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A.D. 1838 . . . . . N<sup>o</sup> 7898.

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**Manufacture of Coke, &c.**

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**NEVILLE'S SPECIFICATION.**

**TO ALL TO WHOM THESE PRESENTS SHALL COME, I, FREDERICK NEVILLE, of Pancras Lane, in the City of London, Merchant, send greeting.**

**WHEREAS** Her present most Excellent Majesty Queen Victoria, by Her Letters Patent under the Great Seal of Great Britain, bearing date at Westminster, the Sixth day of December, in the second year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Frederic Neville, my eñors, adñors, and assigns, Her especial licence, full power, sole privilege and authority, that I, the said Frederick Neville, my eñors, adñors, and assigns, and such others as I, the said Frederick Neville, 10 my eñors, adñors, and assigns, should at any time agree with, and no others, from time to time and at all times hereafter during the term of years therein mentioned, should and lawfully might make, use, exercise, and vend, within England, Wales, and the Town of Berwick-upon-Tweed, and also in all Her Majesty's Colonies and Plantations abroad, the Invention communicated to me 15 by a certain Foreigner residing abroad, of "AN IMPROVED METHOD OR PROCESS OF MANUFACTURING COKE, WHEREBY THE SAL AMMONIAC, BITUMEN GASES, AND OTHER RESIDUOUS PRODUCTS OF COAL ARE AT THE SAME TIME SEPARATELY COLLECTED, AND THE HEAT EMPLOYED IN THE PROCESS IS APPLIED TO OTHER USEFUL PURPOSES;"

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in which said Letters Patent is contained a proviso that I, the said Frederick Neville, shall cause a particular description of the nature of the said Invention communicated to me, and of the manner in which the same is to be performed, to be inrolled in Her said Majesty's High Court of Chancery within six calendar months next immediately after the date of the said in part recited 5 Letters Patent, reference being thereunto had, will more fully and at large appear.

**NOW KNOW YE**, that in compliance with the said proviso, I, the said Frederick Neville, do hereby declare that the Invention communicated to me consists,— 10

First, in an improved method or process of manufacturing coke by the use of coke ovens, constructed, arranged, and worked in the manner herein-after described, whereby the heat evolved in the process of combustion, instead of being wasted as in ordinary coke ovens, is applied to the distillation from coal of sal ammonia, bitumen gases, and other residuous products of coal, and the 15 said products are collected separately from the coke.

And secondly, in the improved coke ovens, herein-after also described, in which the heat of the coke ovens is employed for the purpose of melting and solidifying or caking small coal, with a view of its being formed into a fuel occupying in quality and character a medium station between coal and coke, 20 and which caked small coal will be found of great utility both for domestic and for manufacturing purposes.

And firstly, as to the improved coke ovens, whereby the heat evolved in the process of combustion is employed in the distillation of coal, and the products thereof are collected separately from the coke. The construction, 25 arrangement, and mode of working the same are fully shewn in the Sheet of Drawings marked Number I., hereunto annexed, Figure 1 being a plan of said coke ovens; Figure 2 a front elevation thereof in the line A, B, of the plan; Figure 3 a cross section through the line C, D, of the plan; and Figure 4 a longitudinal section through the line E, F, 30 of the plan. The same letters of reference denote similar parts in all these Figures. G is the interior of the oven into which the coal to be coked is thrown; H, H, H, H, H, H, are six retorts, similar to those ordinarily used in the manufacture of coal gas, placed in the form of a flat arch, over the oven, and occupying the place of the roof in coke ovens as com- 35 monly constructed. These retorts are supported by their ends resting on the back and front walls of the furnace, as at I and K in Figure 4. The retorts communicate by means of the pipes L, M, with the main N, which conveys

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the sal ammonia, bitumen gas, and other residuous products of coal generated in the retorts to the gasometer and other receptacles and reservoirs provided for the same. There are small spaces left between the retorts to allow of the free circulation of the flame and hot air or vapour from the coking coal around them, and under the top arch of fire brick O, O. P is the door of the oven or furnace through which coal is supplied and the coke withdrawn. Q, Q, is the flue rising from about the middle of the furnace or oven leading to the chimney R. S, a small flue in the brickwork surrounding the oven, by means of which a sufficient portion of atmospheric air is supplied to support the combustion of the coal in the oven G through the apertures T, T, T. The retorts are charged and emptied in the way usually pursued in gas works. According to the practice followed abroad, the retorts are charged and worked off in about every four hours and a half, while the coal in the oven is not converted into coke sooner than in about forty hours, so that the operation of distilling the coal, and obtaining therefrom its various volatile and liquid products, may be carried on with one interruption only in about forty hours, and that of a very short duration.

The Sheet of Drawings marked No. II. shews another arrangement of gas retorts placed over a coke oven. Figure 1 is a plan. Figure 2 a front view in the line A, B, in Figure 1. Figure 3 is a back view in the line C', D', of Figure 1. Figure 4 a section through the line C, D, of Figure 1; and Figure 5 a section through the line E, F, of Figure 1. The several parts of these Figures are similar to those in the Figures in the Drawing No. 1, and are pointed out and distinguished by like letters of reference. The object of this different arrangements of the retort is to obviate any danger which might exist of the retorts yielding in the middle from the intensity of the heat to which they are exposed, and from their being supported at the two ends only. Above the coke oven there are placed six narrow flat arches U, U, U, U, U, U, Figures 4 and 5, and on the crown of each of these arches rests the middle of one of the retorts H, which are also supported at their ends by the walls of the furnace, as shewn in Drawing Number 1. The flat arches for supporting the retorts are strengthened laterally by the counter pieces V, V, V, V, so that the whole six narrow arches form one large arch perforated throughout with apertures placed between the coking coal and the retorts, the flame and heat from the coking coal passing through these apertures, and round and about the retorts, as described with respect to the arrangement shewn by the Sheet of Drawings marked No. 1. The gas, ammonia, and other products of distillation are carried off by the pipes L, M, to the main N, also in the same.

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manner; but these pipes, as well as the mouths of the retorts, are placed at a different end of the furnace from that of which the door of the coke oven is placed, and not at the same end, as in the modification shewn in Sheet Number I. of the Drawings hereunto annexed. The arrangement of retorts over a coke oven shewn in Sheet of Drawings Number II., will allow of the use of a much more intense heat being used for the distillation of coal than in the other, where the retorts are not supported in the middle. 5

Secondly, as to the improved coke oven or furnace in which the heat evolved in the coking of coals is applied to the purpose of the melting, solidifying, or caking of small coal, with a view to rendering it of greater utility than if used in its pulverized state for domestic and manufacturing purposes. 10

In the Sheet of Drawings marked No. III. Figure 1 is a sectional plan of the coke oven. Figure 2 is a plan of the top of the coke oven, the parts colored red being sections of the superposed oven or furnace, in which the small coal is placed to be melted for the purpose of caking. Figure 3 is a plan of the combined surfaces or ovens. Figure 4 is an elevation of the combined furnaces in the line A, B, of Figure 1. Figure 5 is a section through the line C, D, of Figure 2. Figure 6, a section through the line E, F, of Figure 1. Figure 7, a section through the line G, H, of Figure 1. Similar letters of reference denote the same parts in these several Figures. I, I, are the coke ovens. K, K, the doors of the coke ovens. L, L, flues to supply air to keep up the combustion. M, M, openings in the crowns of the coke ovens leading by the horizontal passages N, N, into the superposed caking oven O, O, which is placed over the hinder part of the coke ovens I, I. P is the flue in the top of the caking oven leading to the chimney. Q, Q, are apertures in the top of the caking oven. R, R, doors or openings into the caking oven. 25

