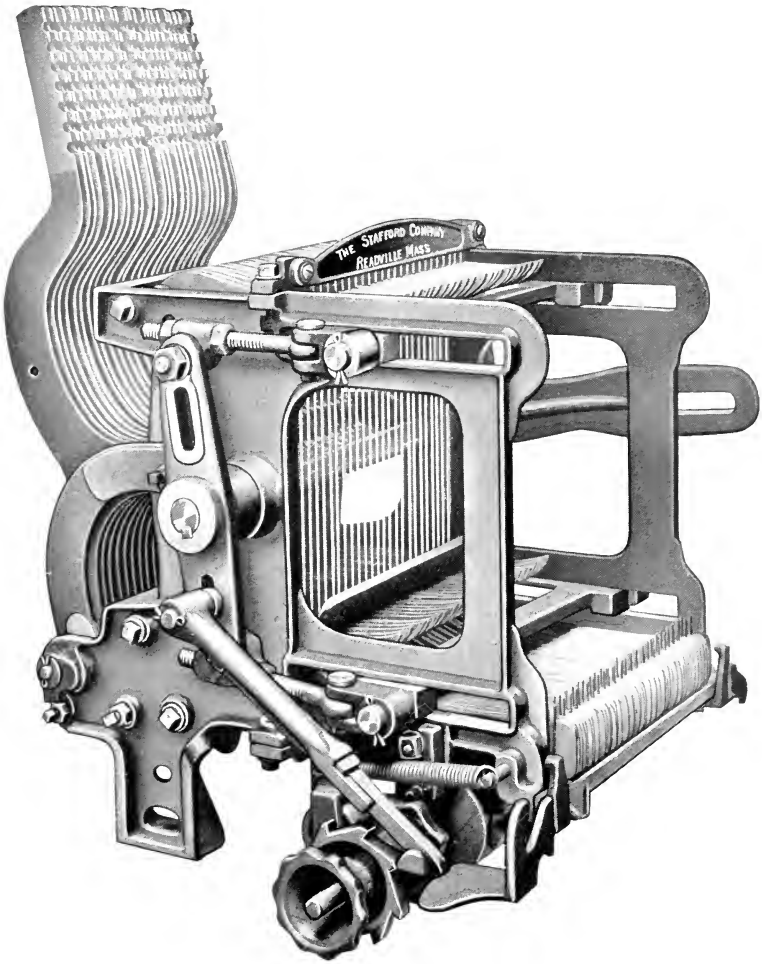


PLATE 16

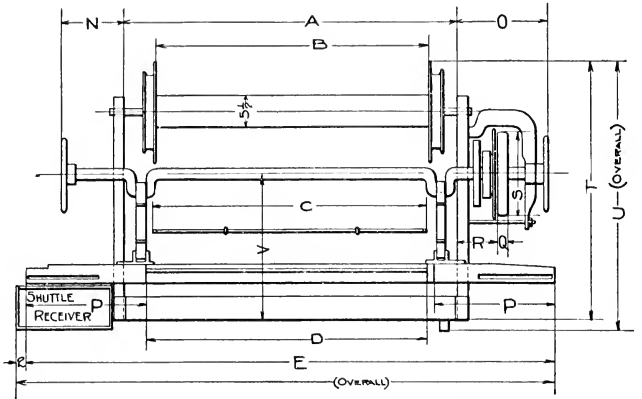
Dobby

For weaving all manner of fancy goods ranging from 8 to 25 harnesses the standard Stafford dobby is the machine best suited for the purpose. It is made in two gauges, $\frac{3}{8}$" and $\frac{7}{16}$", but the former is what is generally used and will handle successfully all but the very heaviest weaves. It is made either single or double index, and the angular shed feature is obtained in a simple and ingenious manner. It is a strong, rugged machine, and has all parts readily accessible to a fixer. The usual fancy motions, such as leno motion, two weave motions and multipliers, can be readily attached at any time.

Equipment

Stafford standard dobby, single or double index.
Hooks and jacks of malleable iron.
Special heavy knife connections.
Harness leveller.
Drive either by crank from bottom shaft or gears from crank shaft.
Cylinder driven by worm and chain from crank shaft or by pawl and ratchet.
30 bars of chain per dobby.
Pegs for one-quarter the number of holes in chain.

DIMENSIONS ON THIS SHEET ARE FOR STANDARD LOOMS AND MAY BE CHANGED IN SPECIAL CASES



		MODEL OF LOOM			
		№1	№2	№3	BROAD
N		9 3/4	9 3/4	10 1/8	10
O		16 3/4	16 3/4	17 1/4	19 1/8
P = LENGTH SHUTTLE BOX	14 1/2" SHUTTLE	21 1/4	21 1/4	21 1/4	22 1/4
	15 1/4 "	22	22	22	23
	16 "	22 3/4	22 3/4	22 3/4	23 3/4
Q = WIDTH OF PULLEY		2 3/4	2 3/4	2 3/4	3 1/4
R		7 1/4	7 1/4	7 3/4	9 1/8
S = DIA. OF PULLEY		14	14	14	17
T = DEPTH FROM BREAST BEAM	17" BEAM HEAD	46 1/16	43 7/16	42 1/4	
	18 " "	46 9/16	43 15/16		
	15 1/2" "				46 5/16
U = DEPTH OVERALL	17" BEAM HEAD	48 1/16	45 7/16	43	
	18 " "	48 9/16	45 15/16		
	15 1/2" "				48 5/16
HEIGHT CRANKSHAFT FROM FLOOR		28 1/2	28 1/4	28 1/2	28 1/2
" BREASTBEAM "		32 3/4	32 3/4	32 3/4	32 3/4
DIA LARGEST ROLL OF CLOTH		18	18	18	17
N. DISTANCE BRSTBM TO CRANKSHFT		26 1/2	24	23 1/2	28

9/4 - 1 3/4 - 1 1/4 LOOMS TAKE TWO WARP BEAMS

PRINCIPAL DIMENSIONS FOR "IDEAL" AUTOMATIC COTTON LOOMS

ALL DIMENSIONS ARE IN INCHES.

SIZE OF LOOM			28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	9/4	1 3/4	1 1/4
A = DISTANCE BETW'N LOOM SIDES			43	45	47	49	51	53	55	57	59	61	63	65	67	69	71	73	75	77	79	81	83	85	87	105 1/2	114 1/2	123 1/2
B = " " BEAM HEADS			32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	43 1/8	47 1/8	52 1/8
C = LENGTH OF HARNESS	№1 MODEL	12 HAR & UNDER	33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63	65	67	69	71	73	75	77			
		13-20 HAR.	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63	65	67	69	71	73	75			
	№2 MODEL	5 HAR & UNDER	35	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63	65	67	69	71	73	75	77			
		6- 12 HAR.	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63	65	67	69	71	73	75			
	№3 MODEL	5 HAR & UNDER	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78			
		6- 12 HAR.	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76			
	BROAD LOOM - 2 HAR.																									91 1/2	100 1/2	109 1/2
D = REED SPACE	1 FILLING FORK		33 1/2	35 1/2	37 1/2	39 1/2	41 1/2	43 1/2	45 1/2	47 1/2	49 1/2	51 1/2	53 1/2	55 1/2	57 1/2	59 1/2	61 1/2	63 1/2	65 1/2	67 1/2	69 1/2	71 1/2	73 1/2	75 1/2	77 1/2	92 1/2	101 1/2	110 1/2
	2 " "		32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	92 1/2	101 1/2	110 1/2
E = LENGTH OF LAY	14 1/2" SHUTTLE		77 1/2	79 1/2	81 1/2	83 1/2	85 1/2	87 1/2	89 1/2	91 1/2	93 1/2	95 1/2	97 1/2	99 1/2	101 1/2	103 1/2	105 1/2	107 1/2	109 1/2	111 1/2	113 1/2	115 1/2	117 1/2	119 1/2	121 1/2	142 1/2	151 1/2	160 1/2
	15 1/4" "		79	81	83	85	87	89	91	93	95	97	99	101	103	105	107	109	111	113	115	117	119	121	123	143 3/4	152 1/4	161 1/4
	16" "		80 1/2	82 1/2	84 1/2	86 1/2	88 1/2	90 1/2	92 1/2	94 1/2	96 1/2	98 1/2	100 1/2	102 1/2	104 1/2	106 1/2	108 1/2	110 1/2	112 1/2	114 1/2	116 1/2	118 1/2	120 1/2	122 1/2	124 1/2	144	153	162

PLATE 17

FLOOR PLAN

The table on the opposite page gives the principal dimensions of the different sizes and models in a comprehensive manner. The figures contained therein are subject to slight variations from time to time as changes are made in the construction of the looms, but for general purposes are substantially correct. It is suggested, however, that where it is desired to have a complete mill floor laid out, a blue print of the same be sent us and we will sketch the looms in. The different models designated 1, 2 and 3 vary chiefly in the depth from front to rear. Number 1 model will take a 20 harness dobby, number 2 a 12 harness and number 3 has space for 12 harnesses. Model number 1 is customarily furnished except in cases where looms are going into an old mill and the floor space is restricted. In such cases it is sometimes found advisable to substitute one of the other models in order to get in the required number of looms. Outside of this one point the different models are practically identical.

We make several models of temples for the various styles of goods and have burrs to suit whatever the conditions call for. The temple at the magazine end is equipped with a cutter which severs the end of filling extending from the magazine to the selvage each time the shuttle is changed. Our new model knife cuts the filling close to the selvage, and is a distinct improvement over earlier types, is easily kept in order and gives little trouble to either weaver or fixer.

We pay particular attention to the finish of our drop wires in order to save fraying of warp yarns. In ordering drop wires it is well to provide for about 20 per cent. more than the looms actually call for so as to have a reasonable supply on hand for drawing-in purposes. All our drop wires are punched for the drawing-in machine.

All our goods are sold F. O. B. Readville, Mass. We take every possible care in packing to ensure against breakages, but if any shipment is damaged in transit, claim should be filed with the Transportation Company. We cannot be held responsible for any claims of this description but are always ready to assist as far as possible in obtaining a satisfactory adjudication of such cases.

In shipping looms into the South the custom is to double-deck them when possible and in this way 20 looms are frequently shipped in a car. To near-by points where lower freight rates prevail this is not done unless specially requested at the time the order is placed. A list accompanies each shipment and should be checked against contents immediately upon receipt and any shortage reported at once.

In ordering supplies it is important that full shipping instructions be given, otherwise we use our discretion. It is our custom to ship by freight in all cases where no definite instructions are furnished, unless the shipment be so small that the express charges will not exceed the freight, but in all matters of this kind which are left with us to decide we consider our customer's interests and our own as identical, and act according to our best judgment.

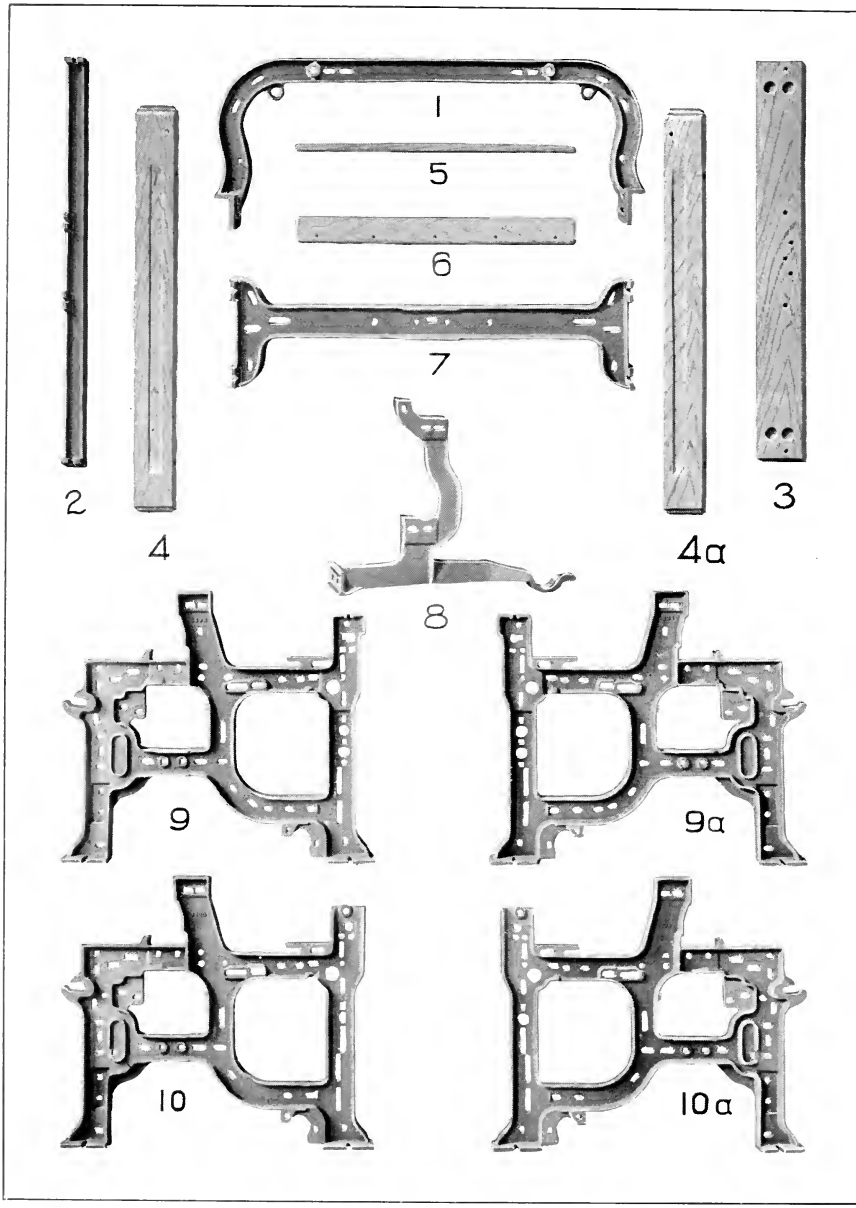


PLATE 18

GIRTS AND LOOM SIDES

PLATE 18

1. Arch.
2. Front Girt.
3. Back Girt (wood).
4. Breast Beam, right hand loom.
4a. " " left " " } Specify size of loom.
5. Breast Beam Strip.
6. Breast Beam Board.
7. Back Girt.
8. Centre Loom Brace.
9. Loom Side, left hand side of left hand loom.
9a. " " right hand side of right hand loom.
10. " " left hand side of right hand loom.
10a. " " right hand side of left hand loom.

