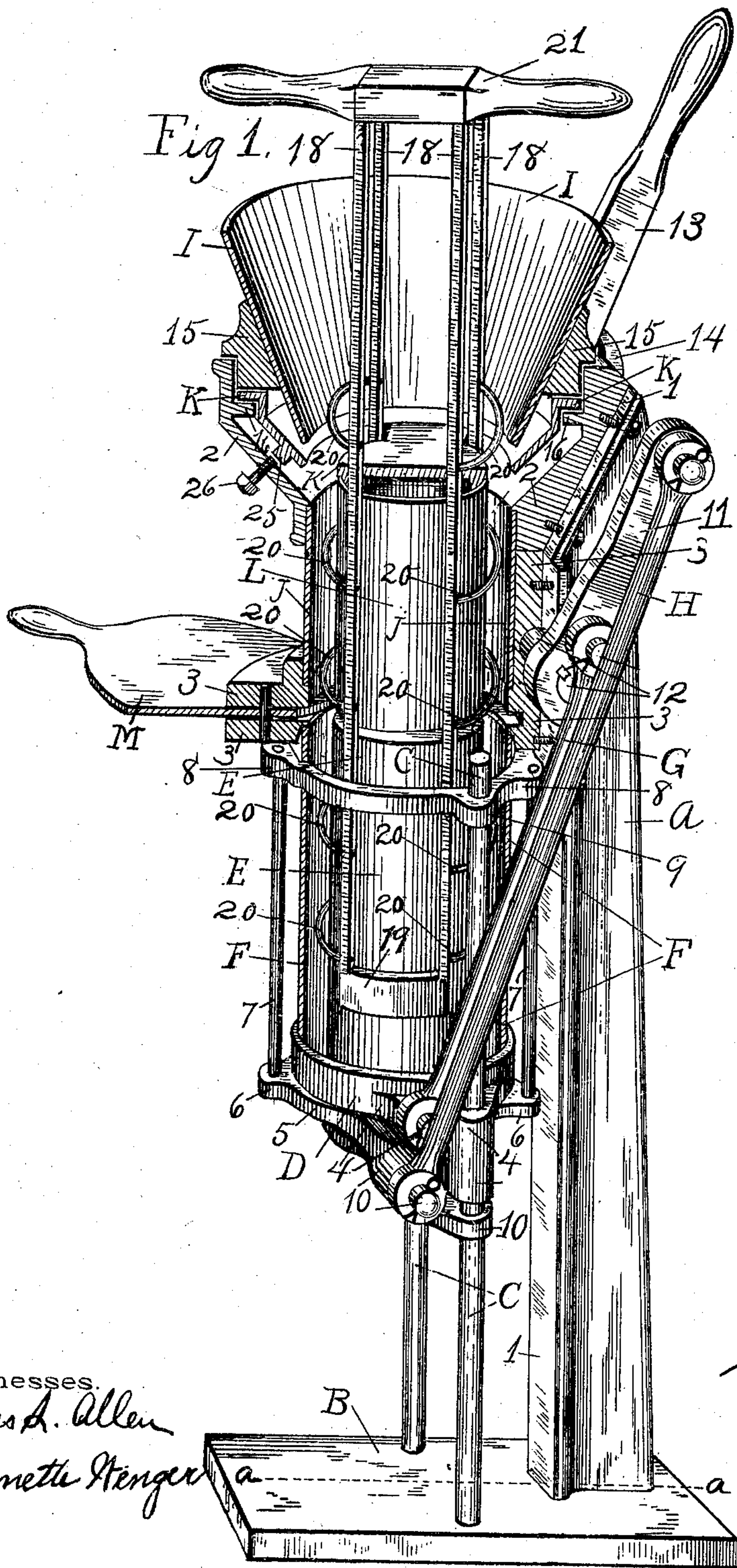


986,448.

C. G. ELMORE.
MACHINE FOR MAKING TILE AND THE LIKE.
APPLICATION FILED APR. 1, 1908.

Patented Mar. 14, 1911.

