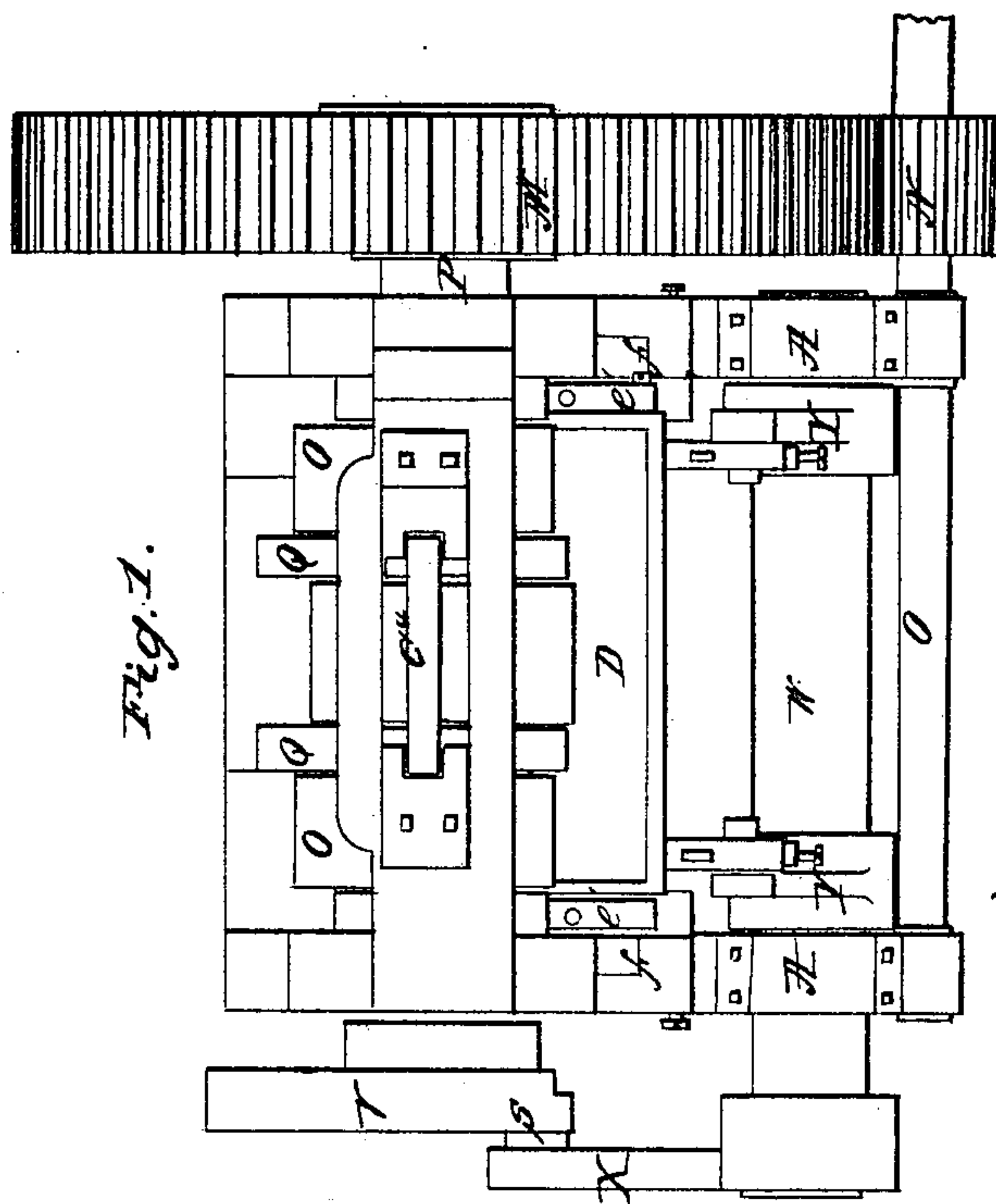
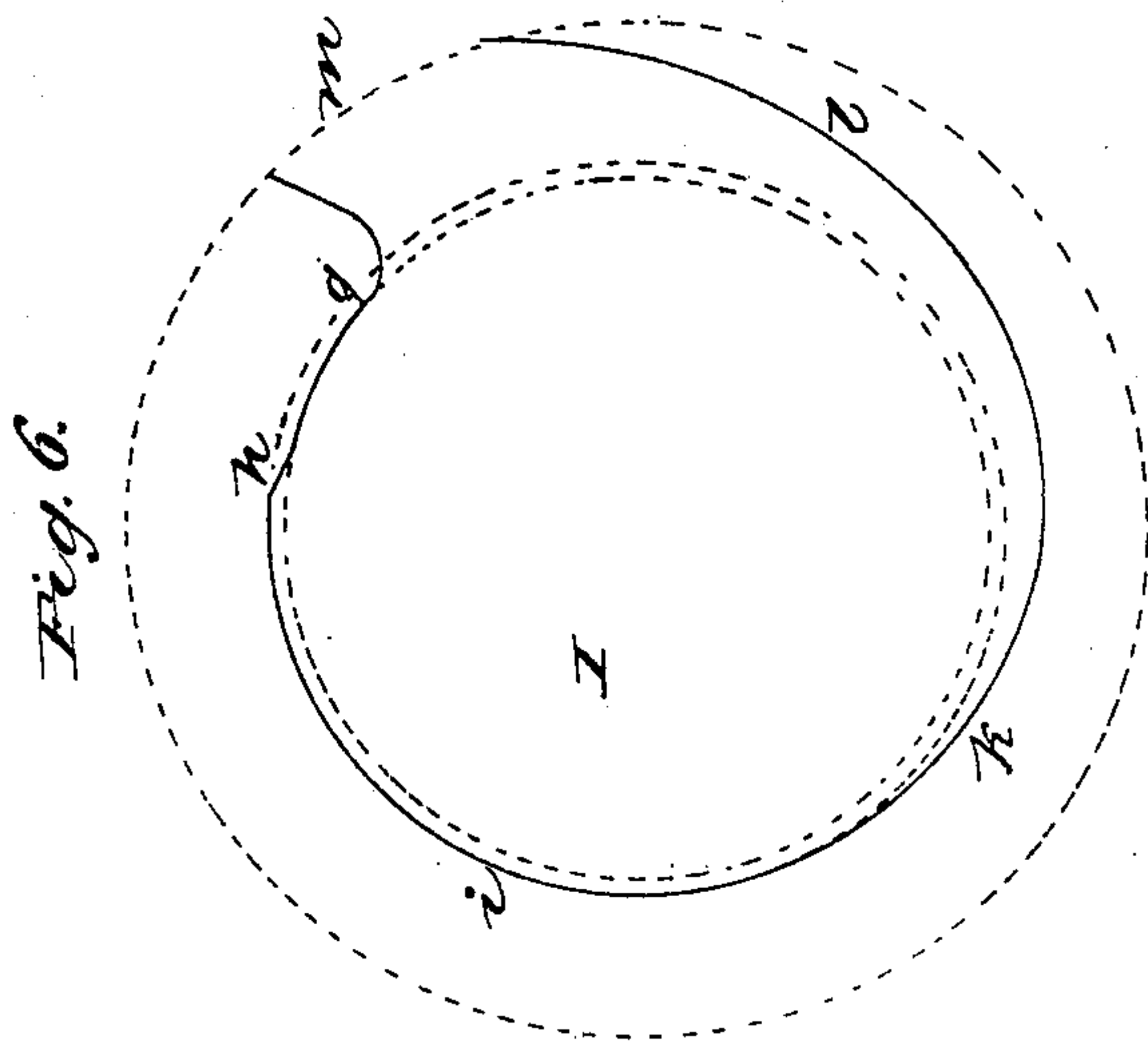