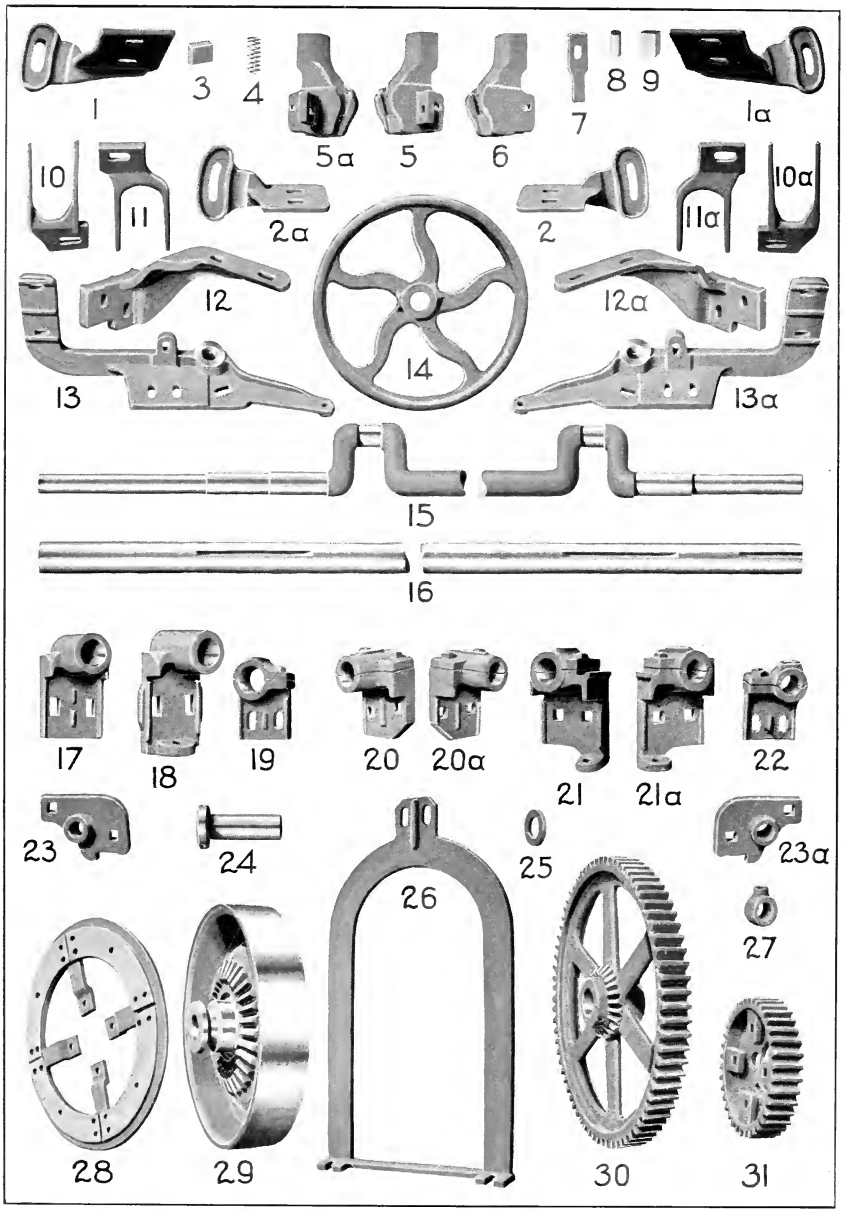


PLATE 19

Driving Motion

PLATE 19

1. Bobbin Box Bracket, right hand loom.
1a. " " " left hand loom.
2. " " " right hand loom (reversed arch).
2a. " " " left hand loom " "
3. Bunter Steel.
4. Bunter Spring.
5. Bunter (shipper end, right hand loom).
5a. " (" " left hand ").
6. " (magazine end).
7. Knock Off from Bunter.
8. Bunter Rubber.
9. " "
10. Belt Guide (overhead drive, right hand loom).
10a. " " " " left hand "
11. " " (underneath drive, right hand loom).
11a. " " " " left hand "
12. Shipper Yoke Stand, right hand loom.
12a. " " " left hand loom.
13. Shipper Yoke Lever Stand, right hand loom.
13a. " " " " left hand "
14. Hand Wheel.
15. Crank Shaft. (Specify size of loom.)
16. Bottom Shaft. " " " "
17. Bottom Shaft Box.
18. " " "
19. Centre Bottom Shaft Box.
20. Crank Shaft Box, right hand.
20a. " " " left hand.
21. " " " right hand.
21a. " " " left hand.
22. Centre Crank Shaft Box.
23. Rocker Shaft Bearing, right hand.
23a. " " " left hand.
24. Friction Pulley Sleeve.
25. Fibre Washer.
26. Floor Stand.
27. Crank Shaft Collar.
28. Friction Pulley Plate.
29. Friction Pulley.
30. Bottom Shaft Gear.
31. Crank Shaft Gear.

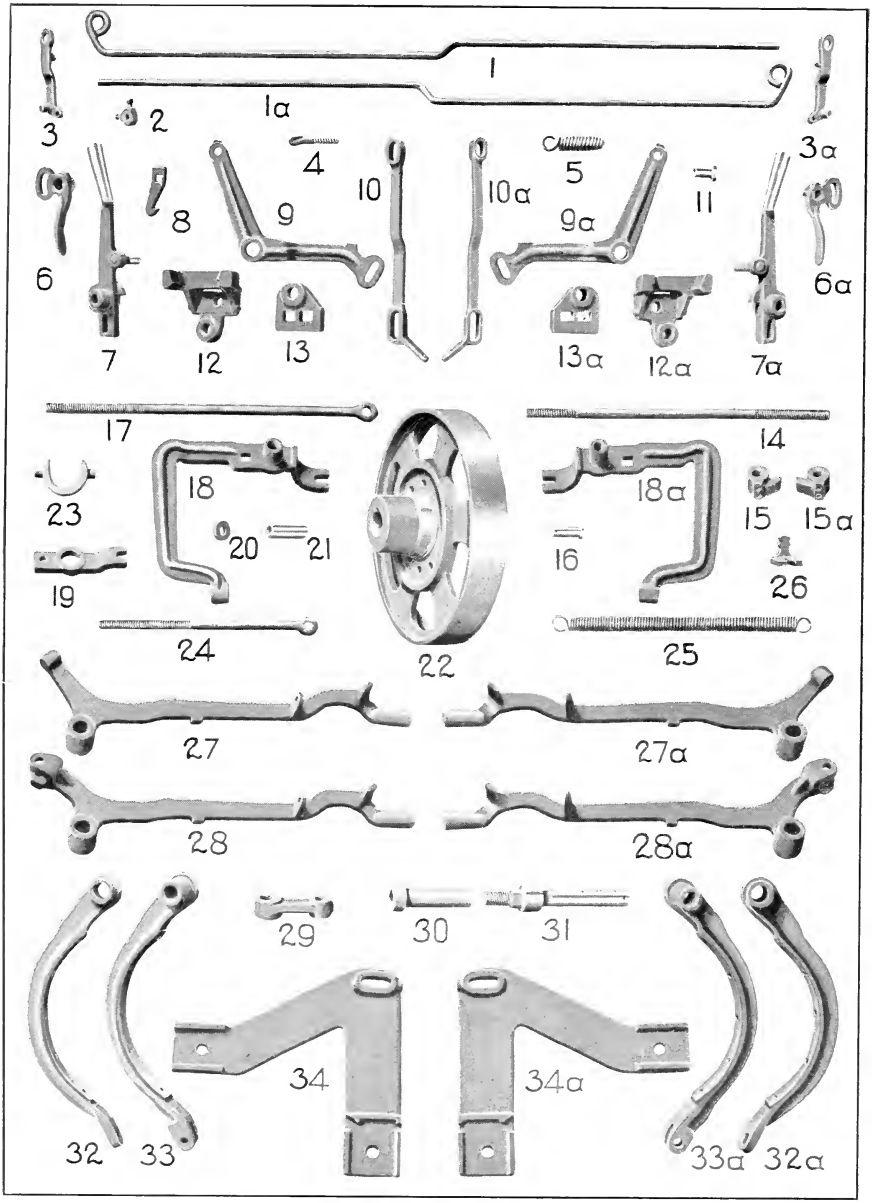


PLATE 20

Brake and Shipper Motions

PLATE 20

1. Shipper Giveaway Lever Connector, right hand loom.
1a. " " " " left hand "
2. Shipper Giveaway Collar.
3. Shipper Giveaway Lever, right hand loom.
3a. " " " left hand "
4. Shipper Giveaway Lever Adjusting Screw.
5. Shipper Giveaway Lever Spring.
6. Shipper Giveaway Bearing, right hand loom.
6a. " " " left hand "
7. Shipper Handle, right hand loom.
7a. " " left hand "
8. Shipper Handle Extension.
9. Shipper Lever, right hand loom.
9a. " " left hand "
10. Shipper Lever Connector, left hand loom.
10a. " " " right hand "
11. Shipper Lever Connector Bushing.
12. Shipper Shaft Bearing, right hand loom (shipper end).
12a. " " " left hand " " "
13. " " " right hand " (magazine end).
13a. " " " left hand " " "
14. Shipper Yoke Stand Tie Rod.
15. Knock Off Lever, right hand loom.
15a. " " " left hand "
16. Shipper Yoke Lever Connector Pin.
17. Shipper Yoke Lever Connector.
18. Shipper Yoke Lever, right hand loom.
18a. Shipper Yoke Lever, left hand loom.
19. Shipper Yoke Lever Top.
20. Shipper Yoke Lever Washer.
21. Shipper Yoke Lever Bushing.
22. Brake Wheel.
23. Friction Pulley Fork.
24. Brake Shoe Connector.
25. Brake Lever Spring.
26. Brake Lever Spring Stand.
27. Brake Lever, right hand loom.
27a. " " left hand "
28. " " right hand "
28a. " " left hand "
29. Brake Lever Stud Brace.
30. Brake Shoe Bushing.
31. Brake Lever Stud.
32. Brake Shoe, right hand loom.
32a. " " left hand "
33. " " right hand "
34. Brake Shoe Bracket, right hand loom.
34a. " " " left hand "

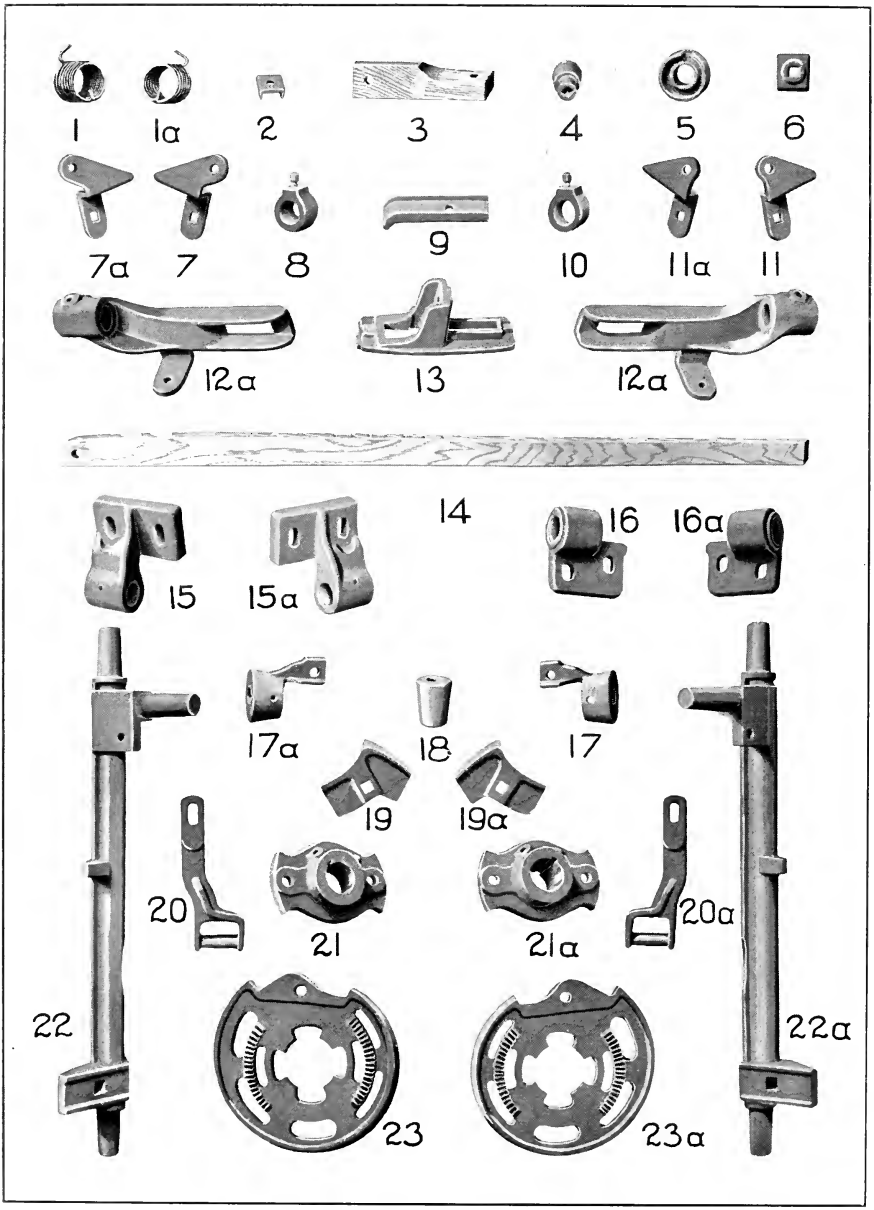


PLATE 21

Picking Motion

PLATE 21

1. Parallel Spring, right hand.
1a. " " left hand.
2. Picker Stick Washer.
3. Lug Stick.
4. Parallel Spring Hub.
5. Parallel Spring Collar.
6. Lug Stick Washer.
7. Picker Stick Check Stand (driving end, right hand loom).
7a. " " " " (" " left hand ").
8. Rocker Shaft Collar.
9. Parallel Wedge.
10. Rocker Shaft Collar.
11. Picker Stick Check Stand (magazine end, right hand loom).
11a. " " " " (" " left hand ").
12. Parallel Bottom, right hand.
12a. " " left hand.
13. Parallel Top.
14. Picker Stick.
15. Pick Shaft Bearing (front, right hand).
15a. " " " (" left hand.)
16. " " " (back, right hand).
16a. " " " (" left hand).
17. Pick Ball Cap, right hand.
17a. " " " left hand.
18. Pick Ball.
19. Pick Cam Toe, right hand.
19a. " " " left hand.
20. Pick Shaft Arm, right hand.
20a. " " " left hand.
21. Pick Cam Hub, right hand.
21a. " " " left hand.
22. Pick Shaft, right hand.
22a. " " left hand.
23. Pick Cam, right hand.
23a. " " left hand.