The process to be followed in caking the small coal is as follows:—The top arch of the coke ovens and body of the furnace having become red hot by the caloré evolved in the coke ovens, the small coal is to be thrown into the caking oven O, O, by the square apertures Q, Q; in a few minutes it will assume a kind of plastic state, it is then to be taken out and put into the moulds of the form represented in the Figures 8, 9, 10, and 11, or of any other suitable form. These moulds may be made of any desired or convenient size, and of wrought or cast iron. Figure 8 is a side section. Figure 9 a plan. Figure 10, the side *a*, shewing the way in which the cross bar *c* is hinged; and Figure 11, 35 the side *b*, shewing the way in which the loose end of the cross bar is fixed into the staple *e*. The lid or cover *f* of this mould fits into the interior, acting like a piston when moved up or down by the screw *g* and cross head *h*; the

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screw *g* is shaped into a hole in the cross bar *c*. The cover or lid *f* of the mould, with the cross bar and screw being turned back, the mould is filled with the half melted small coal, which is in a spongy or pulpy state; the cover *f* is then turned upon it, the cross bar *c* made fast in the staple *e*, and by turning  
5 the screw *g* by the handle *h* the plastic small coal is pressed into a complete mass or cake; the mould and cake of coal is then left to cool for about an hour, when the mould may be opened and the cake withdrawn.

And having now fully described the said Invention, communicated to me by a Foreigner residing abroad as aforesaid, I declare that what I claim as new  
10 is, the improved method or process of manufacturing coke herein-before described, whereby,—

Firstly, the heat evolved in the coking process is applied to the distilling of coal, and the products obtained by such distillation are collected separately from the coke, and whereby,

15 Secondly, the heat evolved in the coking process is employed in the caking or solidification of small coal. And I declare that I do not claim either of the processes herein-before described of manufacturing coke, distilling coal, and gathering the products of distillation, or of caking small coal separately, or in themselves, or otherwise than as combined together, that is to say, the  
20 manufacture of coke in coke ovens, with the distillation of coal in retorts, or the manufacture of coke with the caking of small coal; neither do I confine myself to the precise shape, arrangement, proportions of parts or sizes set forth or exhibited in the Drawings hereunto annexed, or to any particular number of ovens to be worked together or in connection with one another.

25 And such the said Invention being, to the best of my knowledge and belief, new, and never before used within that part of Her Majesty's United Kingdom of Great Britain and Ireland called England, Her Dominion of Wales, Town of Berwick-upon-Tweed, or in Her Colonies or Plantations abroad, I do hereby declare this to be my Specification of the same, and that I do verily  
30 believe this my Specification doth comply in all respects fully and without reserve or disguise with the proviso in the said herein-before in part recited Letters Patent contained; wherefore I hereby claim to maintain exclusive right and privilege to the said Invention.

In witness whereof, I, the said Frederick Neville, have hereunto set  
35 my hand and seal, this Sixth day of June, in the year of our Lord One thousand eight hundred and thirty-nine.

FREDERICK (L.S.) NEVILLE.

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FARRER.

AND BE IT REMEMBERED, that on the Sixth day of June, in the year of our Lord 1839, the aforesaid Frederick Neville came before our said Lady the Queen in Her Chancery, and acknowledged the Specification aforesaid, and all and every thing therein contained and specified, in form above written. And also the Specification aforesaid was stamped according to the tenor of the Statute made for that purpose. 5

Inrolled the Sixth day of June, in the year of our Lord One thousand eight hundred and thirty-nine.

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LONDON:

Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,  
Printers to the Queen's most Excellent Majesty. 1857.

Section at C.B.

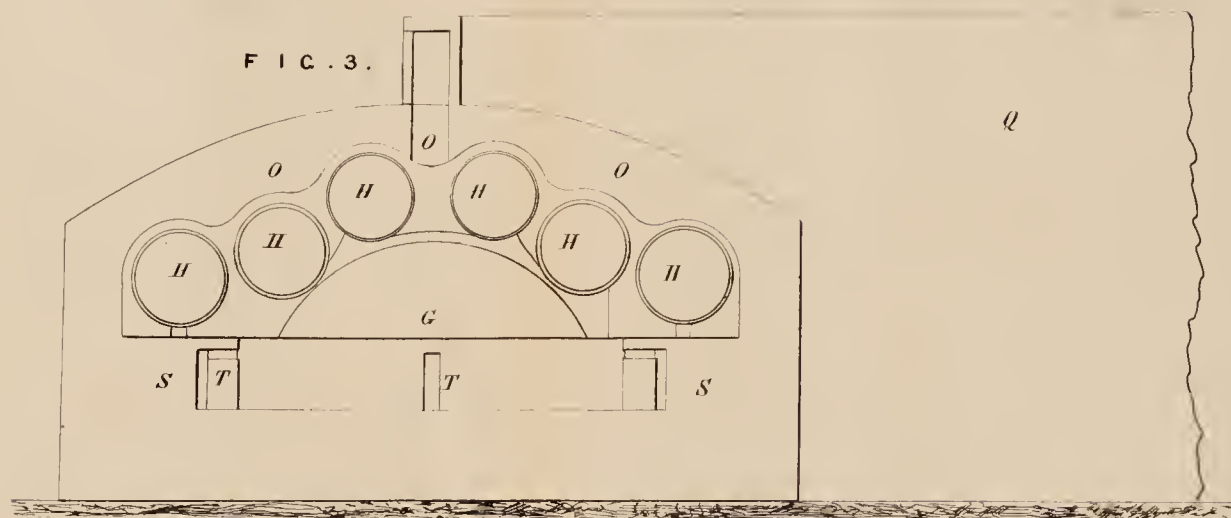


FIG. 4.  
Section at E.F.

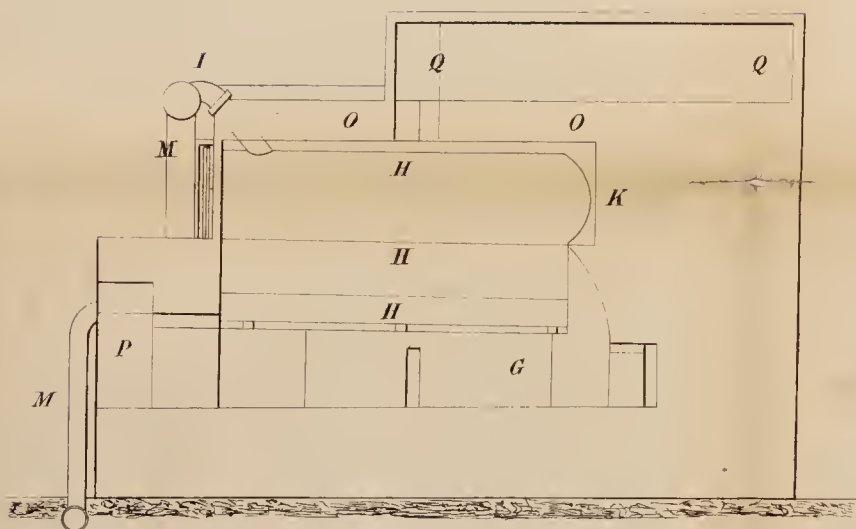


FIG. 2.