A. WOODWORTH, 3d & S. MOWER.
BRICK MACHINE.

No. 9,238.

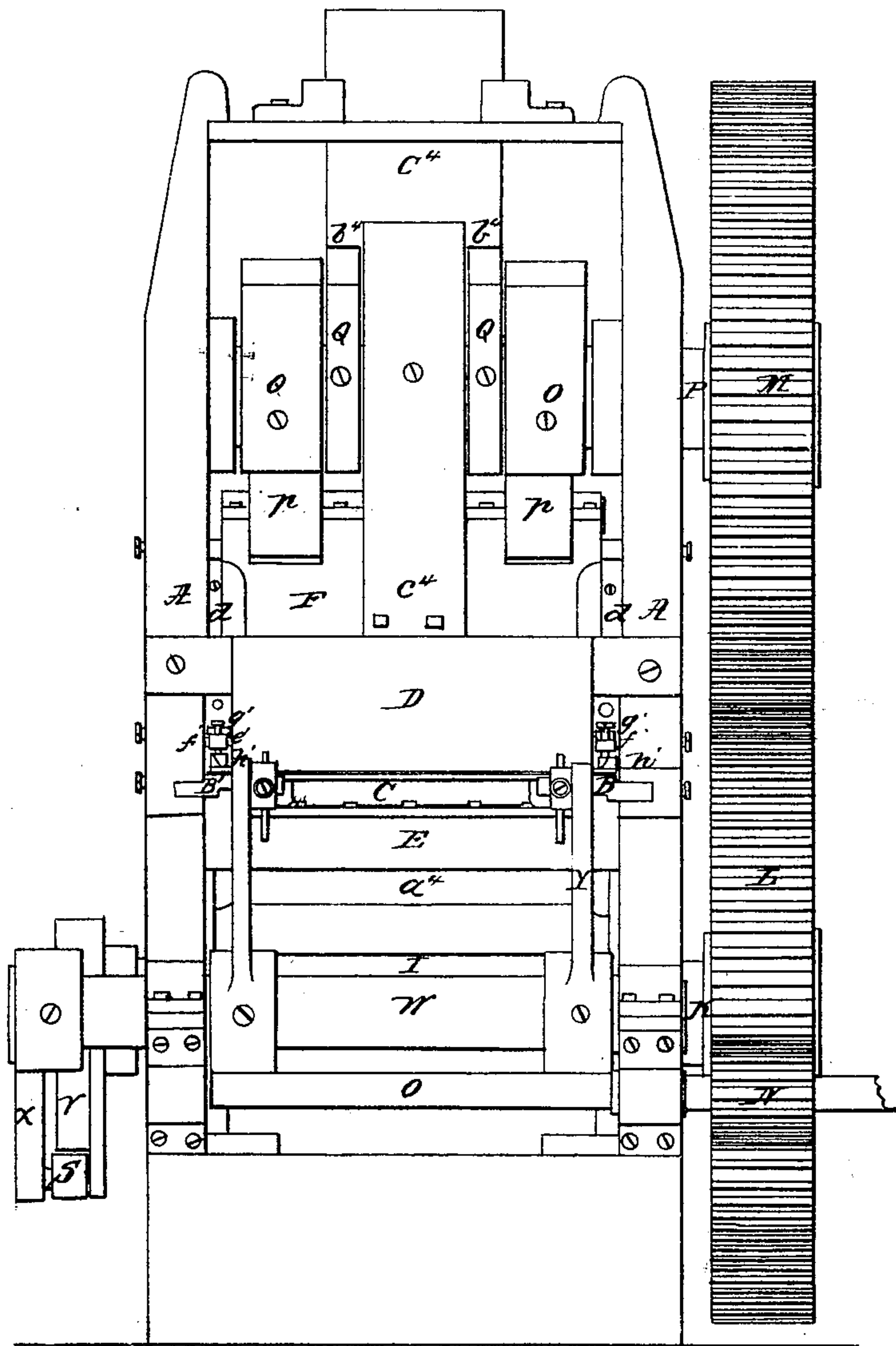
Patented Aug. 31, 1852.



A. WOODWORTH, 3d & S. MOWER.
BRICK MACHINE.

No. 9,238.

Patented Aug. 31, 1852.