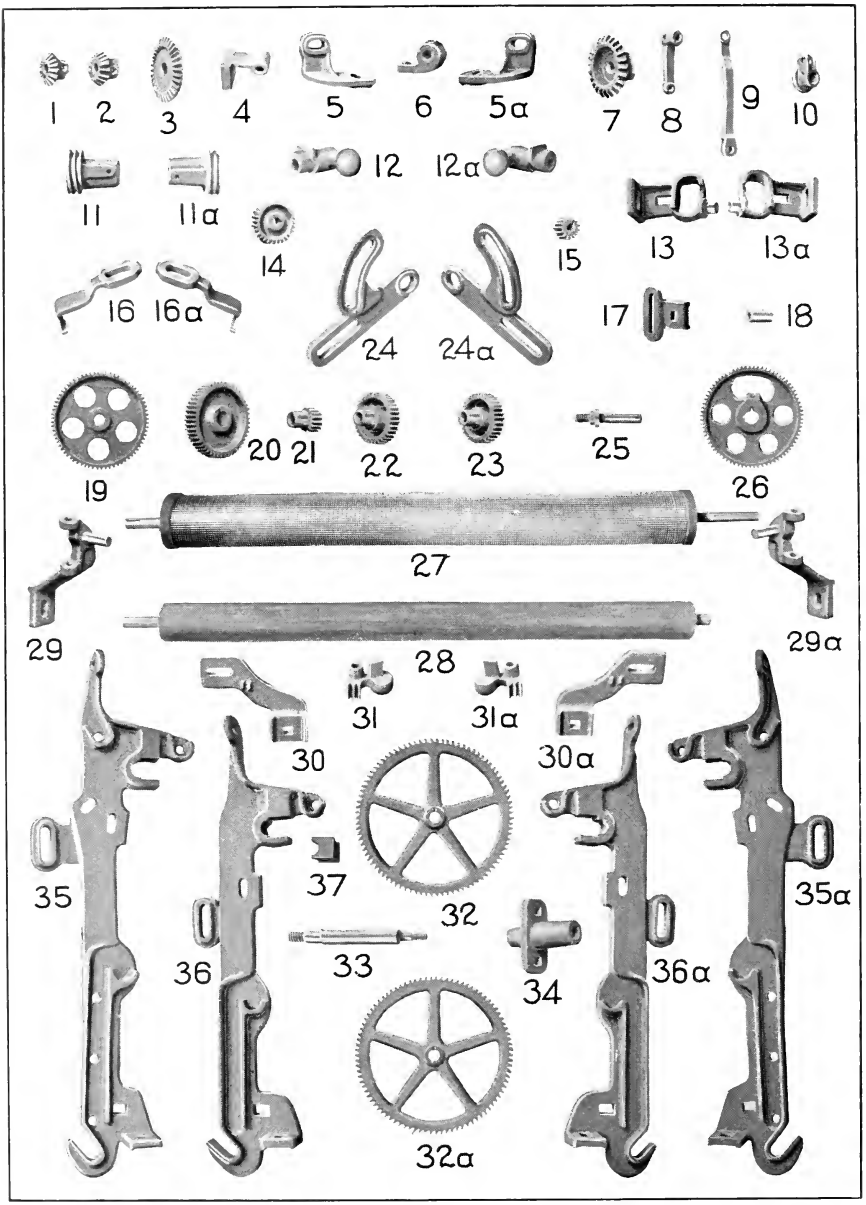


PLATE 22

Take-up Motion

PLATE 22

1. Mitre Gear on Bottom Sand Roll and Bevel Gear Shaft.
2. Bevel Gear on Shaft (top).
3. Bevel Gear on Top Sand Roll.
4. Bevel Gear Stand.
5. Worm Shaft Bearing Support, right hand loom.
5a. " " " " left hand "
6. Worm Shaft Bearing.
7. Worm Shaft Bevel Gear.
8. Worm Shaft Lifting Finger.
9. Worm Shaft Lifting Connector.
10. Worm Shaft Lifting Collar.
11. Worm, right hand loom.
11a. " left hand "
12. Eccentric Hub, right hand loom.
12a. " " left hand "
13. Eccentric Hub Stand, right hand loom.
13a. " " " left hand "
14. Worm Wheel Pinion (30 teeth).
15. " " " (15 ").
16. Let Back Hook, right hand loom.
16a. " " " left hand "
17. Intermediate Gear Stand.
18. Intermediate Gear Bushing.
19. Intermediate Gear.
20. Change Gear. (Specify number of teeth).
21. Change Gear Pinion (16 teeth).
22. Change Gear Pinion (33 teeth, for ribbon steel on top roll).
23. " " " (32 " for Whitin tin on top roll).
24. Change Gear Stand, right hand loom.
24a. " " " left hand "
25. Change Gear Pinion Stud.
26. Top Roll Gear.
27. Top Roll. (Specify ribbon steel or Whitin tin.)
28. Bottom Sand Roll.
29. Let Back Pawl Stand, right hand loom.
29a. " " " " left hand "
30. Let Back Pawl Stand Support, right hand loom.
30a. " " " " " left hand "
31. Let Back Pawl, right hand loom.
31a. " " " left hand "
32. Worm Wheel, right hand loom.
32a. " " left hand "
33. Worm Wheel Shaft.
34. Worm Wheel Stand.
35. Cloth Roll Stand, Low Front Girt, right hand.
35a. " " " " " " left hand.
36. Cloth Roll Stand, High Front Girt, right hand.
36a. " " " " " " left hand.
37. Cloth Roll Stand Plug.

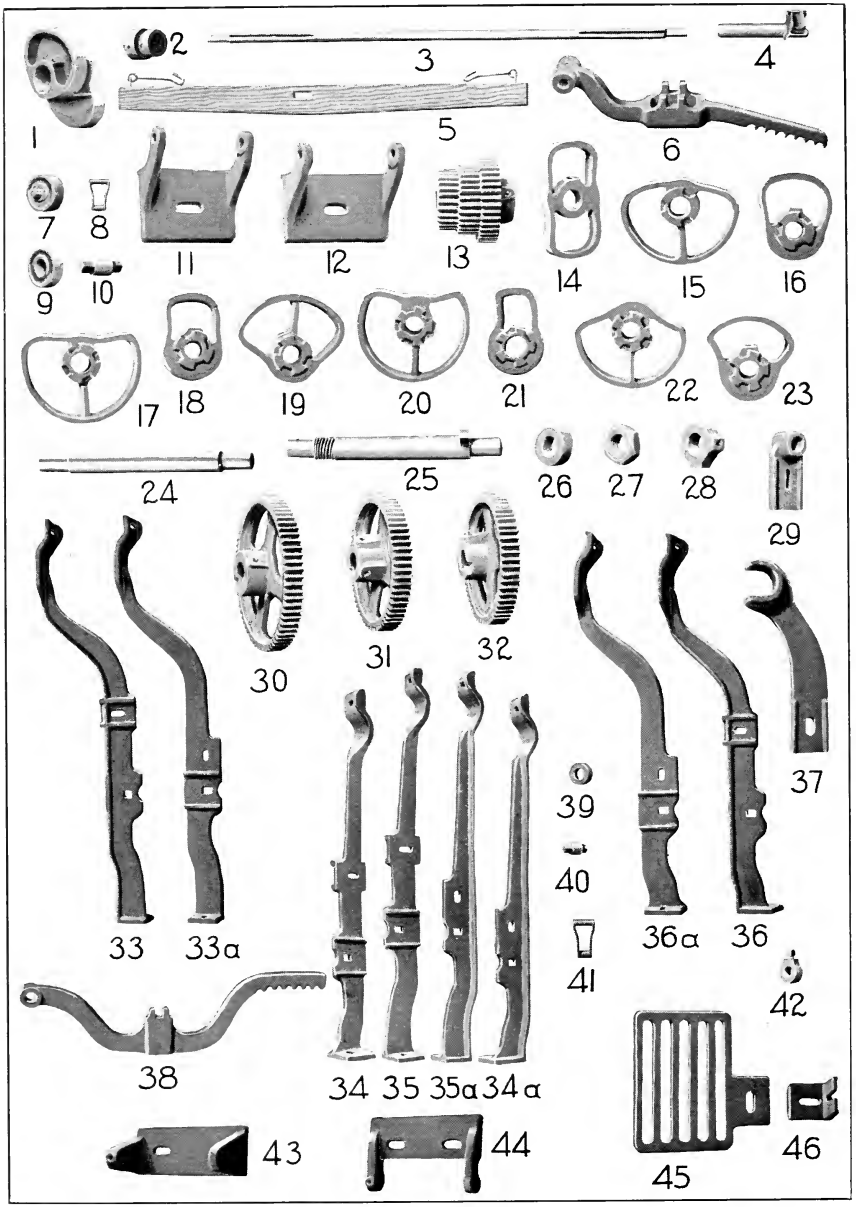


PLATE 23

2, 3, 4 AND 5 HARNESS MOTIONS

PLATE 23

1. Cam.
2. Harness Roll.
3. Harness Roll Shaft. (Specify size of loom.)
4. Harness Roll Shaft Bearing.
5. Lamb Shaft. (Specify size of loom).
6. Treadle (2 harness only).
7. Treadle Roll (2 harness only).
8. Treadle Loop (" " ").
9. Treadle Roll (" " ").
10. Treadle Roll Bearing (2 harness only).
11. Treadle Stand (Iron Girt).
12. " " (Wood Girt).

13. Cone Gear.
14. 2 Harness Cam 1/1.
15. 3 " " 1/2.
16. 3 " " 2/1.
17. 4 " " 1/3.
18. 4 " " 3/1.
19. 4 " " 2/2.
20. 5 " " 1/4.
21. 5 " " 4/1.
22. 5 " " 2/3.
23. 5 " " 3/2.
24. Auxiliary Cam Shaft (steel).
25. " " " (cast iron).
26. Auxiliary Cam Shaft Collar, for C. I. shaft.
27. Auxiliary Cam Shaft Nut, for C. I. shaft.
28. Auxiliary Cam Shaft Collar, for C. I. shaft.
29. Auxiliary Cam Shaft Bearing.
30. 5 Harness Auxiliary Shaft Gear (70 teeth).
31. 4 " " " " (64 ").
32. 3 " " " " (60 ").
33. Cross Girt (low front girt, iron back girt, right hand side of loom).
33a. " " (" " " " " " left hand " " ").
34. " " (high front girt, wood back girt, right hand side of loom).
34a. " " (" " " " " " left hand " " ").
35. " " (high front girt, iron back girt, right hand side of loom).
35a. " " (" " " " " " left hand " " ").
36. " " (low front girt, wood back girt, right hand side of loom).
36a. " " (" " " " " " left hand " " ").
37. Bottom Shaft Hook.
38. Treadle.
39. Treadle Roll.
40. Treadle Roll Bearing.
41. Treadle Loop.
42. Treadle Shaft Collar (2, 3 and 4 harness).
43. Treadle Stand (iron back girt).
44. " " (wood " ").
45. Treadle Rack.
46. Treadle Support.

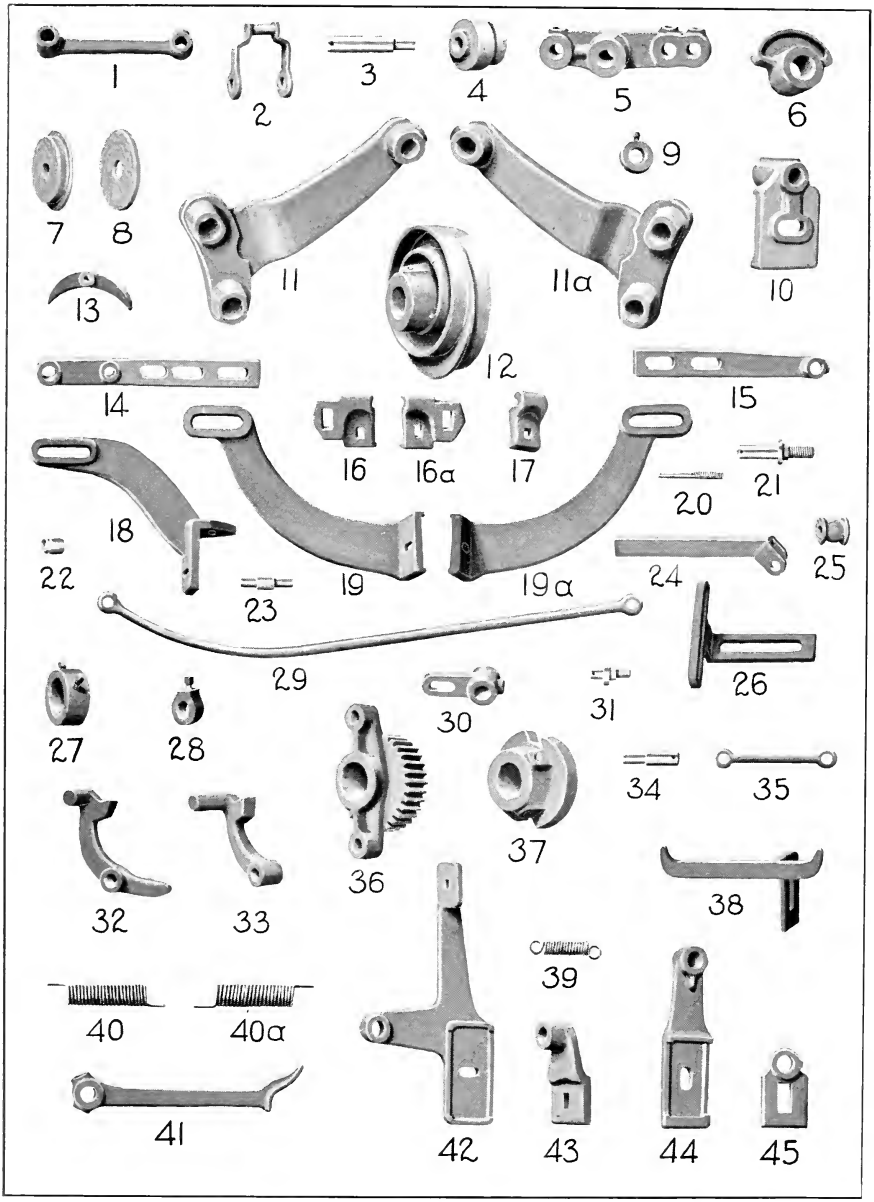


PLATE 24

ROLLER MOTION, SELVAGE MOTION AND 4 HARNESS CLUTCH MOTION

Plate 24

1. Lever.
2. Link.
3. Shaft.
4. Roll.
5. Roll Lever.
6. Segment.
7. Shieve.
8. " (blank).
9. Collar on Shieve Shaft.
11. Stand, right hand loom.
11a. " left hand "

12. Cam.
13. Cam Crescent.
14. Lever.
15. Lever Extension.
16. Stand on Arch, right hand.
16a. " " " left hand.
17. Stand on Arch Clamp.
18. Lever Stand (wood back girt).
19. " " (iron back girt), right hand loom.
19a. " " left hand loom.
20. Bottom Roll Pin.
21. Lever Stud.
22. Roll.
23. Roll and Crescent Pin.
24. Roll Stand on Arch.
25. Wood Roll.
26. Roll Stand on Floor.