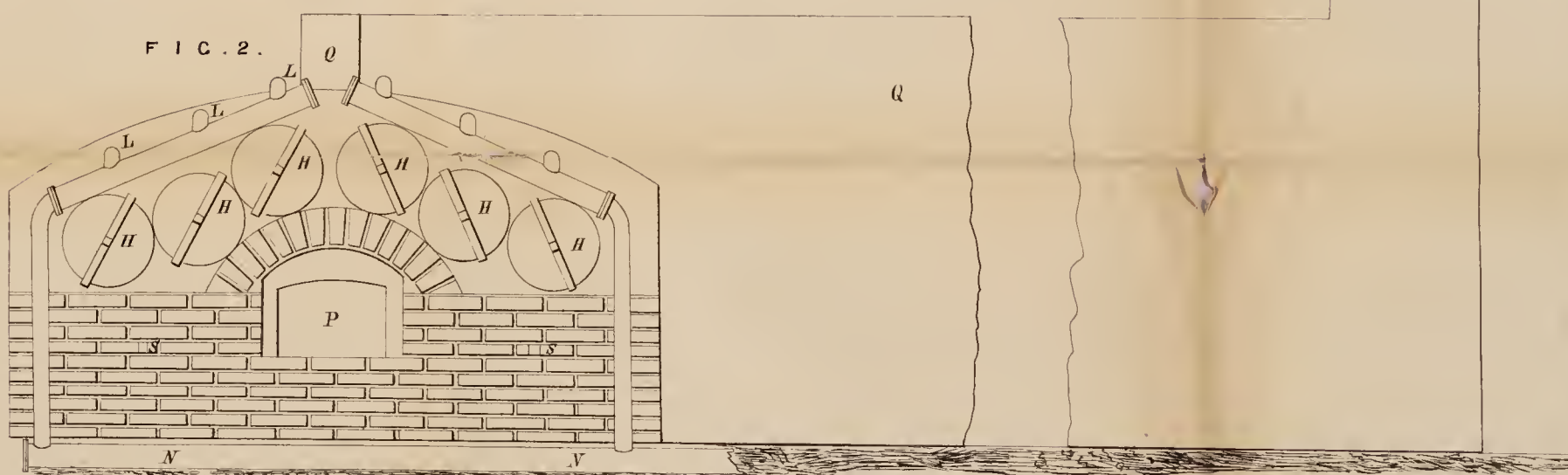
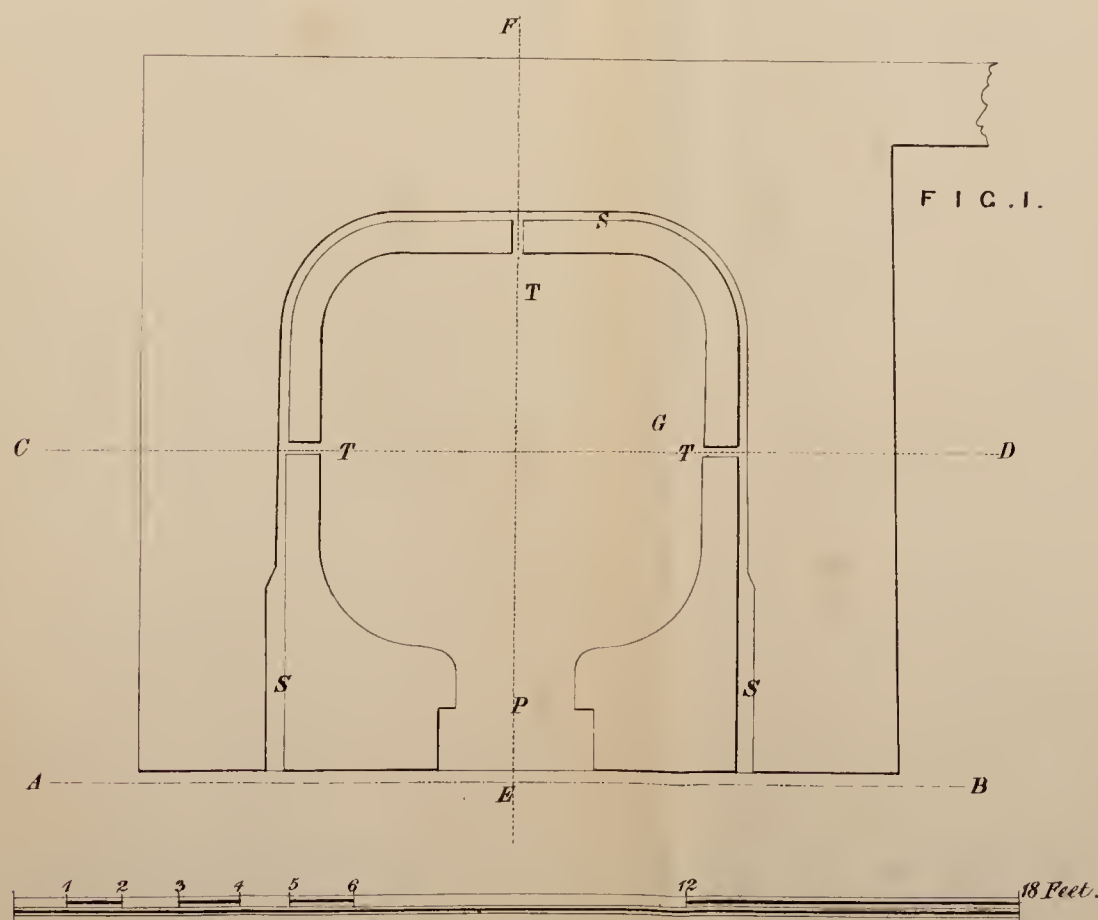


FIG. 1.