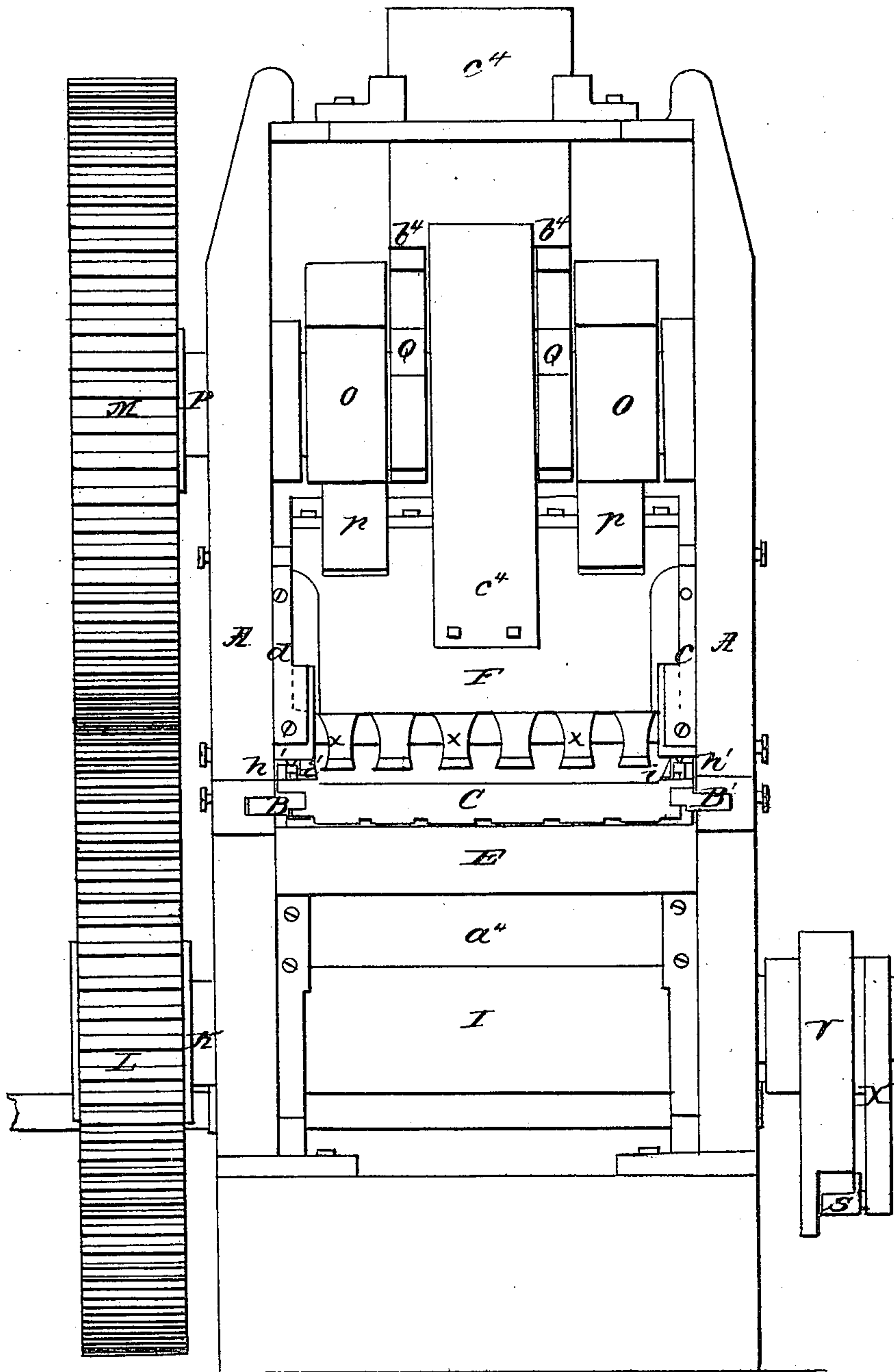


A. WOODWORTH, 3d & S. MOWER.
BRICK MACHINE.

No. 9,238.

Patented Aug. 31, 1852.