27. Collar on Bottom Shaft.
28. Collar on Clutch Operating Shaft.
29. Connector.
30. Connector Lever.
31. Connector Lever Stud.
32. Clutch.
33. "
34. Clutch Pin.
35. Clutch Connector.
36. Gear.
37. Clutch Hub.
38. Lamb Shaft Guard.
39. Clutch Spring.
40. Spring on Clutch Operating Shaft, right hand.
40a. " " " " " left hand.
41. Stop for Clutch.
42. Stand on Cross Girt.
43. Stand on Loom Side.
44. Stand on Cross Girt.
45. Stand on Loom Side.

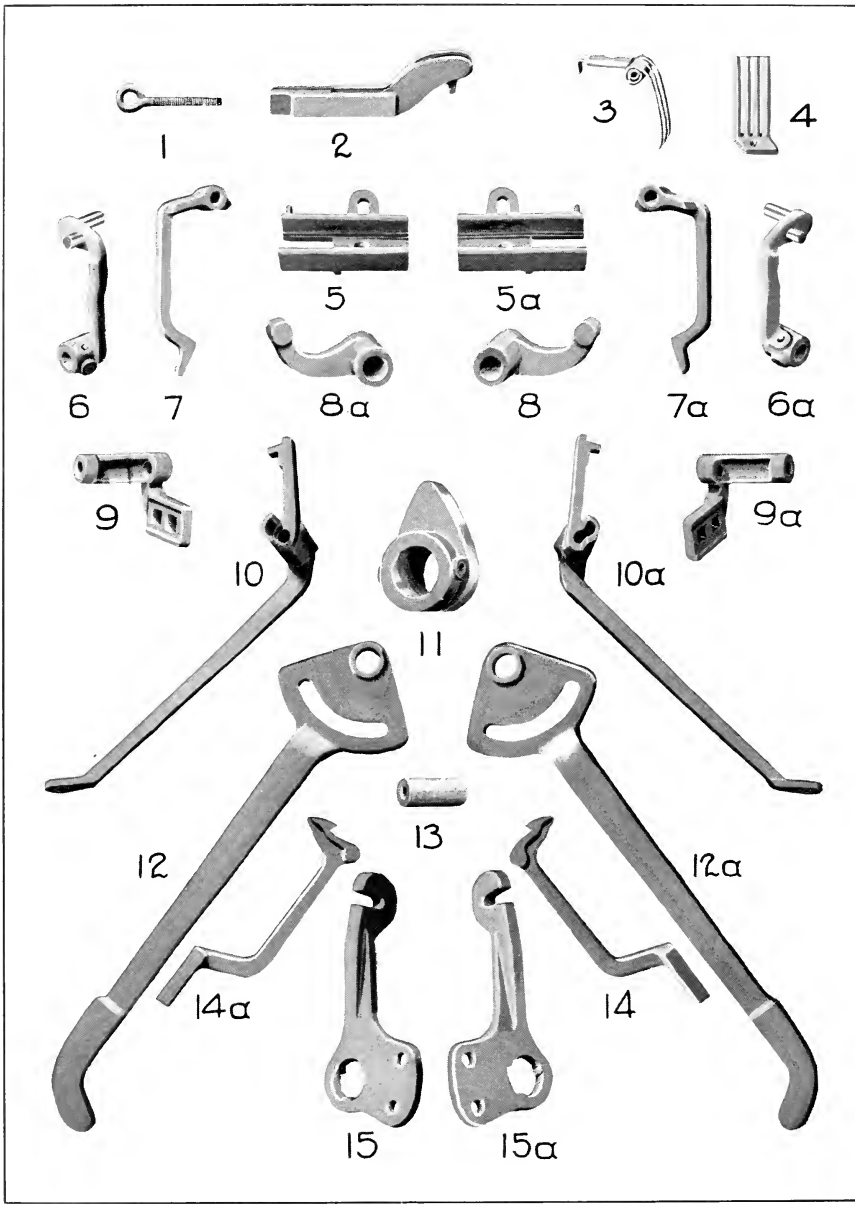


PLATE 25

2 Harness Filling Motion

PLATE 25

1. Filling Fork Holder Eye Bolt.
2. Filling Fork Holder.
3. Filling Fork.
4. Rack.
5. Filling Fork Guide, right hand.
5a. " " " left hand.
6. Pad Finger, right hand loom.
6a. " " left hand "
7. Operating Lever on Pad Finger, right hand loom.
7a. " " " " " left hand "
8. Operating Lever Throw Out, right hand loom.
8a. " " " " left hand "
9. Pad Finger Shaft Stand, right hand loom.
9a. " " " " left hand "
10. Lift Finger for Stop Pawl, right hand loom.
10a. " " " " " left hand "
11. Filling Cam.
12. Filling Cam Lever, right hand loom.
12a. " " " left hand "
13. Filling Cam Lever Bushing.
14. Upright, right hand loom.
14a. " left hand "
15. Upright Support, right hand loom.
15a. " " left hand "

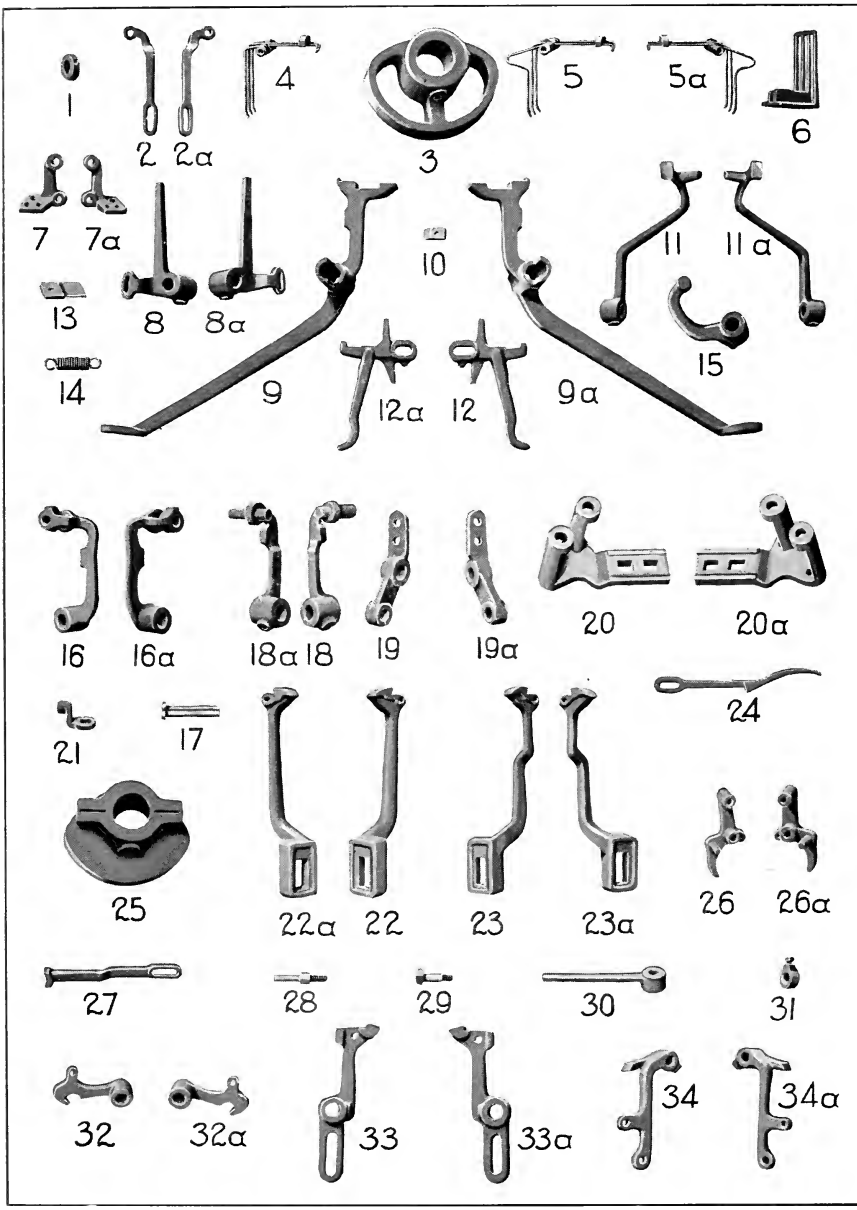


PLATE 26

3, 4 and 5 Harness Filling and Pick-finder Motions

PLATE 26

1. 5/8" Collar.
2. Connector from Operating Lever, right hand loom.
2a. " " " " left hand "
3. Filling Cam (magazine end).
4. Filling Fork (shipper end).
5. " " (magazine end, right hand loom).
5a. " " (" " left hand ").
6. Filling Fork Rack.
7. Guide, right hand loom.
7a. " left hand "
8. Operating Lever Lifting Crank, right hand loom.
8a. " " " " left hand "
9. Lift Finger for Stop Pawl, right hand loom.
9a. " " " " " left hand "
10. Lifting Finger Plate.
11. Lifting Finger Operating Lever, right hand loom.
11a. " " " " left hand "
12. Operating Lever on Pad Finger, right hand loom.
12a. " " " " " left hand "
13. Operating Lever Plate.
14. Operating Lever Spring.
15. Operating Lever Throw Out.
16. Pad Finger (shipper end, right hand loom).
16a. " " (" " left hand ").
17. Operating Lever Pin.
18. Pad Finger (magazine end, right hand loom).
18a. " " (" " left hand ").
19. Pad Finger Stand (magazine end, right hand loom).
19a. " " " (" " left hand ").
20. " " " (shipper end, right hand loom).
20a. " " " (" " left hand ").
21. Swivel.
22. Upright (magazine end, right hand loom).
22a. " (" " left hand ").
23. " (shipper end, right hand loom).
23a. " (" " left hand ").
24. Weft Clearer (malleable iron).

25. Filling Cam.
26. Lever to Control Locking Lever (right hand loom).
26a. " " " " " (left hand ").
27. Operating Lever Extension.
28. Lever Extension Stud.
29. Special Screw for Locking Lever.
30. Lift Finger.
31. Lift Up Finger Collar.
32. Locking Lever, right hand loom.
32a. " " left hand "
33. Clutch Motion Operating Lever, right hand loom.
33a. " " " " left hand "
34. Operating Lever on Pad Finger (magazine end, right hand loom).
34a. " " " " " (" " left hand ").

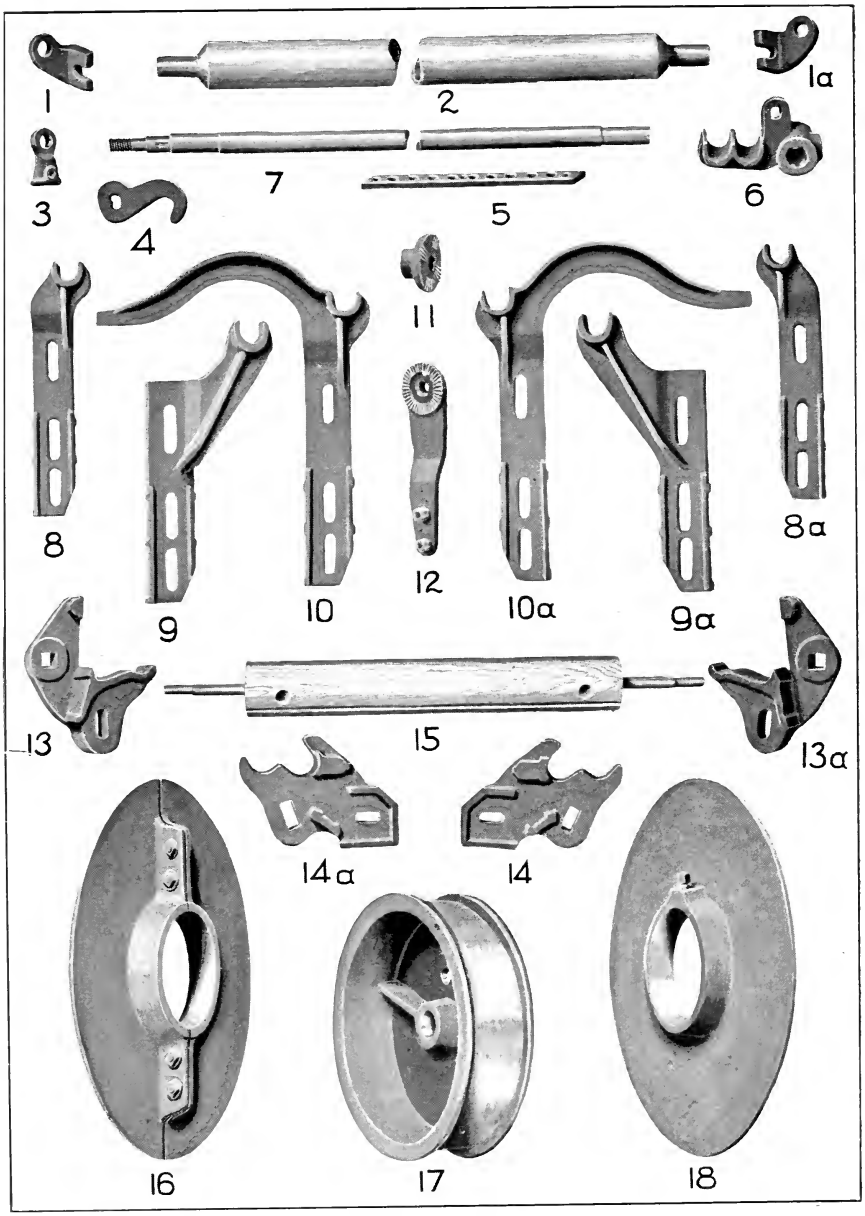


PLATE 27

Let-off Motion

Parts Common to Bartlett and Friction Types

PLATE 27

Parts Common to Bartlett and Friction Types

1. Spring Rod Stand, right hand.
1a. " " " left hand.
2. Whip Roll. (Specify size of loom.)
3. Swivel.
4. Beam Hook.
5. Plate for Adjustable Beam Head.
6. Whip Roll Bearing.
7. Whip Roll Shaft. (Specify size of loom.)
8. Whip Roll Bearing Support, right hand.
8a. " " " " left hand.
9. " " " " (offset right hand).
9a. " " " " (" left hand).
10. Whip Roll Bearing Support (with braces, right hand).
10a. " " " " (" " left hand).
11. Whip Roll Shaft Collar.
12. Whip Roll Lever.
13. Beam Bearing, right hand.
13a. " " left hand.
14. " " right hand.
14a. " " left hand.
15. Beam Barrel. (Specify size of loom.)
16. Beam Head, Split, Adjustable. (Specify diameter.)
17. Beam Friction.
18. Beam Head, Adjustable. (Specify diameter.)