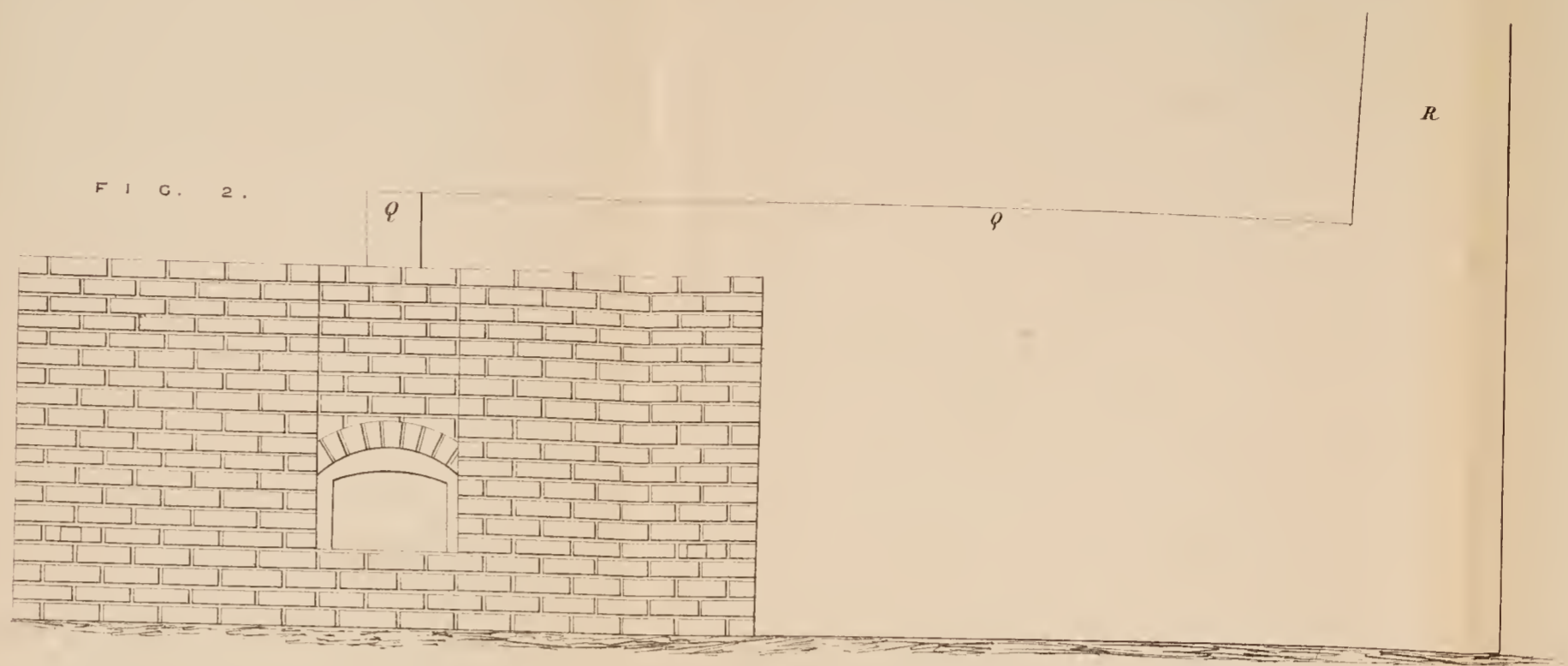


The enrolled drawing is colored.

Drawn on Stone by Malby & Sons.







Section at C.D.

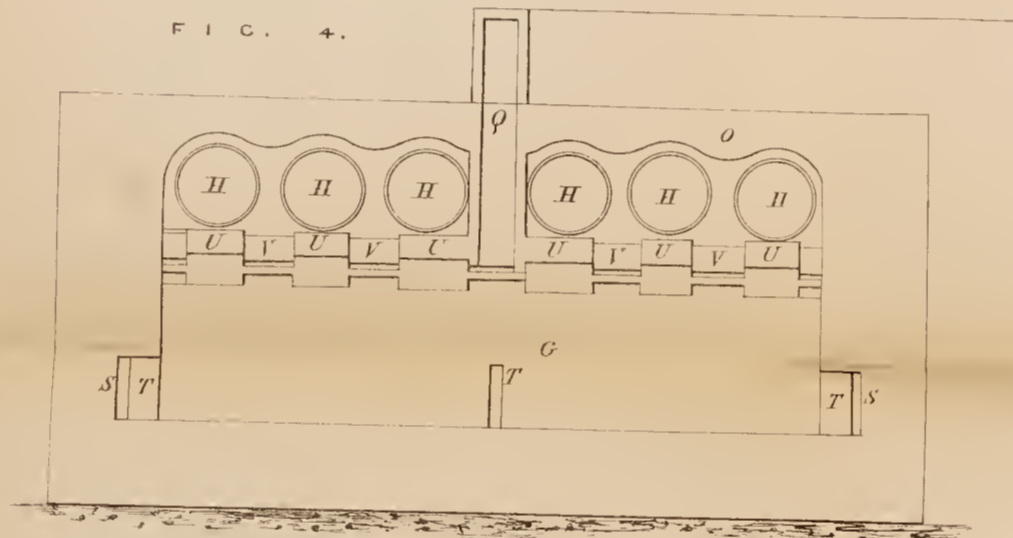


FIG. 1.