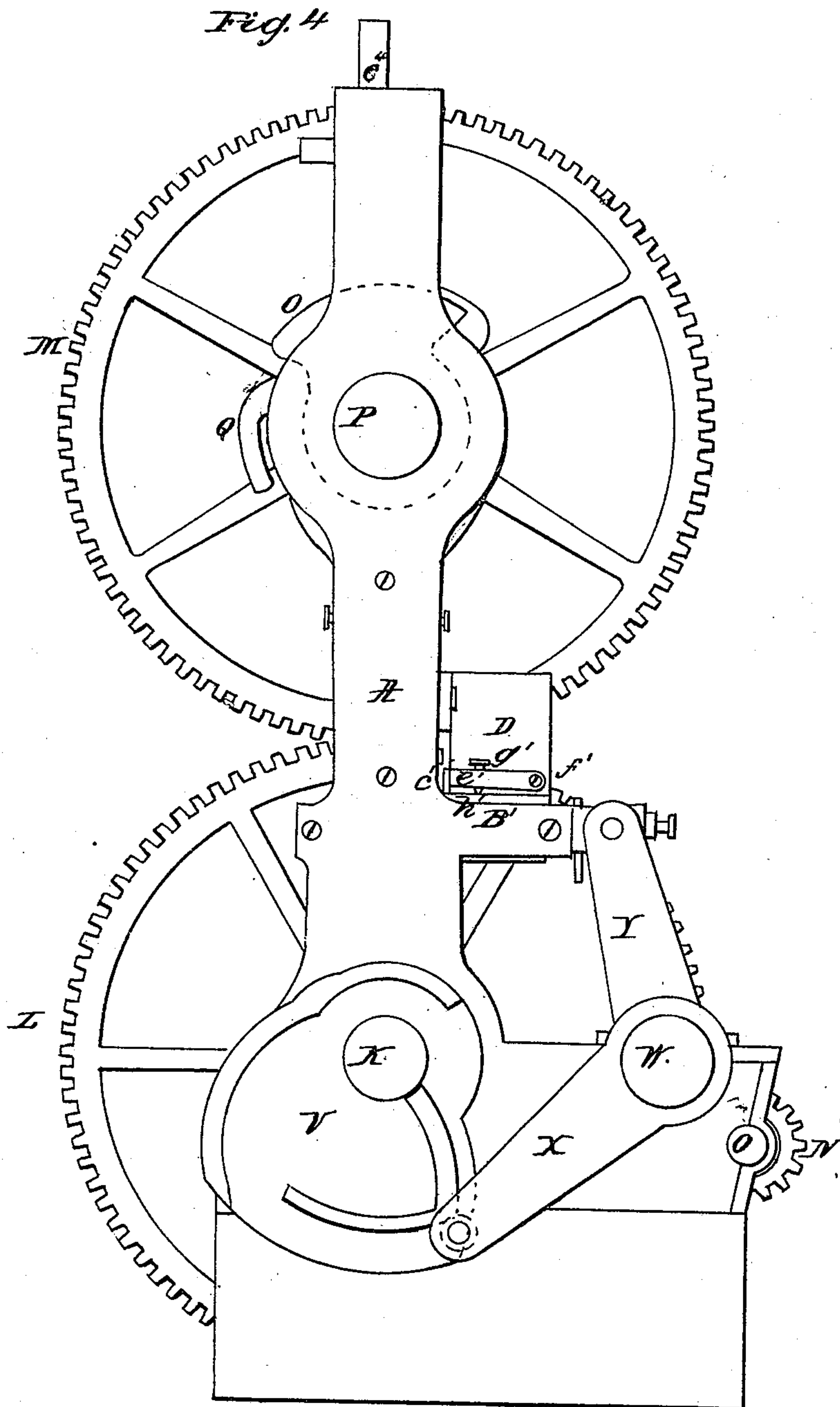
Fig. 3



A. WOODWORTH, 3d & S. MOWER.
BRICK MACHINE.

No. 9,238.

Patented Aug. 31, 1852.



A. WOODWORTH, 3d & S. MOWER.
BRICK MACHINE.

No. 9,238.

Patented Aug. 31, 1852.

Fig. 9.

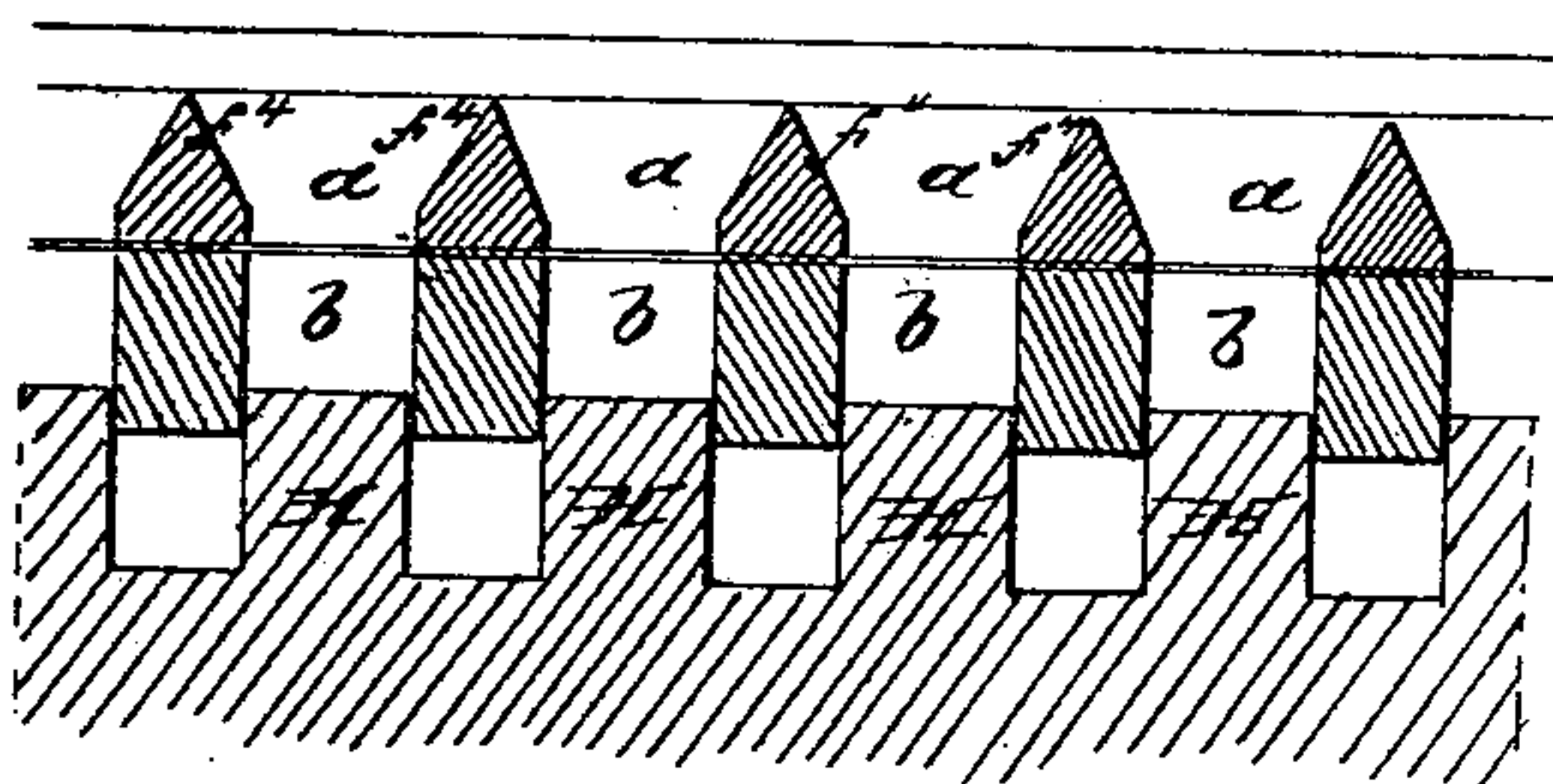


Fig. 8.