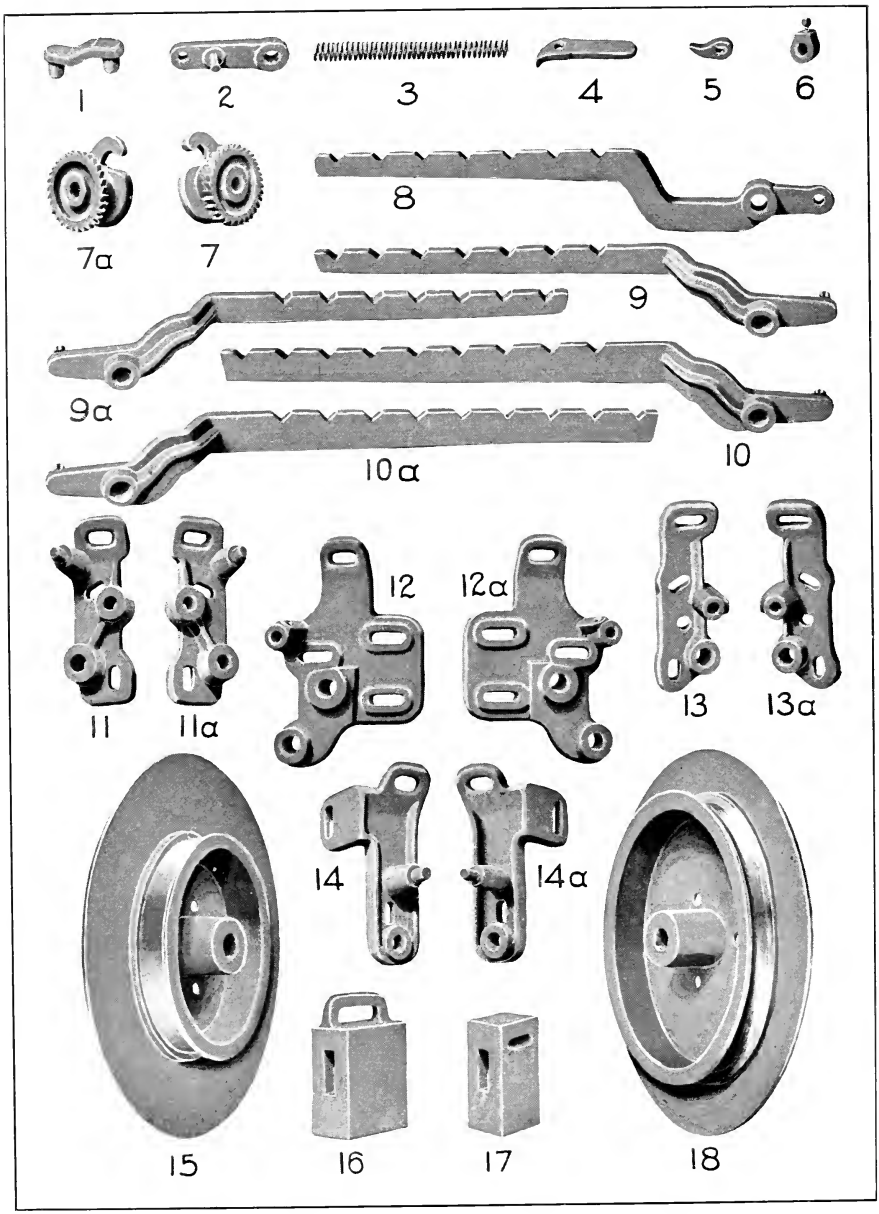


PLATE 28

Friction Let-off Motion

PLATE 28

1. Link (compound).
2. Lever (short compound).
3. Spring.
4. Ratchet Pawl (long).
5. " " (short).
6. Spring Rod Collar.
7. Ratchet, right hand.
7a. " left hand.
8. Weight Lever (compound).
9. " " (Plain, 62" loom and under, right hand).
9a. " " (" 62" " " " left hand).
10. " " (" 64" loom and over, right hand).
10a. " " (" 64" " " " left hand).
11. Lever Stand (compound, iron back girt, right hand).
11a. " " (" " " " left hand).
12. " " (" wood back girt, right hand).
12a. " " (" " " " left hand).
13. " " (Plain, iron back girt, right hand).
13a. " " (" " " " left hand).
14. " " (" wood back girt, right hand).
14a. " " (" " " " left hand).
15. Beam Head, $9\frac{1}{4}$" friction. (Specify outside dimensions.)
16. Weight (10 pounds).
17. " (5 ").
18. Beam Head, $13\frac{1}{2}$" friction. (Specify outside diameter.)

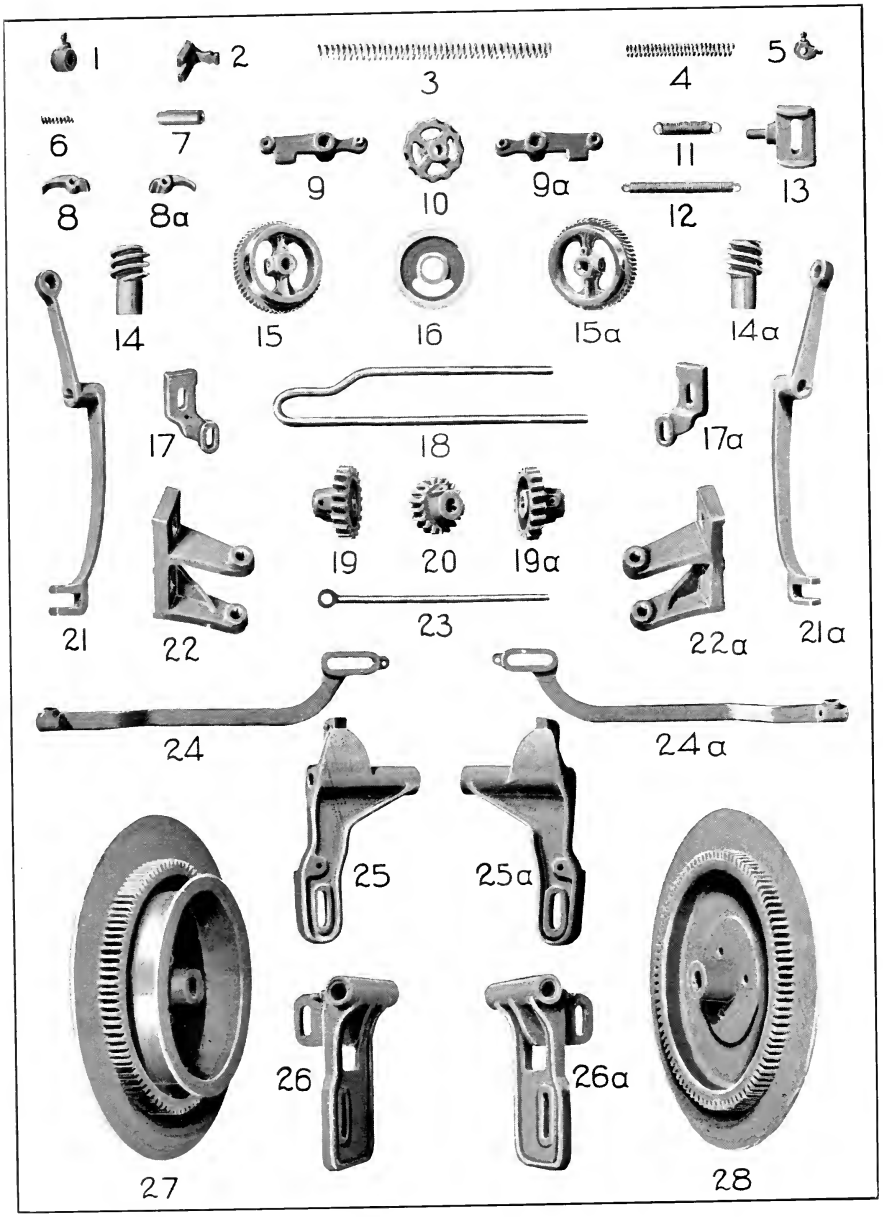


PLATE 29

Bartlett Let-off Motion

PLATE 29

1. Collar for Worm Shaft and Ratchet Lever Connector.
2. Spring Stand for Connector from Sword.
3. Let Off Spring (long).
4. " " " (short).
5. Let Off Spring Rod Collar.
6. Ratchet Pawl Spring.
7. Let Off Lever Bushing.
8. Ratchet Pawl, right hand loom.
8a. " " left hand loom.
9. Ratchet Pawl Lever, right hand loom.
9a. " " " left hand "
10. Hand Wheel.
11. Friction Spring.
12. Connector from Sword Spring.
13. Let Off Stand on Sword.
14. Let Off Worm, right hand loom.
14a. " " " left hand "
15. Ratchet, right hand loom.
15a. " left hand "
16. Guard for Friction Strap.
17. Let Off Lever Bracket, right hand loom.
17a. " " " " left hand "
18. Let Off Spring Rod.
19. Worm Wheel, right hand loom.
19a. " " left hand "
20. Let Off Pinion.
21. Let off Lever, right hand loom.
22. Worm Stand, right hand loom.
22a. " " left hand "
23. Malleable Iron Connector.
24. Connector from Sword, right hand loom.
24a. " " " left hand "
25. Let Off Pinion Bracket (iron back girt, right hand loom).
25a. " " " " (" " " left hand ").
26. " " " " (wood back girt, right hand loom).
26a. " " " " (" " " left hand ").
27. Beam Head, Combined Friction and Bartlett Let Off. (Specify diameter.)
28. " " Bartlett only. (Specify diameter.)

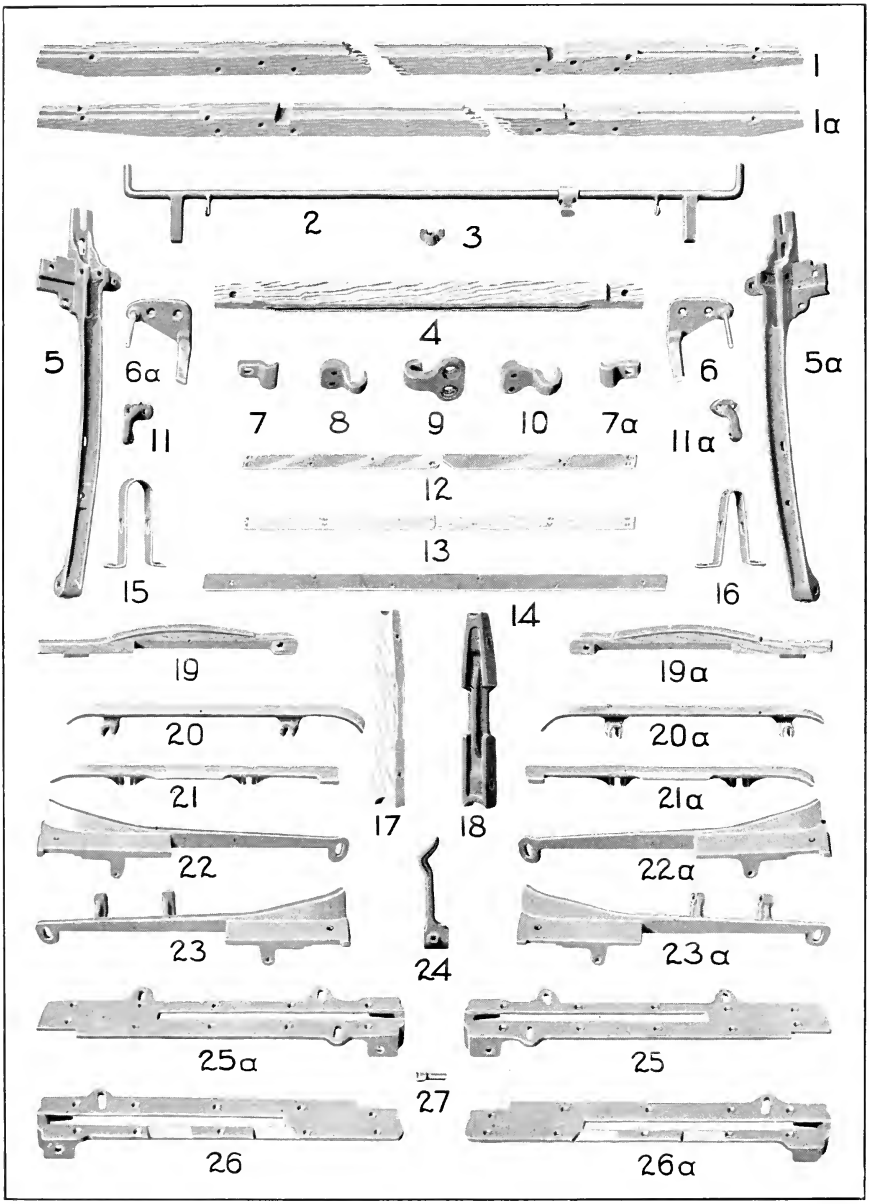


PLATE 30
LAY PARTS

PLATE 30

1. Lay, right hand loom.
1a. " left hand "
2. Protection Rod.
3. Hand Rail Thumb Nut.
4. Hand Rail.
5. Sword, right hand.
5a. " left hand.
6. Shuttle Guard on Lay, right hand.
6a. " " " " left hand.
7. Protection Rod Cap, right hand.
7a. " " " left hand.
8. Protection Rod Centre Bearing.
9. " " " "
10. " " " "
11. Shuttle Guard Stand for Bolts. (Specify end or centre.)
11a. " " " for Screws. (" " " " .)
12. Race Plate, steel. (Specify size of loom and number of filling forks.)
13. " " wood. (" " " " " " " " " .)
14. Stiffening Plate under Lay. (Specify size of loom.)
15. Sweep Strap Crank Bearing.
16. Sweep Strap Sword Bearing.
17. Sweep (wood).
18. " (iron).
19. Binder, right hand.
19a. " left hand.
20. Shuttle Box Front, driving end, right hand loom. (Specify shuttle size.)
20a. " " " " " left hand " (" " " .)
21. " " " magazine end, right hand loom. (Specify shuttle size.)
21a. " " " " " left hand " (" " " .)
22. Shuttle Box Back, driving end, right hand " (" " " .)
22a. " " " " " left hand " (" " " .)
23. " " " magazine end, right hand " (" " " .)
23a. " " " " " left hand " (" " " .)
24. Protection Rod Finger.
25. Lay Bottom, driving end, right hand loom. (Specify shuttle length.)
25a. " " " " left hand " (" " " .)
26. " " magazine end, right hand loom. (" " " .)
26a. " " " " left hand " (" " " .)
27. Binder Bushing.