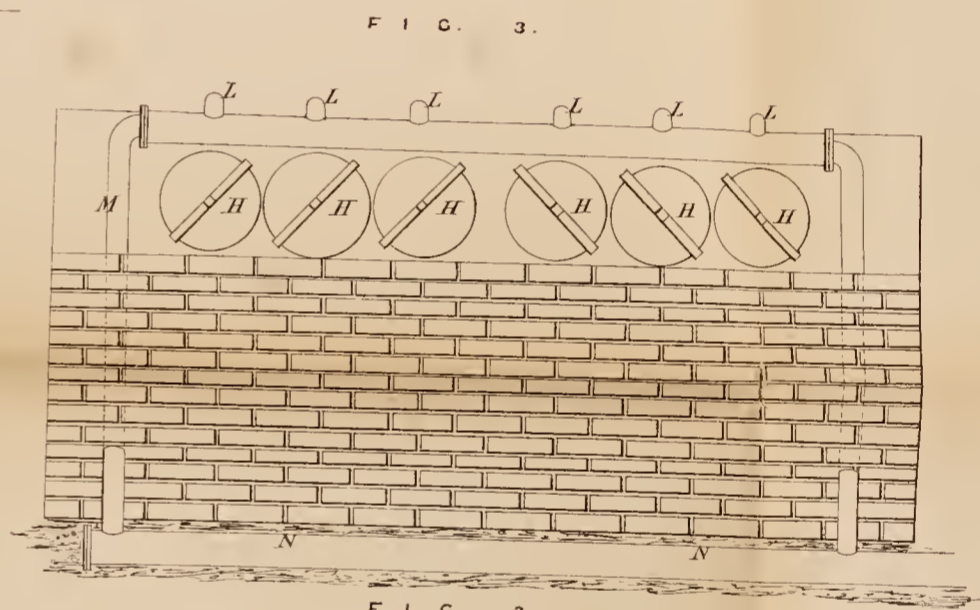
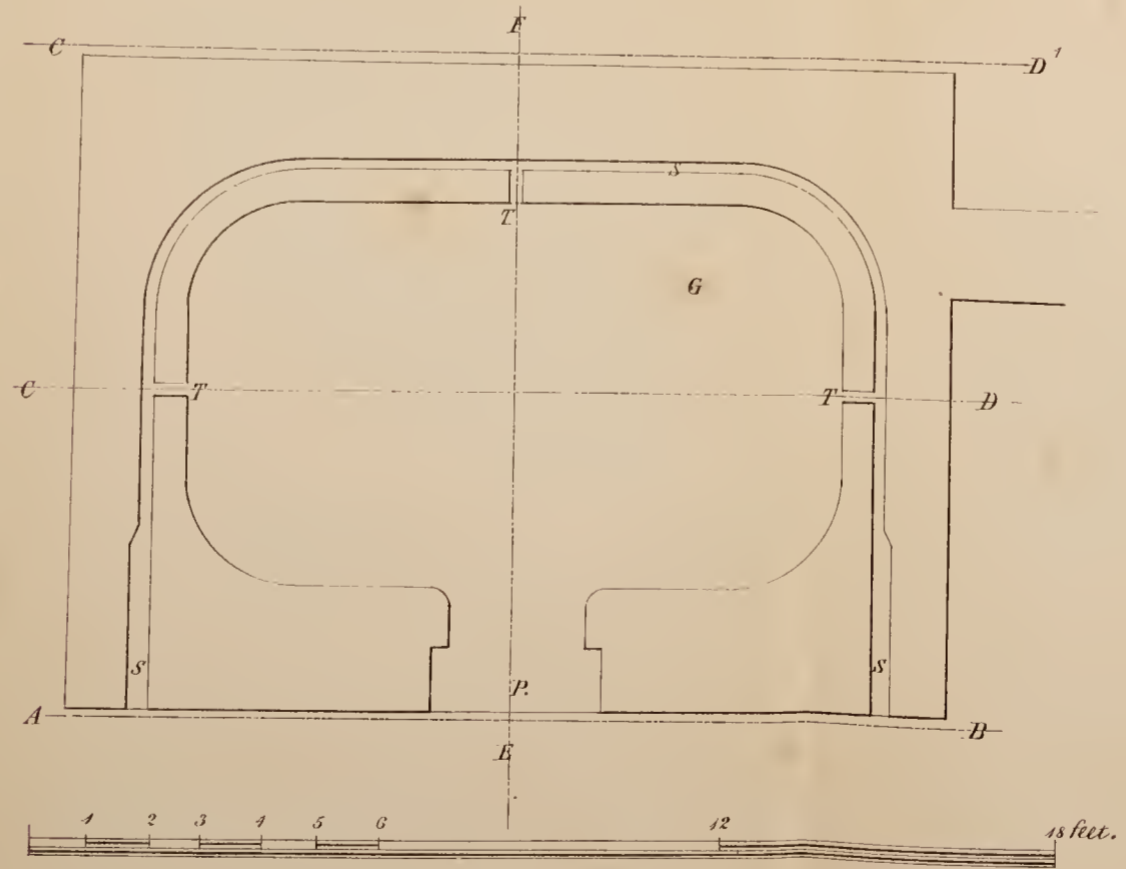
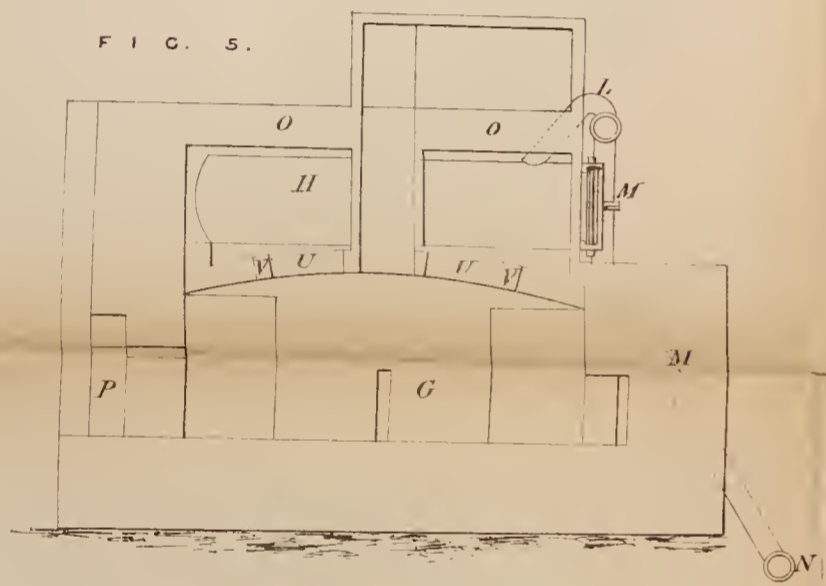


FIG. 3.