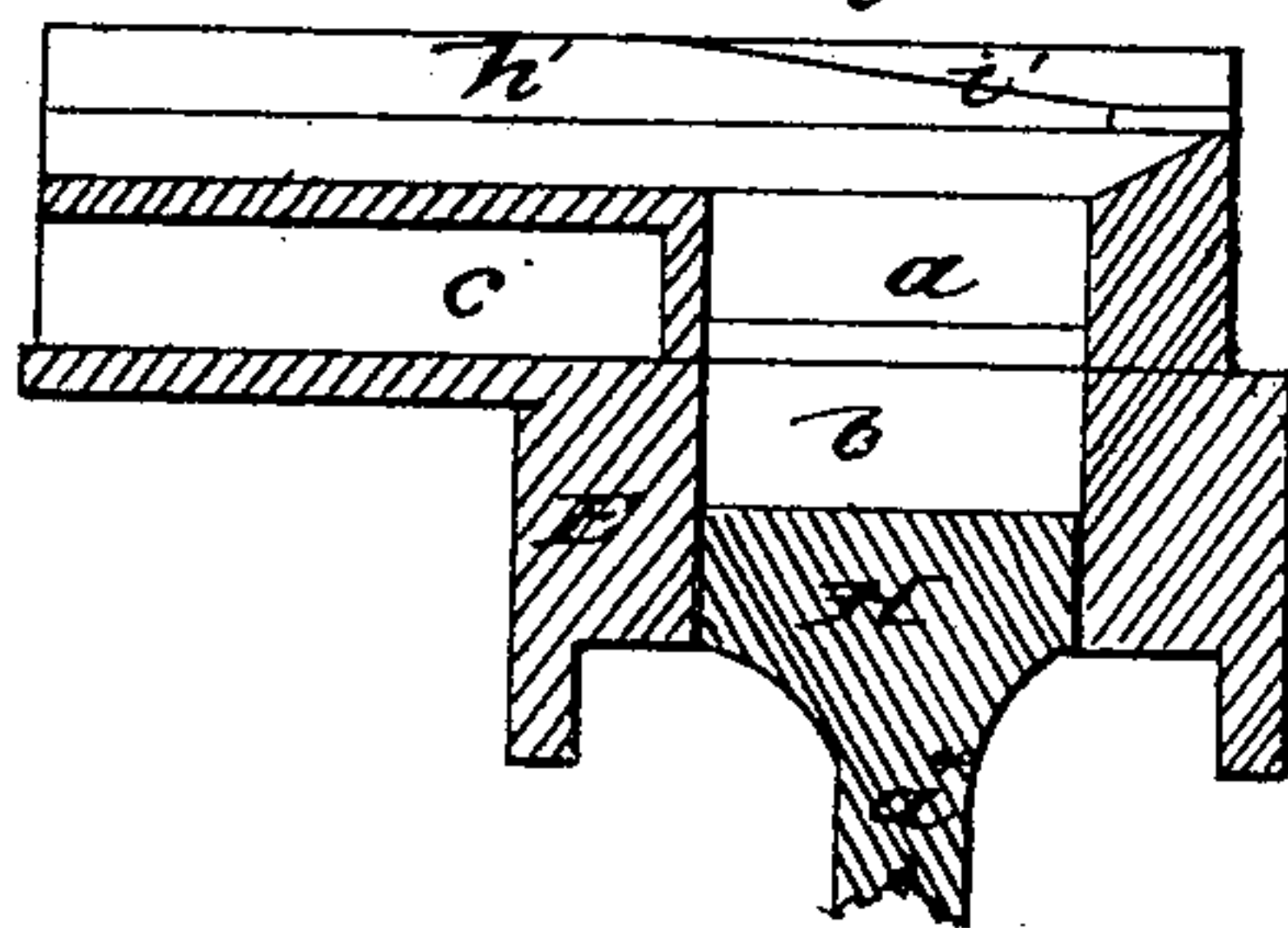


Fig. 7.