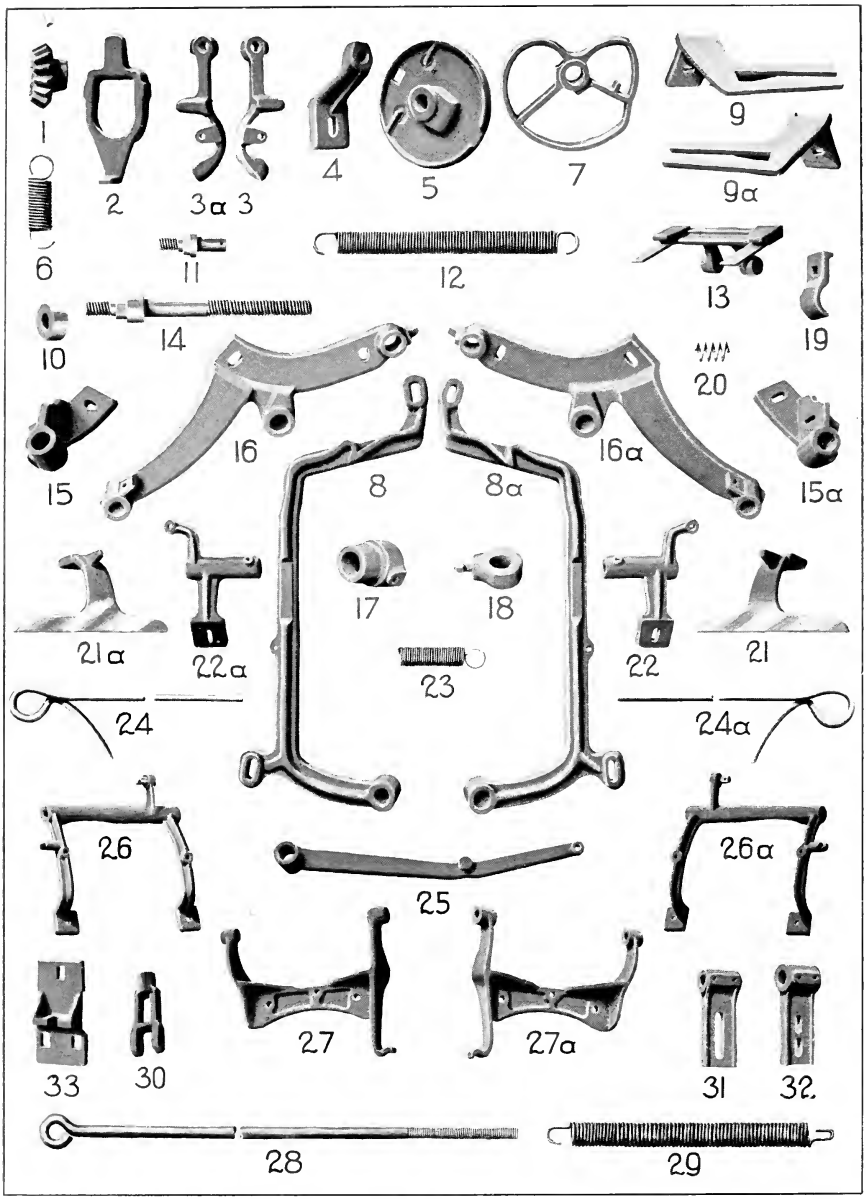


PLATE 31

Automatic Shuttle-changing Motion

PLATE 31

1. Bevel Gear.
2. Clutch.
3. Clutch Cam Lever, right hand loom.
3a. " " " left hand "
4. Clutch Cam Lever Bearing.
5. Clutch Disc.
6. Clutch Spring.
7. Conveyor Cam.
8. Conveyor Lever, right hand loom.
8a. " " left hand "
9. Conveyor Lever Guide, right hand loom.
9a. " " " left hand "
10. Conveyor Lever Roll.
11. Conveyor Lever Roll Stud.
12. Conveyor Lever Spring.
13. Conveyor Lever Top.
14. Conveyor Lever Top Stud.
15. Cross Shaft Bearing (driving end, right hand loom).
15a. " " " (" " left hand ").
16. " " " (magazine end, right hand loom).
16a. " " " (" " left hand ").
17. Cross Shaft Collar (magazine end).
18. " " " (driving end).
19. Cross Shaft Friction Strap.
20. Cross Shaft Friction Strap Spring.
21. Ejector Bottom, right hand loom.
21a. " " left hand "
22. Ejector Top, right hand loom.
22a. " " left hand "
23. Ejector Spring.
24. Filling Guide Wire, right hand loom.
24a. " " " left hand "
25. Front Board Cam Lever.
26. Front Board Lever, right hand loom.
26a. " " " left hand "
27. Front Board Lever Bearing, right hand loom.
27a. " " " " left hand "
28. Front Board Lever Connector.
29. Front Board Lever Spring.
30. Front Board Lever Turnbuckle.
31. Magazine Bearing ($\frac{3}{4}$ inch hole).
32. " " ($\frac{15}{16}$ " ").
33. Magazine Bearing Support.

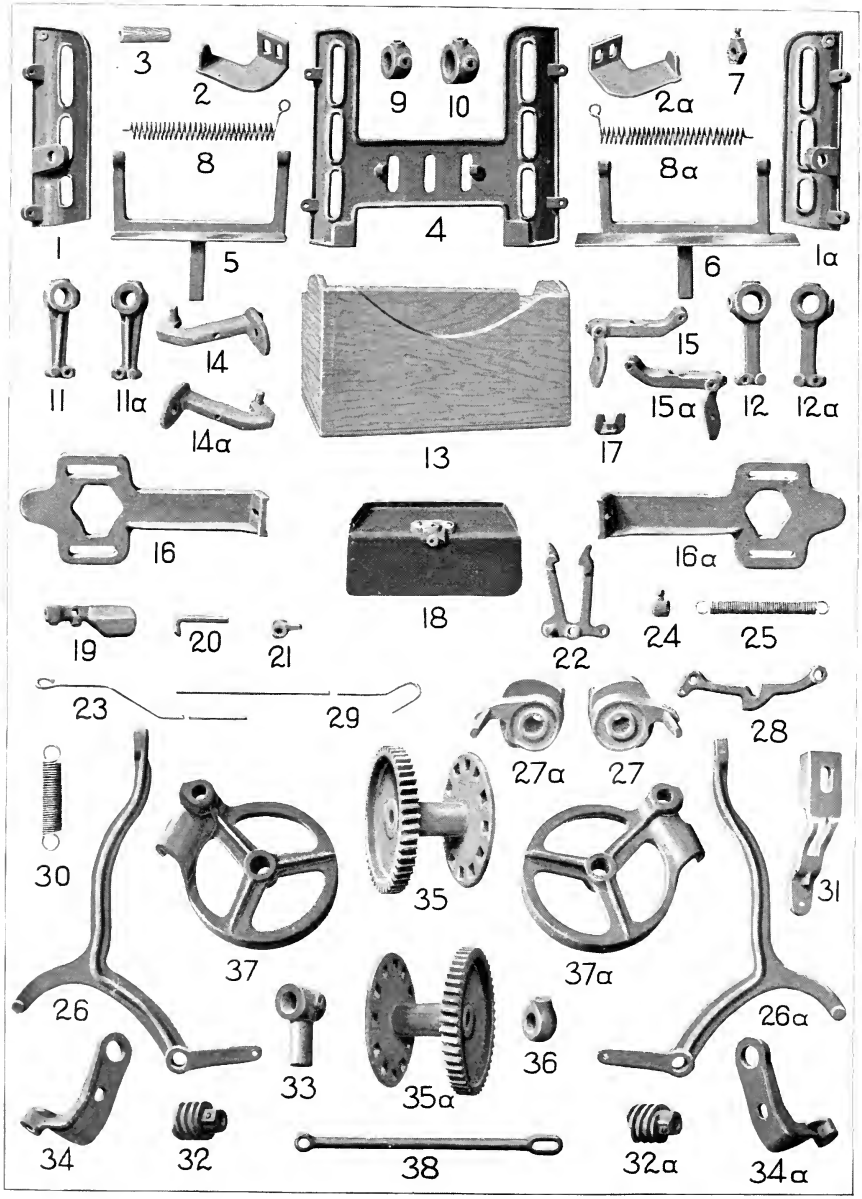


PLATE 32

Automatic Shuttle-changing Motion (continued)

PLATE 32

1. Magazine Back, right hand.
1a. " " left hand.
2. Magazine Bottom, right hand.
2a. " " left hand.
3. Magazine Filling Holder.
4. Magazine Front.
5. Magazine Latch.
6. " "
7. Magazine Latch Shaft Collar.
8. Magazine Latch Spring, right hand loom.
8a. " " " left hand "
9. Magazine Shaft Collar for $\frac{3}{4}$ inch shaft.
10. " " " " $\frac{15}{16}$ " "
11. Magazine Stop for $\frac{3}{4}$ inch shaft, right hand loom.
11a. " " " $\frac{3}{4}$ " " left hand "
12. " " " $\frac{15}{16}$ " " right hand "
12a. " " " $\frac{15}{16}$ " " left hand "
13. Receiver Box.
14. Receiver Box Bearing, right hand loom.
14a. " " " left hand "
15. " " " right hand "
15a. " " " left hand "
16. Receiver Box Support, right hand loom.
16a. " " " left hand "
17. Receiver Box Thumb Nut.
18. Receiver Gate.
19. Receiver Safety Lever.
20. Receiver Safety Lever Hook.
21. Receiver Safety Lever Stop.
22. Safety Lever.
23. Safety Lever Connector.
24. Safety Lever Connector Collar (also for starting pawl connector).
25. Safety Lever Spring.
26. Starting Lever, right hand loom.
26a. " " left hand "
27. Starting Cam, right hand loom.
27a. " " left hand "
28. Starting Pawl.
29. Starting Pawl Connector.
30. Starting Pawl Spring.
31. Starting Pawl Stop.
32. Worm, right hand loom.
32a. " left hand "
33. Worm Shaft Bearing (bottom).
34. " " " (top, right hand loom).
34a. " " " (top, left hand ").
35. Worm Wheel, right hand loom.
35a. " " left hand "
36. Worm Wheel Collar.
37. Worm Wheel Guard, right hand loom.
37a. " " " left hand "
38. Worm Wheel Guard Brace.

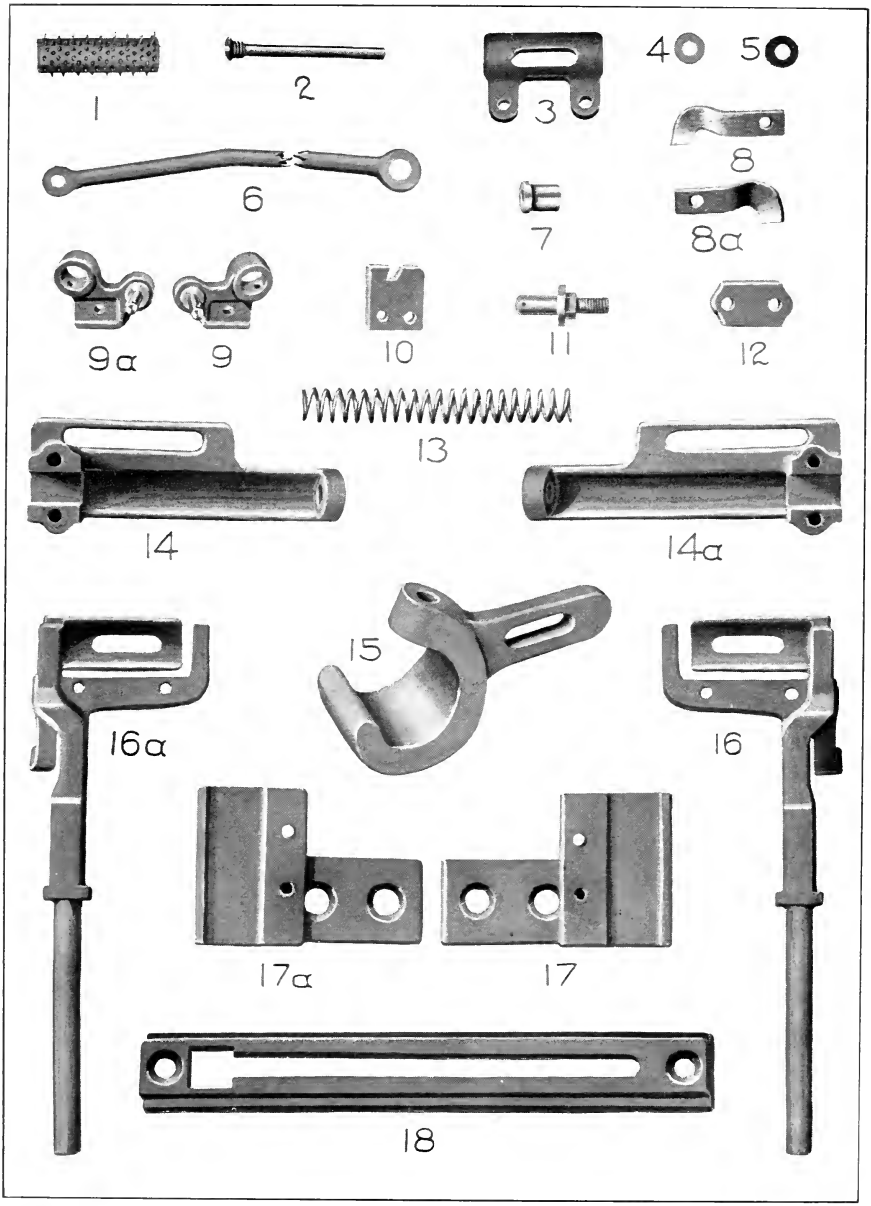


PLATE 33

Temple and Thread-cutter Parts

PLATE 33-c

1. Burr.
2. Burr Pin.
3. Burr Cap.
4. Brass Washer.
5. Steel Washer.
6. Cutter Connector.
7. Cutter Lever Bushing.
8. Cutter Knife, right hand loom.
8a. " " left hand "
9. Cutter Lever, right hand "
9a. " " left hand "
10. Cutter Plate.
11. Cutter Lever Stud.
12. Box Cap.
13. Spring.
14. Box, right hand loom.
14a. " left hand "
15. Cutter Lever on Rocker Shaft.
16. Pod, right hand.
16a. " left hand.
17. Rest, right hand.
17a. " left hand.
18. Slide.