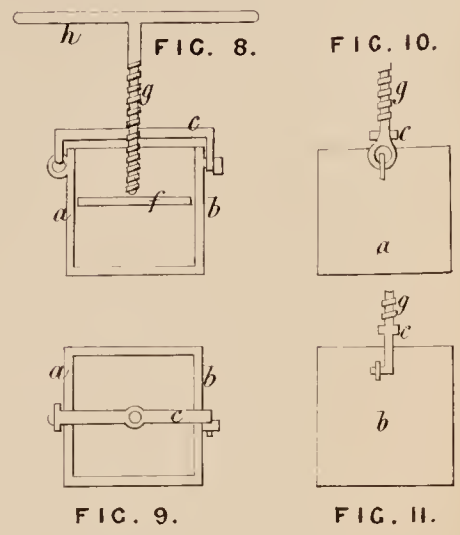


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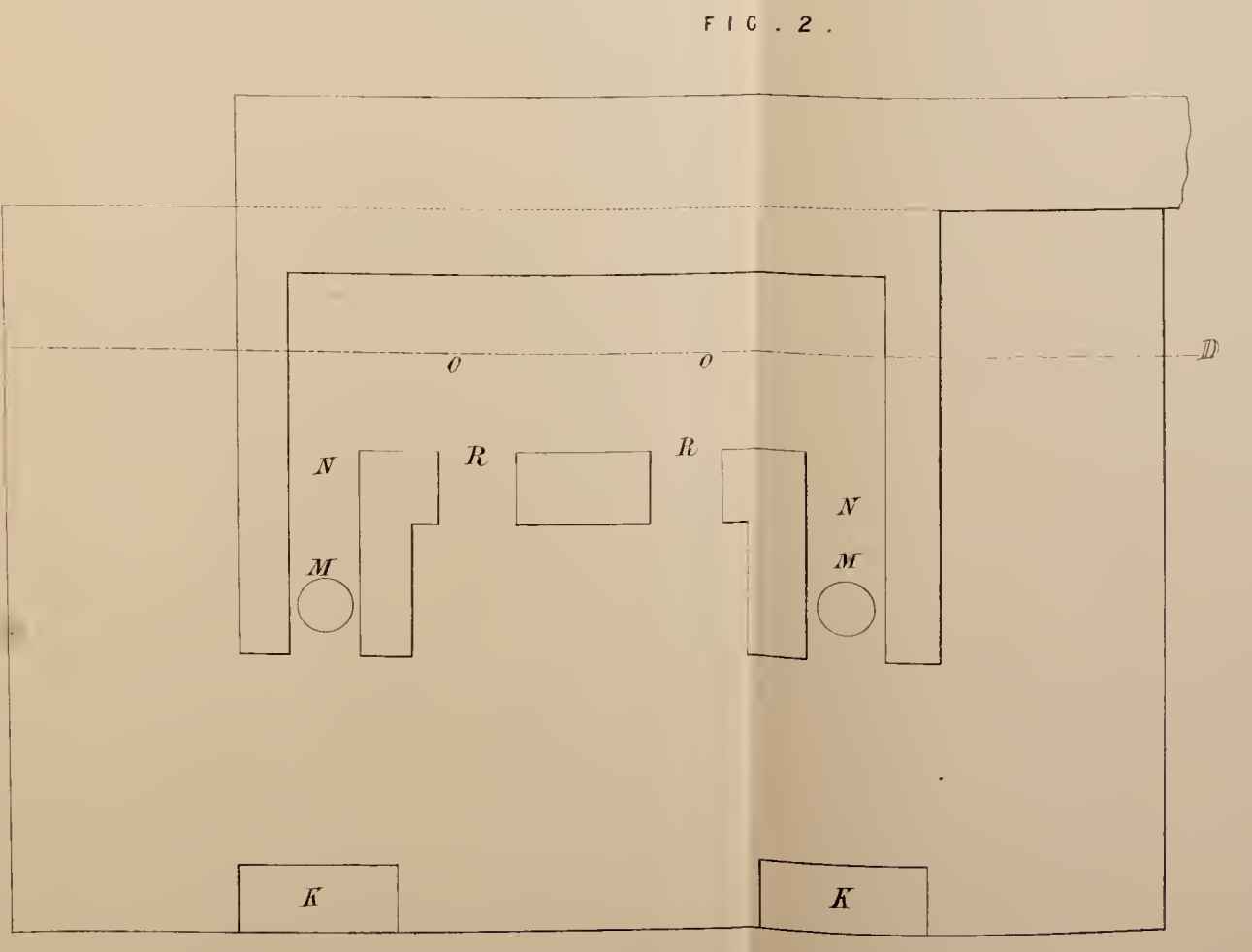
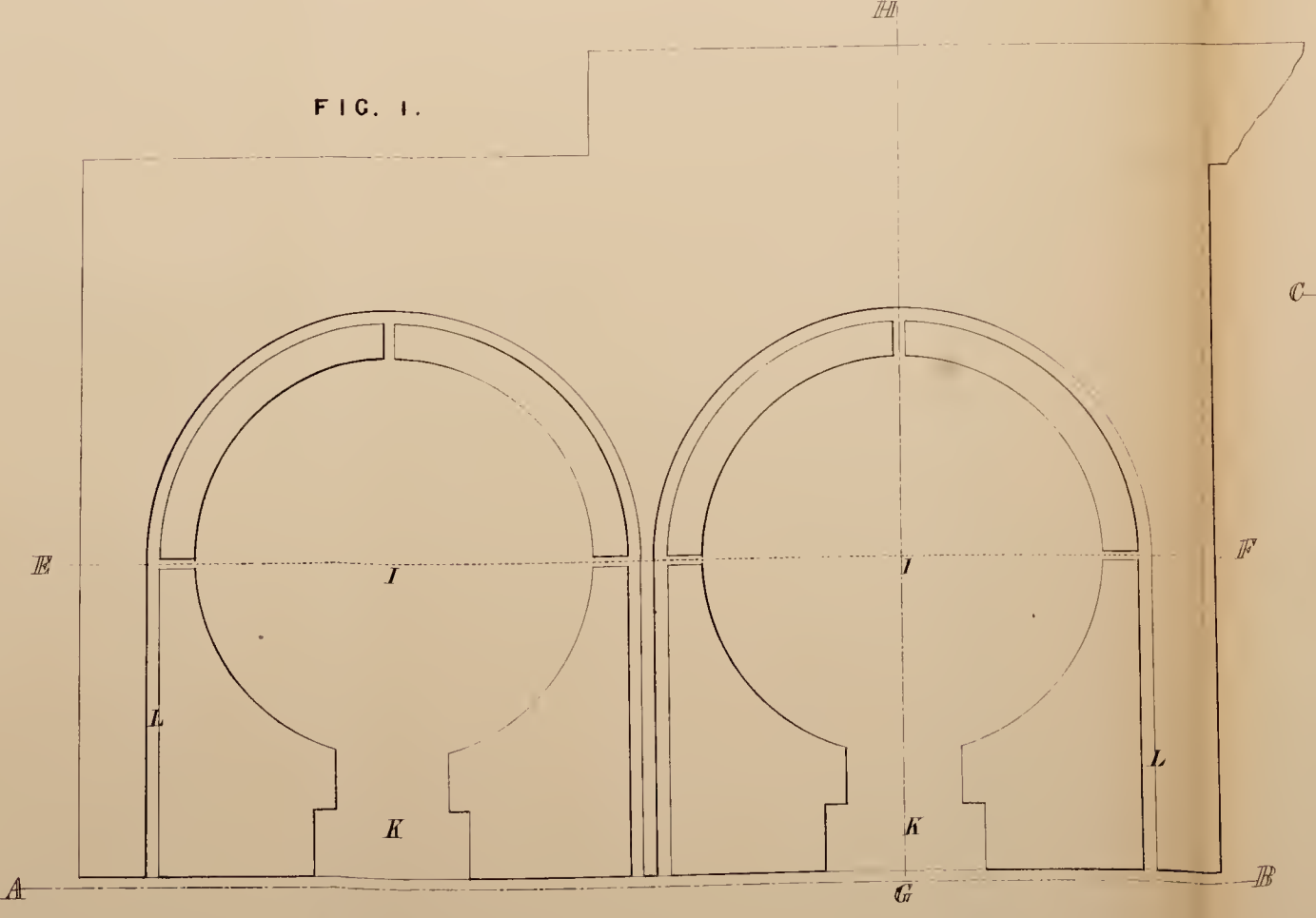