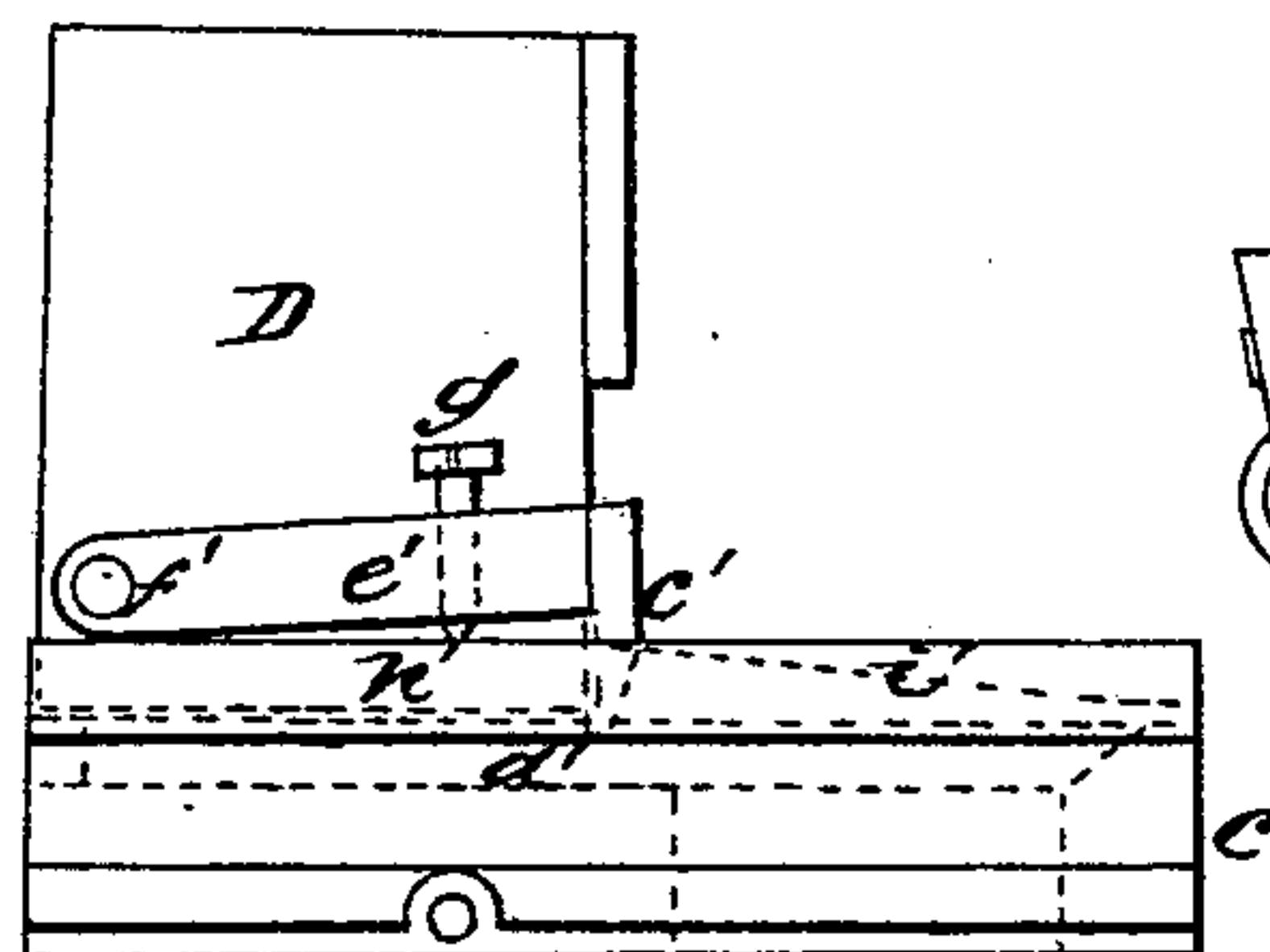
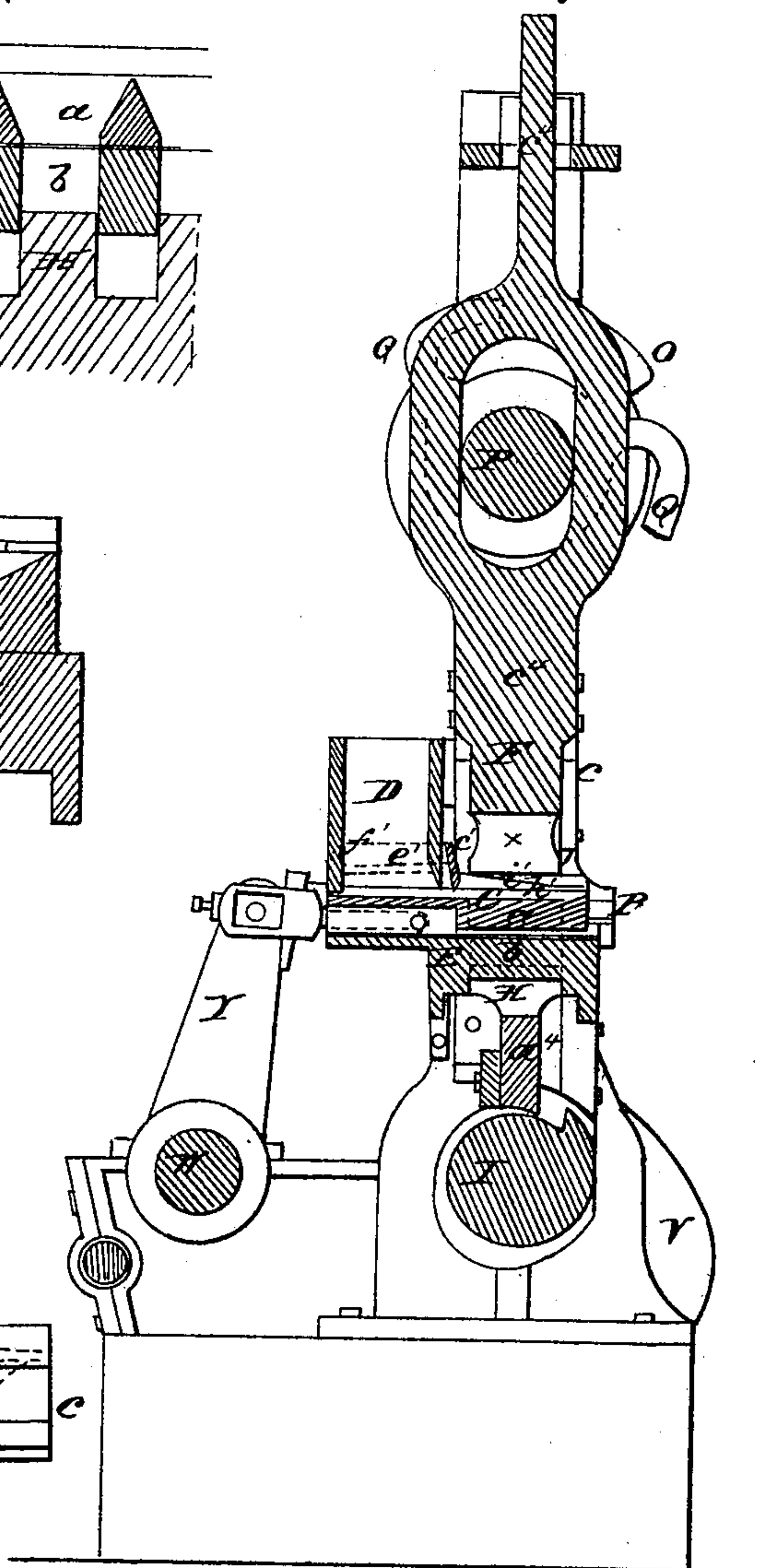


Fig. 5.



UNITED STATES PATENT OFFICE.

ARAD WOODWORTH, 3d, AND SAM'L MOWER, OF BOSTON, MASSACHUSETTS.

BRICK-MACHINE.

Specification of Letters Patent No. 9,238, dated August 31, 1852.

To all whom it may concern:

Be it known that we, ARAD WOODWORTH, 3d, and SAMUEL MOWER, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Machinery for Manufacturing Bricks, Tiles, or other Articles of Similar Character; and we do hereby declare that the same are fully described and represented in the following specification and the accompanying drawings, letters, figures and references thereof.