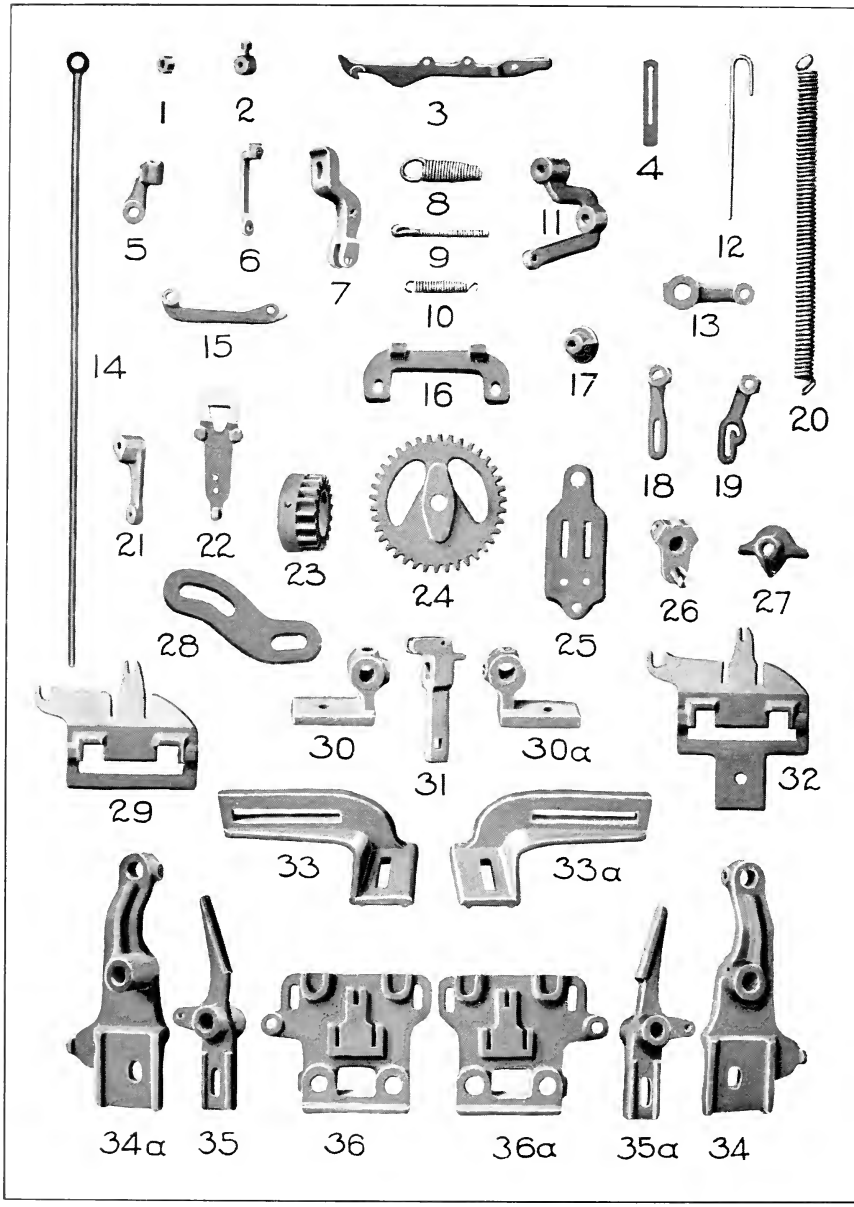


PLATE 34

Warp-stop Motion

PLATE 34

1. Connector Bushing.
2. Collar for Wire Connector.
3. Knock Off Pawl.
4. Drop Wire.
5. Crank Swivel.
6. Connector to Lift Pawl.
7. Knock Off Latch.
8. Knock Off Latch Spring.
9. Knock Off Latch Adjusting Screws.
10. Release Lever Spring.
11. Knock Off Collar.
12. Wire Connector.
13. Operating Shaft End Bearing.
14. Connector.
15. Sliding Bar Connector.
16. Bracket Cap.
17. Operating Shaft Collar.
18. Lever to Lift Pawl.
19. " " " "
20. Cam Lever Spring.
21. Sliding Bar Lever.
22. Spring Release Lever.
23. Driving Gear.
24. Driven Gear.
25. Drawing-in Frame.
26. Operating Crank.
27. Spring Release Lever Stop.
28. Centre Bracket Brace.
29. Heddle Bar Brace.
30. Bracket Support, right hand.
30a. " " left hand.
31. Cam Lever Top.
32. Centre Bracket.
33. Intermediate Bracket, left hand.
33a. " " right hand.
34. Driven Gear Stand, right hand loom.
34a. " " " left hand "
35. Cam Lever, left hand loom.
35a. " " right hand "
36. Bracket, right hand.
36a. " left hand.

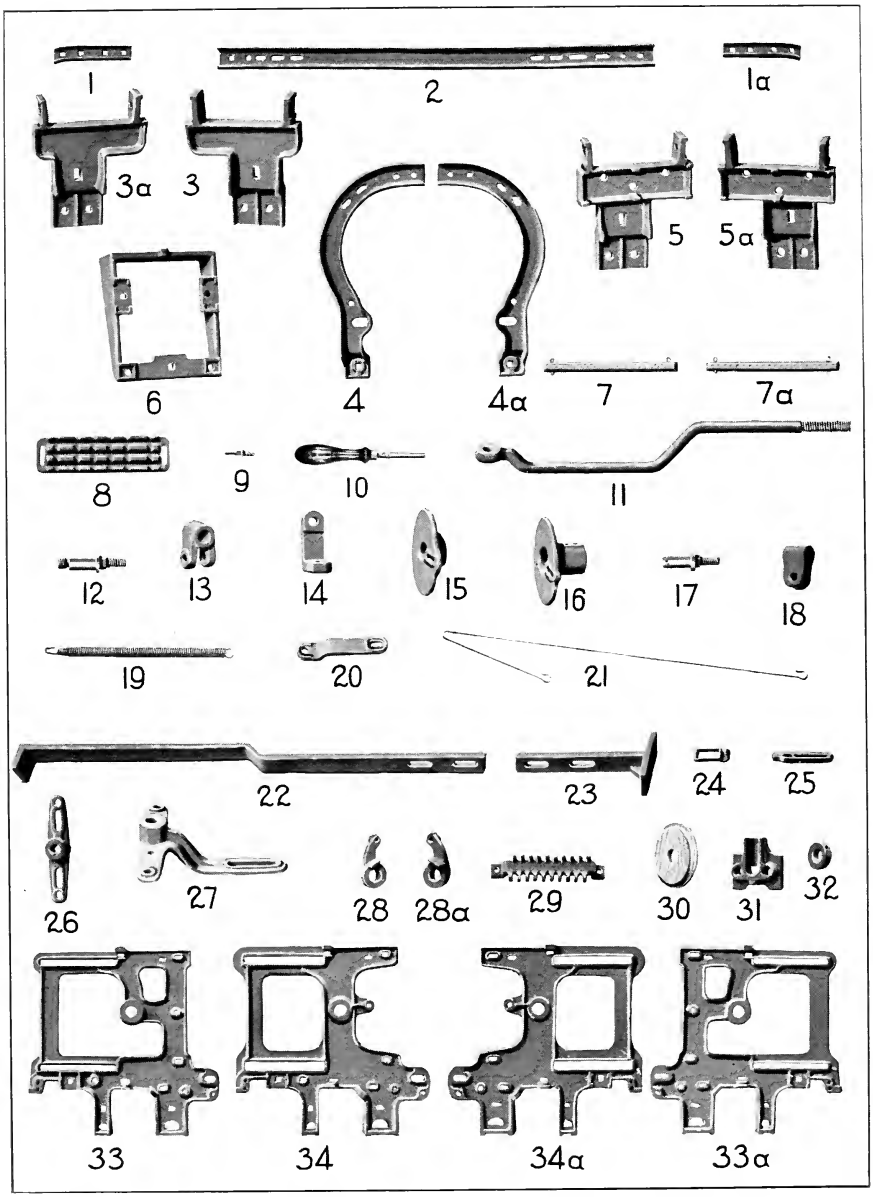


PLATE 35

Dobby Fittings

PLATE 35

1. Arch Tie, right hand.
1a. " " left hand.
2. Arch Rail. (Specify length.)
3. Arch Stand, right hand. (Specify number of harnesses.)
3a. " " left hand. (" " " " .)
4. Arch End (right hand loom back and left hand loom front).
4a. " " (left hand " " " right hand " ").
5. Dobby Support right hand. (Specify number of harnesses.)
5a. " " left hand. (" " " " .)
6. Dobby Bracket.
7. Chain Bar, double index. (Specify number of harnesses.)
7a. " " single " (" " " " .)
8. Chain Bar Die.
9. Chain Bar Peg.
10. Chain Bar Peg Wrench.
11. Connector.
12. Connector Stud (top).
13. Connector Swivel (top).
14. Connector Swivel Extension.
15. Crank Plate.
16. Crank Plate (offset).
17. Crank Plate Stud.
18. Crank Plate Swivel.
19. Direct Spring.
20. Dobby Tie.
21. Harness Wire. (Specify size of loom and distance between harness eyes.)
22. Leg.
23. Leg Foot.
24. Link of Driving Chain. (Specify number of links.)
25. Loop.
26. Front Rocker.
27. Back Rocker.
28. Shieve Wire Support (right hand loom front and left hand loom back).
28a. " " " (left hand " " " right hand " ").
29. Spring Block. (Specify number of harnesses.)
30. Shieve.
31. Shieve Stand.
32. Shieve Shaft Collar.
33. Side (right hand loom front and left hand loom back).
33a. " (left hand " " " right hand " ").
34. " (right hand " " " left hand " ").
34a. " (left hand " " " right hand " ").

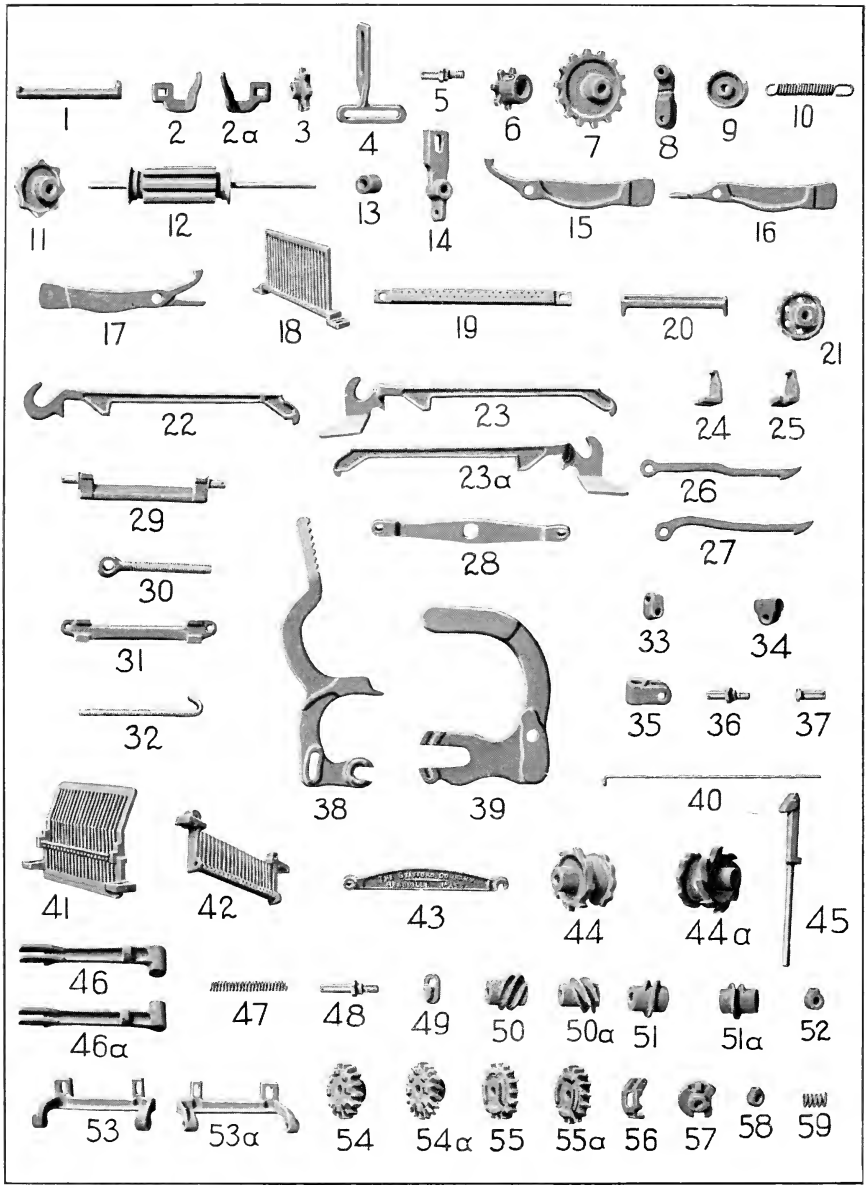


PLATE 36

Dobby Parts

PLATE 36

1. Angular Girt. (Specify number of harnesses.)
2. Chain Clearer, right hand loom (front side of dobby).
2a. " " left hand " (" " " ").
3. Chain Idler. 4. Chain Idler Stand. 5. Chain Idler Stud.
6. Chain Wheel, 7 tooth for crank shaft.
7. " " 14 " " " "
8. Check Roll Arm. 9. Check Roll. 10. Check Roll Spring.
11. Check Wheel.
12. Cylinder. (Specify number of harnesses.)
13. Cylinder Shaft Collar. 14. Cylinder Shaft Box.
15. Finger (bottom double index).
16. " (top double index).
17. " (single index).
18. Finger Guide (single index, specify number of harnesses).
19. " " (double index, " " " ").
20. Girt. (Specify number of harnesses.)
21. Hand Wheel.
22. Harness Leveller. (Worm driven cylinder, specify number of harnesses.)
23. " " (Pawl driven cylinder, right hand, specify number of harnesses.)
23a. Harness Leveller. (Pawl driven cylinder, left hand, specify number of harnesses.)
24. Harness Leveller Stand. 25. Harness Leveller Stand.
26. Hook (bottom). 27. Hook (top).
28. Jack Back.
29. Knife. (For swivel, specify number of harnesses.)
30. Knife Connector.
31. Knife (without swivel, specify number of harnesses).
32. Knife Hook. 33. Knife Hook Swivel.
34. Knife Connector Swivel. 35. Knife Swivel.
36. Knife Connector Swivel Stud. 37. Knife Connector Swivel Pin.
38. Lever. 39. Lever Guide. 40. Needle.
41. Rack (bottom, specify number of harnesses).
42. " (top, " " " ").
43. Rack Cap (Top, " " " ").
44. Ratchet and Hand Wheel, left hand loom.
44a. " " " " right hand "
45. Ratchet Pawl.
46. Ratchet Pawl Holder, right hand loom.
46a. " " " left hand "
47. Ratchet Pawl Spring.
48. Ratchet Pawl Stud.
49. Washer.
50. Worm (without dwell, right hand loom).
50a. " (" " left hand ").
51. " (with dwell, right hand loom).
51a. " (" " left hand ").
52. Worm Shaft Collar.
53. Worm Stand, right hand loom.
53a. " " left hand "
54. Worm Wheel (double index), right hand.
54a. " " (" "), left hand.
55. " " (single index), right hand.
55a. " " (" "), left hand.
56. Worm Wheel Clutch. 57. Worm Wheel Clutch Hub.
58. Worm Wheel Clutch Collar. 59. Worm Wheel Clutch Spring.