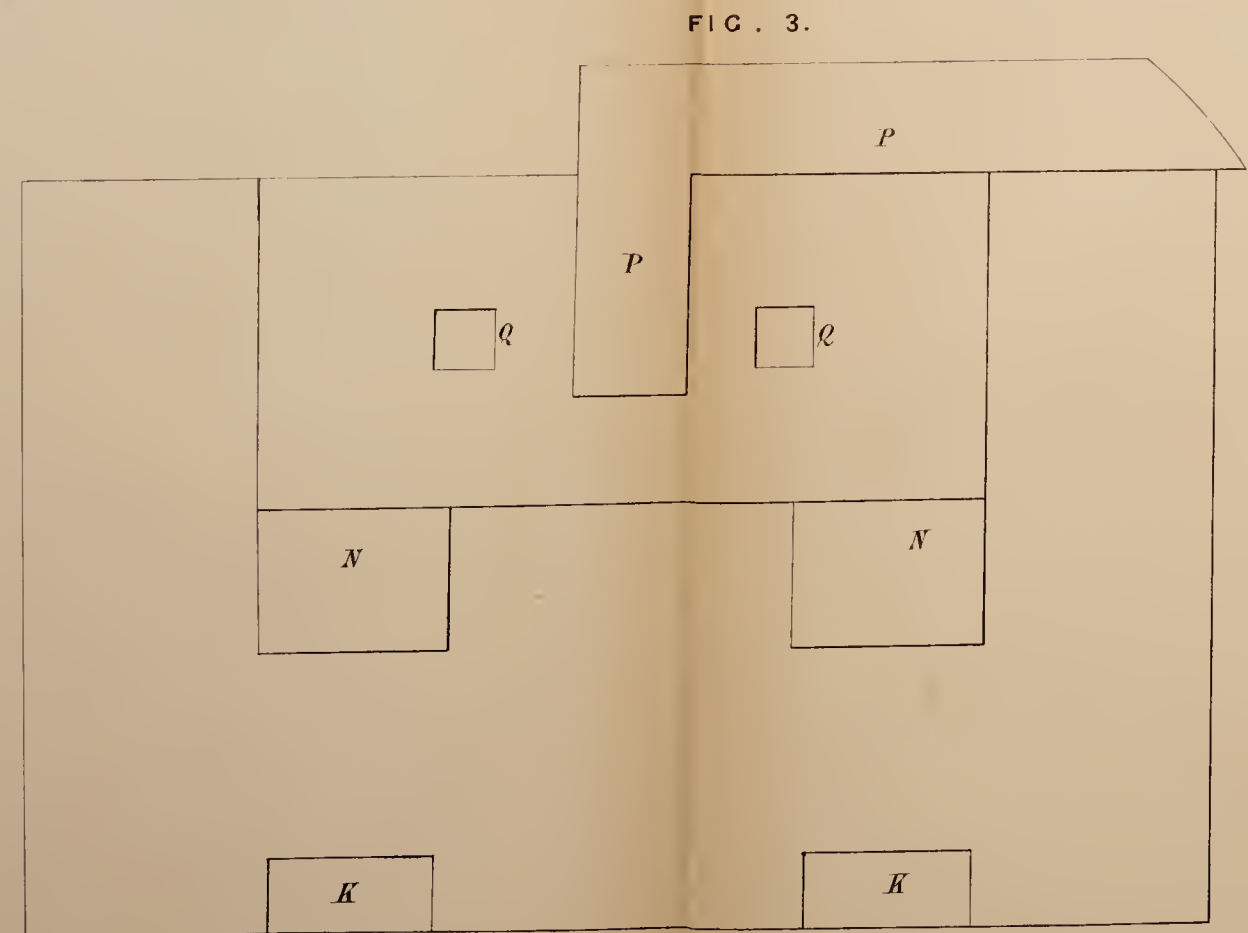
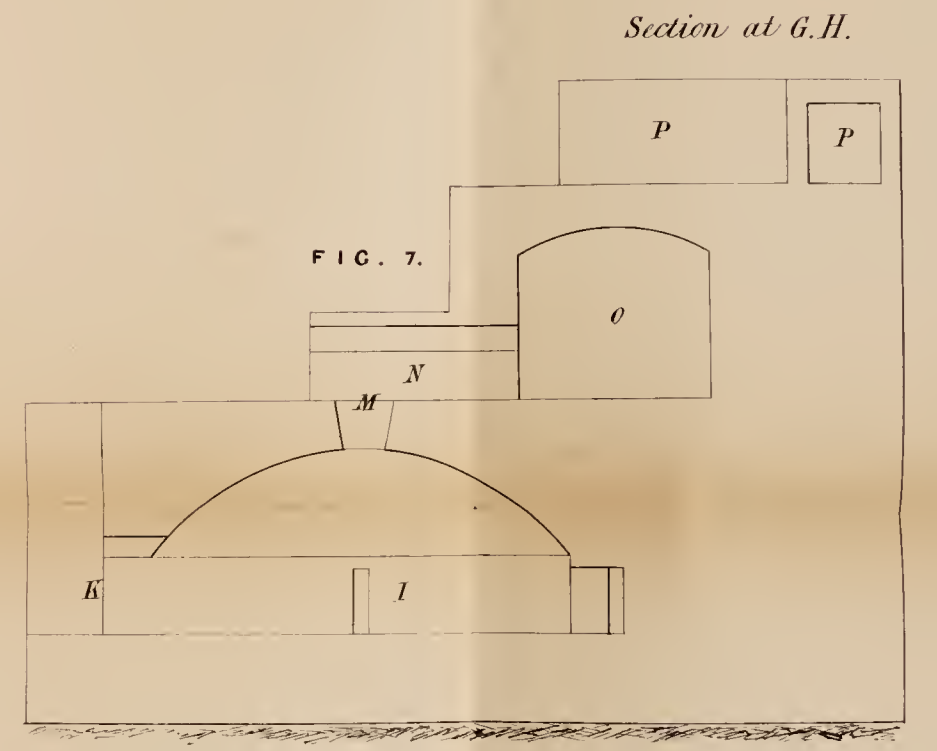
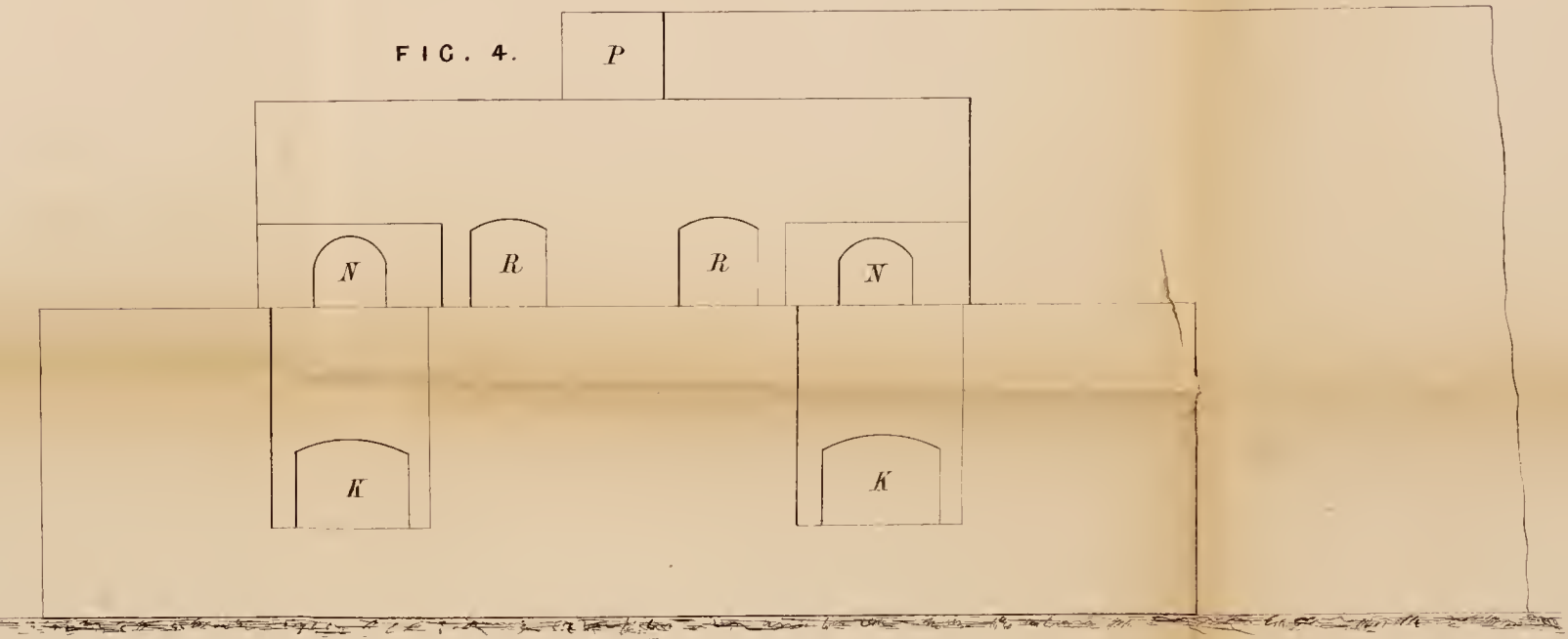
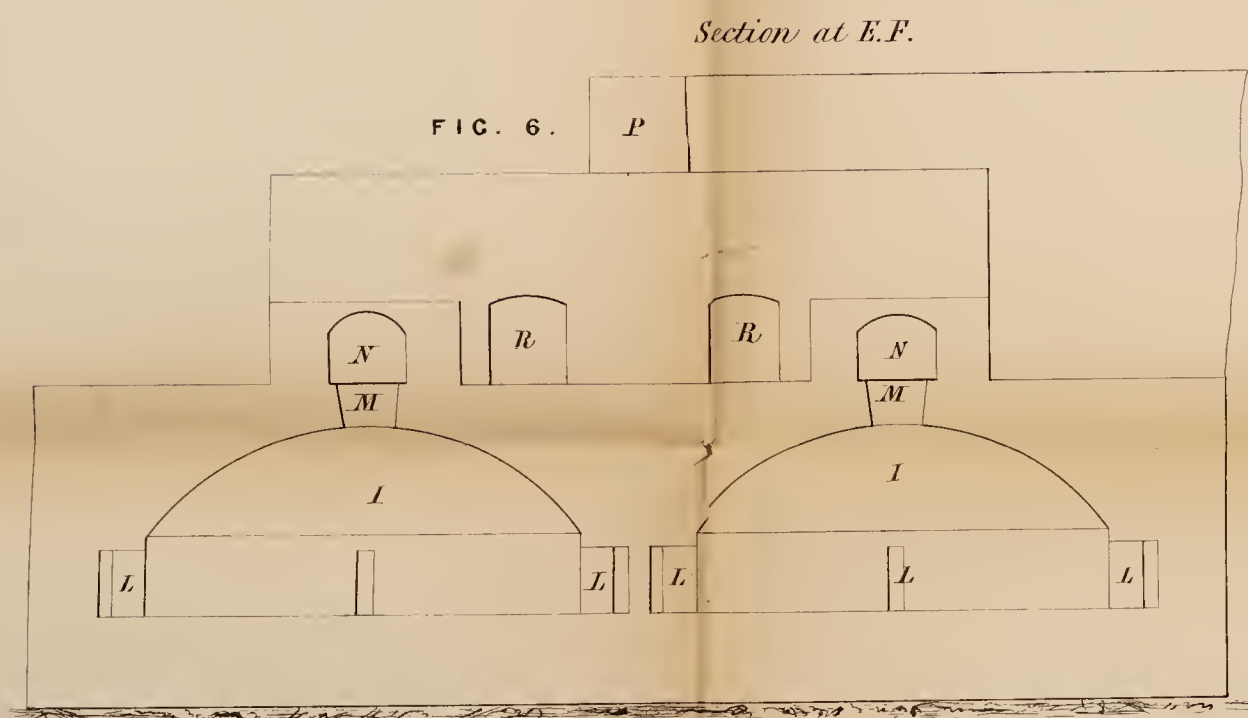
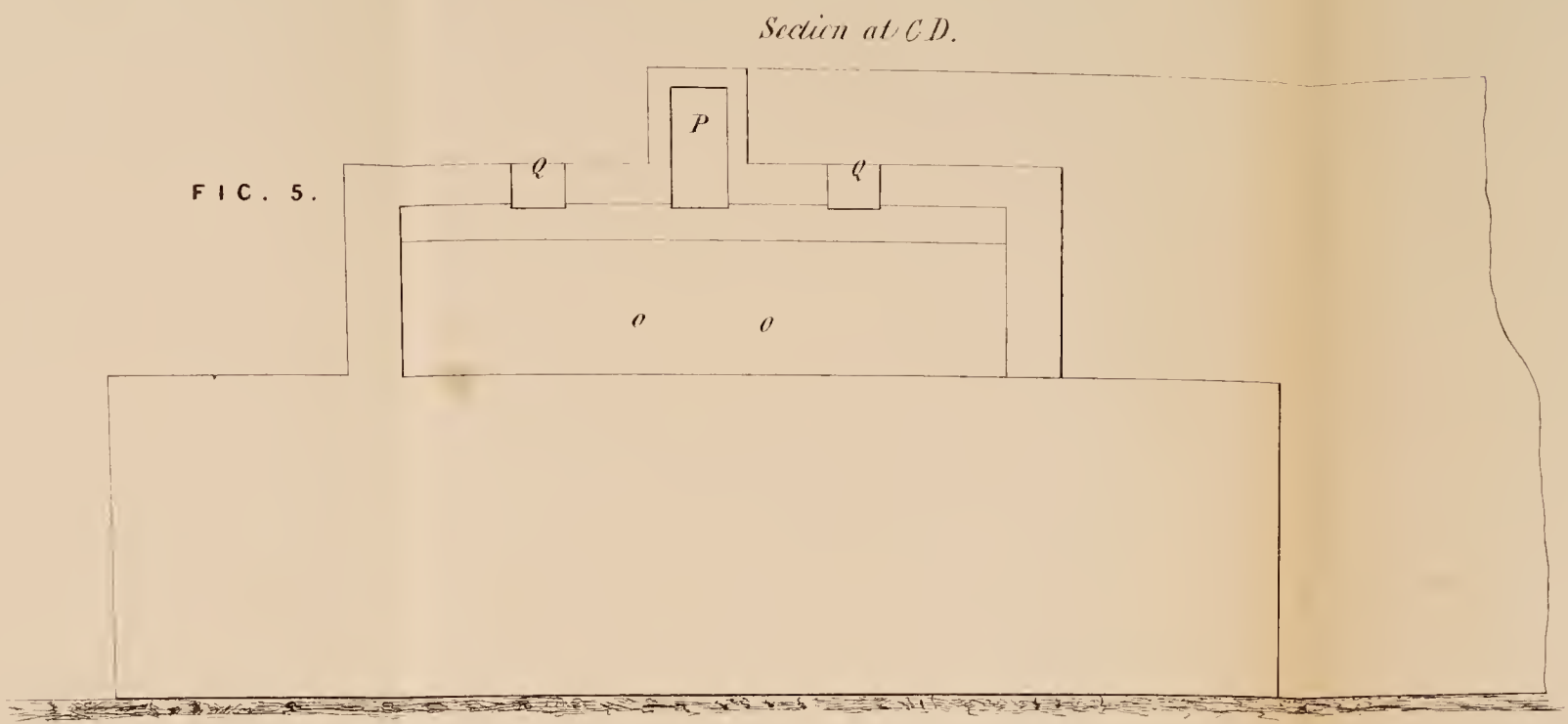


The enrolled drawing is colored





10 Inches.



10 80 120 160 Inches.

The enrolled drawing is colored.

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