Of the said drawings Figure 1 denotes a top view of our machine. Fig. 2 is an elevation of one side of it. Fig. 3 is an elevation of the opposite side of it. Fig. 4 is an end elevation of it. Fig. 5 is a central, vertical, and longitudinal section of it. Fig. 6 is a transverse section, on an enlarged scale, of the cam that produces upward compression on the brick and the expulsion of it from the mold. Figs. 7, 8, and 9 are views to be hereinafter explained.

The machine we have represented in the drawings operates in many respects essentially like that described in the specification of a patent granted to us on the twenty seventh day of November, A. D. 1849, the improvements which constitute the subject of this present specification being such as experience in the construction and operation of such machines has enabled us to make in order to either remedy certain defects in the former machine or to add to it mechanism such as would impart to it new advantages.

The nature of our present improvements may be said to consist, first, in combining with the percussion machinery the lower piston or pistons, and machinery to produce a compression of the bottom surface of the brick, machinery to produce a compression of the top surface of the brick, and whether in order to finish the brick the said top and bottom surface compressing machinery be made to act simultaneously or at different times after a percussion of the ram. From the above it will be seen that to what constituted a part of our invention as before patented we have added another element or improvement, viz: that for compressing the brick on its top surface, not meaning such compression of the same as

is produced by the percussion of the ram but a separate compression effected by other means. Second, in constructing the orifices of the mold charger with flaring or inclined sides inclining inward toward each other as they descend instead of making them vertical; third, in the combination of an adjustable gate or striker with the hopper and mold charger, the same being for the purpose of striking off to any desired height or level the top surface of the clay deposited in the mold charger; fourth, in combining with the movable or adjustable gate a mechanism that will cause it to rise up as the mold charger moves forward, each rising upward of the striker being for the purpose of leaving the top surface of the clay in the charger higher at the back than it is at the front of each orifice thereof, in order to obviate the difficulty of more clay being condensed in the front part of the charger than in its rear part by the back movement of the charger.

Before proceeding to describe our present improvements we will specify the principal parts of the machine to which they are applicable.

The framework by which the operative parts of the machine are supported is represented at A in the several figures. Connected with this framework are two horizontal rails or ways B, B', arranged as seen in Figs. 2, 3, and 5, and made to support a horizontal sliding carriage or mold charger C, which carriage consists of a thick plate or frame of metal having one or more apertures *a, a*, made down through it each of which is to be of sufficient size for the reception of the quantity of clay necessary to form a brick in the mold or matrix belonging to it. In Fig. 8, a transverse vertical section of the mold charger and the mold, is shown, while in Fig. 9 a longitudinal and vertical section of the same is exhibited. The movements given to the mold charger are such as to carry the charging aperture or apertures *a, a*, of it directly beneath the lower part of or into a hopper D, (in order that the said charger may be filled with clay previously prepared and introduced into the said hopper) and next out from underneath the same and directly over one or

more other rectangular or other proper shaped orifices *b* formed through a stationary metallic bed plate or frame *E* (which may be termed the mold frame,) each of the orifices *b* being a matrix for the formation of a brick. The arrangement of the mold frame *E* is represented in the drawings.

Directly above the stationary part *E* are suitable vertical and parallel ways or guides *c, d*, between which a heavy ram weight or hammer *F* is placed and on which it slides and is guided in its vertical movements. On the lower part or end of this ram one or more rectangular or other proper shaped pistons *x, x*, is fixed, each of which is made to fit into and enter the two orifices *a, b*, (situated directly under it) when the ram is dropped or falls. To each orifice *b* there is another piston *H* which passes up into it from below and is suitably supported and guided, so that it may have vertical movements. The several pistons *H*, connected together by a bar *a⁴* rest or the bar rests on a long cam *I* arranged beneath the same and fixed on a horizontal shaft *K*, such cam in conjunction with the gravitating power of the pistons being for the purpose of operating the pistons. The weight of the several pistons and their connecting bar *a⁴* is employed to depress them, but if necessary one or more springs or other suitable equivalents may be applied to effect such purpose. The rotation of the shaft *K* is produced by a train of gears *L, N*, the former of which is fixed on the shaft while the latter is attached to the main driving shaft *O*, disposed as seen in the drawings. The cogged wheel *M* is fixed on a horizontal shaft *P* arranged as seen in the drawings, which shaft *P* carries or has fixed on it the cams *Q, Q*, that elevate the ram, the shape of one of such cams being given in Fig. 5, the other cam being similar to it. They act against the under sides of projections or shoulders *b⁴, b⁴*, from a lifter bar *c⁴* attached to the ram and extending around and above the shaft *P* as seen in Figs. 2, 3, and 5. These cams should be so constructed as to produce two elevations and allow two percussions or falls of the ram to the formation of each brick or series of bricks made at one time. During the downward stroke or first percussion of the ram the piston or pistons affixed to it are driven into the aperture or apertures *a, a*, of the mold charger and so as to compress by concussion and momentum the clay which may be within the apertures *a, b*, (or the latter) and resting on the top surface or surfaces of the lower piston or pistons *H*. When the blow of the ram is taking effect the said lower piston or pistons should be kept perfectly stationary. For this purpose a part *g* of the cam *I* (see Fig. 6) is made with a cylindrical surface. Immediately after the ram has fallen to