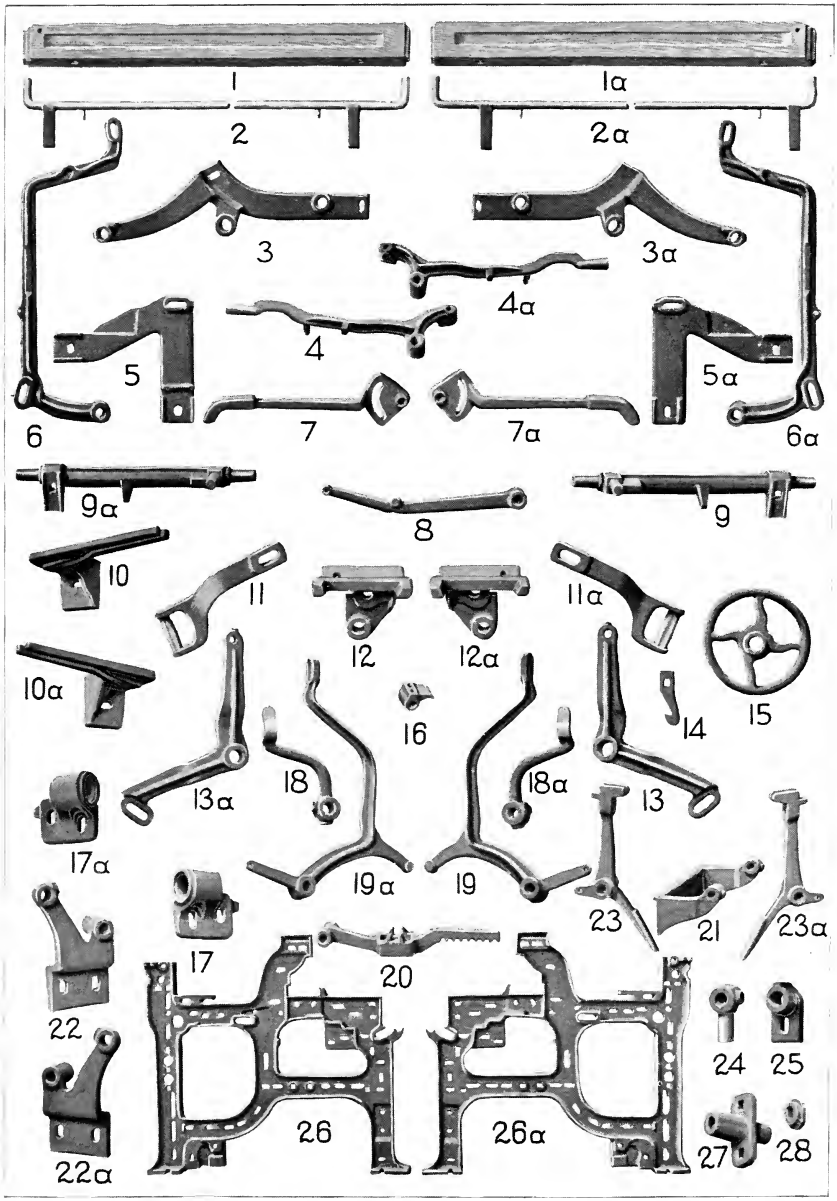


PLATE 37

PARTS SPECIAL FOR No. 2 MODEL

For other parts see preceding plates

PLATE 37

1. Breast Beam, right hand loom. (Specify size of loom.)
1a. " " left hand " (" " " " ".)
2. Protection Rod, right hand loom. (Specify size of loom.)
2a. " " left hand " (" " " " ".)
* 3. Cross Shaft Bearing (magazine end, right hand loom).
* 3a. " " " (" " left hand ").
4. Brake Lever, right hand loom.
4a. " " left hand "
5. Brake Shoe Bracket, right hand.
5a. " " " left hand.
* 6. Conveyor Lever, right hand loom.
* 6a. " " left hand "
7. Filling Cam Lever, right hand.
7a. " " " left hand.
* 8. Front Board Cam Lever.
* 9. Pick Shaft, right hand.
* 9a. " " left hand.
*10. Conveyor Lever Guide, right hand loom.
*10a. " " " left hand "
11. Pick Shaft Arm, right hand.
11a. " " " left hand.
12. Shipper Shaft Bearing (shipper end, right hand loom).
12a. " " " (" " left hand ").
*13. Shipper Lever, right hand loom.
*13a. " " left hand "
*14. Shipper Handle Extension.
*15. Hand Wheel.
*16. Knock Off Lever.
17. Pick Shaft Box (back), right hand.
17a. " " " ("), left hand.
*18. Protection Rod Finger (shipper end, right hand loom).
*18a. " " " (" " left hand ").
19. Starting Lever, right hand loom.
19a. " " left hand "
20. Treadle.
21. Treadle Stand.
*22. Warp Stop Driven Gear Stand, right hand loom.
*22a. " " " " " left hand "
*23. Warp Stop Knock Off Cam Lever, right hand loom.
*23a. " " " " " " left hand "
*24. Worm Shaft Bearing.
*25. Worm Shaft Bearing Support.
26. Sides, right hand.
26a. " left hand.
*27. Worm Wheel Stand.
28. Washer for Receiver Box Bracket.

* Also for No. 3 Model.

For Other Parts see Preceding Plates

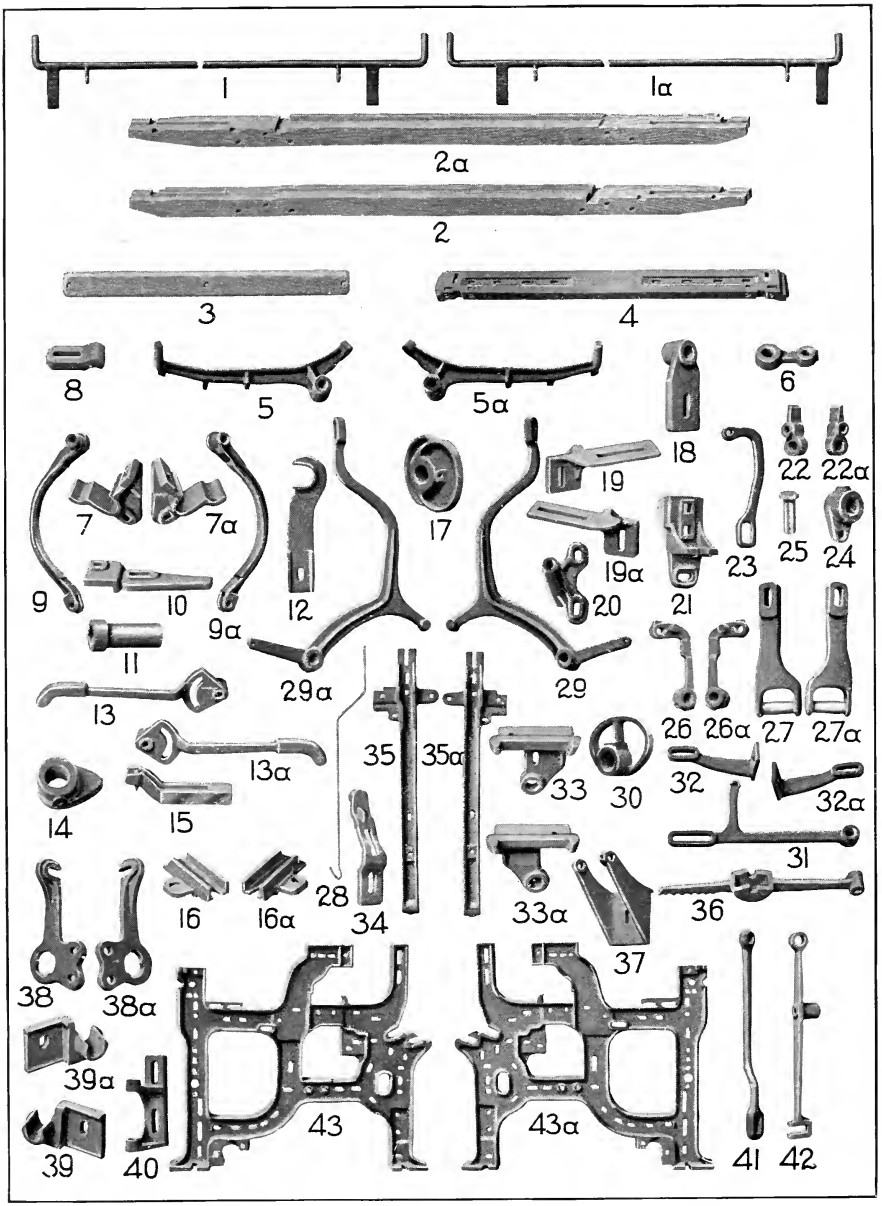


PLATE 38

PARTS SPECIAL FOR NO. 3 MODEL

For other parts see preceding plates

PLATE 38

1. Protection Rod (right hand loom. Specify size of loom).
1a. " " (left hand " " " " ").
2. Lay (right hand loom. Specify size of loom).
2a. " (left hand " " " " ").
3. Breast Beam Board. 4. Breast Beam.
5. Brake Lever, right hand loom.
5a. " " left hand "
6. Brake Lever Brace.
7. Beam Bearing, right hand. 7a. Beam Bearing, left hand.
8. Beam Bearing Cap.
9. Brake Shoe, right hand loom.
9a. " " left hand "
10. Brake Shoe Bracket. 11. Brake Shoe Bushing.
12. Bottom Shaft Hook.
13. Filling Cam Lever, right hand loom.
13a. " " " left hand "
14. Filling Fork Cam. 15. Filling Fork Holder.
16. Filling Fork Guide, right hand loom.
16a. " " " left hand "
17. 2 Harness Cam.
18. Auxiliary Shaft Bearing.
19. Intermediate Warp Stop Bracket, right hand.
19a. " " " " left hand.
20. Let Off Pinion Bracket. 21. Magazine Bearing Support.
22. Operating Lever on Pad Finger, right hand loom.
22a. " " " " " left hand loom.
23. Operating Lever Throw Out.
24. Operating Lever Throw Out Lever.
25. Operating Lever Throw Out Lever Pin.
26. Pad Finger, right hand loom.
26a. " " left hand "
27. Pickshaft Arm, right hand.
27a. " " left hand.
28. Starting Pawl Connector.
29. Starting Pawl Lever, right hand loom.
29a. " " " left hand "
30. Selvage Motion Cam. 31. Selvage Motion Lever.
32. Selvage Motion Stand, right hand.
32a. " " " left hand.
33. Shipper Shaft Bearing, right hand loom.
33a. " " " left hand "
34. Stop for Starting Pawl.
35. Sword, right hand. 35a. Sword, left hand.
36. Treadle (2 harness).
37. Treadle Stand.
38. Upright Support, right hand loom.
38a. " " left hand "
39. Whip Roll Bearing Support, right hand.
39a. " " " " left hand.
40. Worm Stand.
41. Worm Wheel Guard Brace.
42. Vertical Lever (Bartlett Let Off).
43. Side, right hand. 43a. Side, left hand.

For Other Parts see Preceding Plates

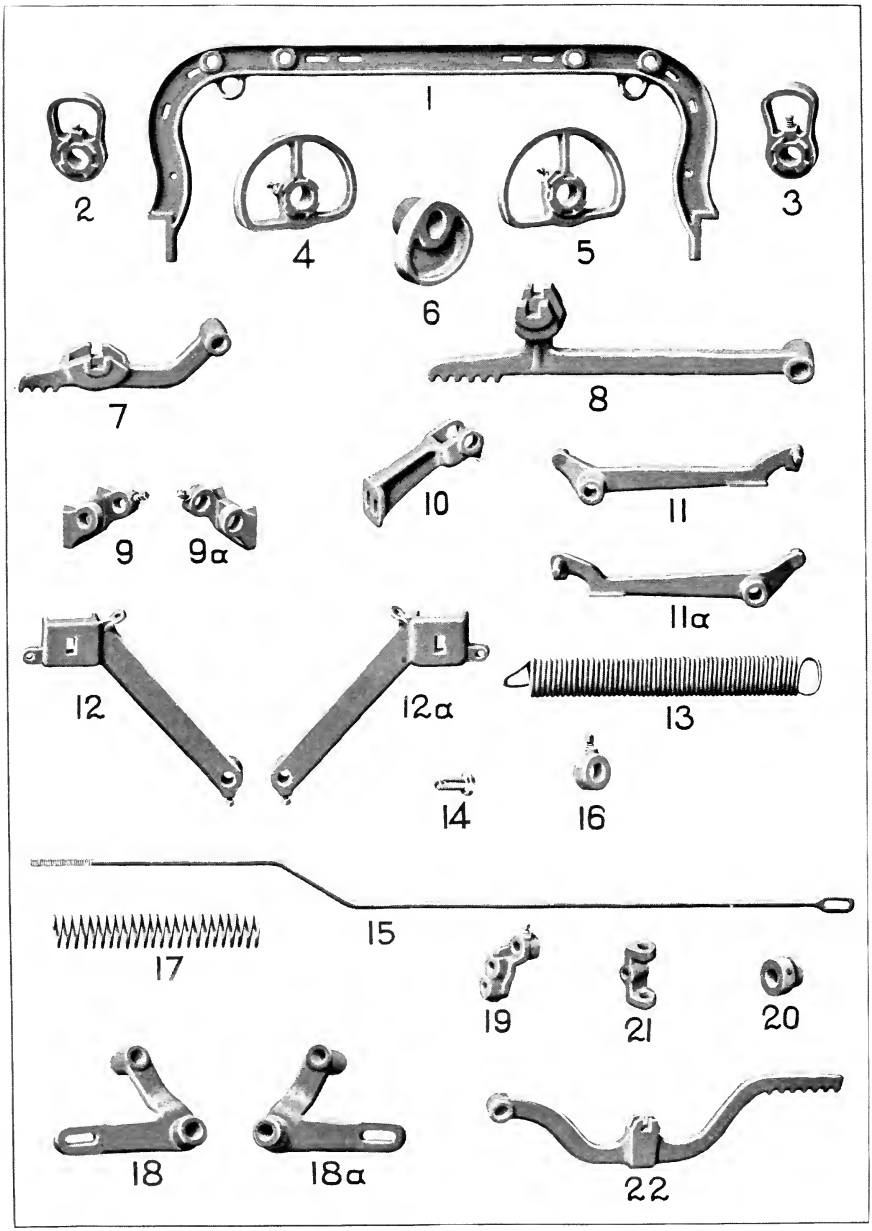


PLATE 39

PARTS SPECIAL FOR PILLOW-TUBE MOTION

See also Plate 23

PLATE 39

1. Arch. (Specify size of loom.)
2. Harness Cam, No. 1.
3. " " No. 2.
4. " " No. 3.
5. " " No. 4.
6. Roller Motion Cam.
7. Roller Motion Treadle, No. 1 Model.
8. " " " No. 3 "
9. Roller Motion Treadle Stand, No. 3 Model, right hand loom.
9a. " " " " No. 1 " left hand "
10. " " " " No. 1 "
11. Roll Pressure Lever, right hand.
11a. " " " left hand.
12. Pressure Lever Stand, right hand.
12a. " " " left hand.
13. Pressure Lever Spring.
14. " " Stop.
15. Roller Motion Connector.
16. Roller Motion Connector Collar.
17. Roller Motion Connector Spring.
18. Operating Lever, right hand loom.
18a. " " left hand. "
19. Roll Lever.
20. Roll.
21. Swivel.
22. Harness Motion Treadle.

See also Plate 23

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