give the first percussion the lower piston is elevated a little or while the part *h* of the cam is moving against the lower piston frame. This rise of the lower piston or pistons is for the purpose of raising the brick a little in the mold, the vertical sides of which are made a little flaring as they proceed upward. The raising of the brick a very little under such circumstances frees it in a measure from its adhesiveness to the sides of the mold and permits compressed air around the edges of the brick to escape, the diminution of adhesiveness tending to lessen the friction of the clay against the sides of the mold under the second percussion of the ram. Next or while the part *i*, which is also cylindrical, of the cam is moving directly under and against the lower piston or pistons the said piston or pistons are held perfectly stationary, and this while the upper pistons and ram are elevated high enough to remove the upper pistons entirely out of the molds, and the mold charger is moved back and directly underneath the hopper for the purpose of being again filled with clay, and a second percussion or fall of the ram and its pistons takes place, all of which in the meantime is produced. Next the part *k* of the cam is brought into action, so as to raise the lower pistons, while at the same time the upper pistons are forced downward by cams *o, o*, fixed on the shaft *P*, which cams respectively act against friction rollers *p, p*, placed at the top of the ram. Thus are compressed not only the bottom surface of the brick, but the top surface of it also, and we have found it necessary to so compress the top surface of it in order to produce good work, for the mere pressure of the lower pistons against the brick while its top surface is at rest is so prevented (by the adhesion of the brick to the sides of the mold) from producing the requisite density of the top surface that unless we compress the top surface by direct compression produced by a downward movement of the upper pistons we fail in getting so good or smooth a top surface as is desirable. While the part *l* of the cam is in action against the lower pistons they are raised up in the mold so as to expel the brick, the upper pistons being raised in the meantime and also entirely off the bricks, so as to allow them to be moved off the lower pistons by the mold charger, which in its advance with fresh clay crowds the bricks off while the part *m* of the cam (which part is a circular arc) is in action against the lower pistons. The machinery that operates the carriage or mold charger *C*, consists of a cam *V* fixed on the shaft *K*, a horizontal fulcrum or rocker shaft *W* and three arms *X, Y, Y*, extended from the said shaft *W*, as seen in the drawings. A projection *s* from the

arm X is made to enter and work against the cam V. The upper ends of the arms Y, Y are suitably connected to the carriage C by such joints or connections as will allow of the horizontal movements of the carriage produced by the combined operation of the cam V, and the arms X, Y, Y, when the said cam is put in rotation by the shaft to which it is affixed.

10 The mold charger has its orifices *a*, *a*, constructed with flaring or inclined sides, as seen in Fig. 9, at *f*¹ *f*¹. When made with vertical walls or sides it has been found that the clay in falling out of the
15 orifice *a*, into the matrix *b* would be denser in the middle. Consequently when compression of the clay took place, there being more clay in the middle of the pile, the said pile would be pressed denser in its
20 middle than at its sides, thus often making imperfect edges on the brick. By making the orifice *a*, flaring on its two opposite sides, and on the ends also if desirable, it has been found that the pile of clay de-
25 posited in the matrix *b*, is highest on the sides and lowest in the middle. This is presumed to arise from the fact that the central part of the clay in the charger C falls into the matrix *b* and nearly fills it
30 before the clay resting immediately above the inclined sides *f*¹ *f*¹ has a chance to fall, and as it falls last it causes the mass in the matrix to assume the concave shape on top that makes it lowest in the middle.
35 Under such circumstances the clay forming the brick when compressed becomes as dense or denser on the edges than in the middle, and thereby more perfect edges are formed than can be when the orifices *a*, *a*,
40 are made with vertical sides.

The hopper D is made with an opening *d'* through the lower part of its front side, as seen in Fig. 5, such opening being made to extend from end to end of the hopper
45 and directly above the upper surface of the mold charger C. To this opening on its front side we apply an adjustable gate or striker *c'* arranged as seen in Figs. 5 and 7, the latter being an end view (on an en-
50 larged scale) of the hopper and the supporting arms and ways of the striker. The striker is supported by two arms *e'*, *e'*, each of which turns freely up or down on a pin or fulcrum *f'* at its rear end. An adjust-
55 ing screw *g'* passes down through each arm and rests on a rail *h'* affixed to the carriage or mold charger C. The screw enables us to adjust the height or level of the lower edge of the striker, so as to cause it when
60 the mold charger is moved toward the molds to strike off to any required height or level the top surface of the clay deposited in the mold charger. This contrivance is by no means like the scraper that we sometimes
65 apply to the lower part of the front of the

mold charger to scrape off the upper edges of the mold, for in this instance the adjustable striker is applied to the hopper and acts on the top of the mold charger instead of acting on the top of the mold. When applied to the
70 hopper and mold charger its office is entirely different from that of a scraper applied to the mold charger and made to scrape over and on the mold. In the present instance it has nothing to do with the mold, but operates
75 on the mold charger and enables us to regulate the height of clay in the charger as such may be required in accordance with the nature of the clay, some clay in order to pro-
80 duce a brick of the desired thickness under the compression and percussion it receives in the machine requiring to be struck off to a little greater height than other kinds.

It has been found, during the return or back movement of the mold charger or its
85 movement from over the molds and directly under the hopper that such movement causes the clay to pack more closely in the front part of each orifice *a* of the charger than it does in the back part of it. In con-
90 sequence of this the front part of the brick when formed becomes denser than the back part, the latter in consequence thereof not being likely to be properly formed. In order to prevent this difficulty we combine
95 with the movable or adjustable gate or striker *c'* a mechanism (such being an inclined cam or inclination *i'* of each rail *h'*, as seen in Fig. 7) that will cause it to rise
100 up as the mold charger moves forward toward the molds, such rising up of the striker being for the purpose of leaving the top surface of the clay in the charger higher at the back than it is at the front of each ori-
105 fice thereof. Such rising up or elevation of the striker should be such as will leave a sufficiency of clay in the back part of each orifice of the charger to make the brick of a uniform density when pressed.

Having thus described our improvements
110 what we claim as of our invention is as follows:

1. We claim combining with the percussion machinery the lower piston or pistons and machinery to produce a compression of
115 the bottom surface of the brick, and machinery to produce a compression of the top surface of the brick, the whole being substantially as hereinbefore described, not meaning such compression of the same as
120 is produced by the percussion of the ram, but a separate compression effected by other means as described.

2. We also claim the improvement of constructing each of the orifices of the mold
125 charger with flaring or inclined sides inclining inward toward each other as they descend, the whole being substantially in manner and to effect the object or overcome the difficulty hereinbefore stated.
130

3. We also claim the improvement of combining with the adjustable gate or striker a mechanism that will cause it to rise upward as the mold charger moves forward toward the molds, such rising upward of the striker being for the purpose hereinbefore explained.

In testimony whereof we have hereto set

our signatures, this third day of April, A. D. 1852.

ARAD WOODWORTH, 3d.
SAML. MOWER.

Witnesses:

R. H. EDDY,
G. N. CUTLER.