3 SHEETS—SHEET 1.



Witnesses.

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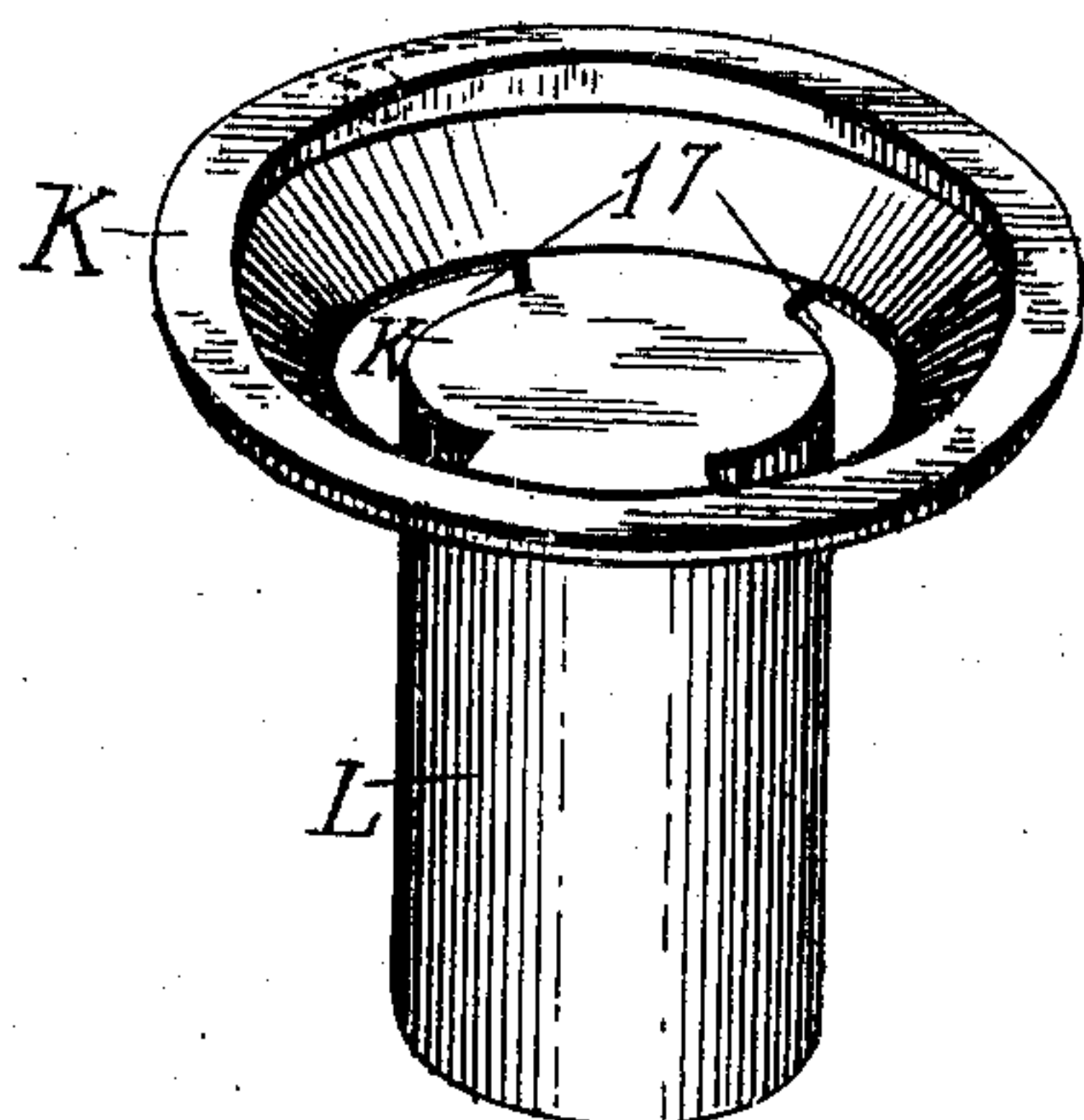


Fig. 2.

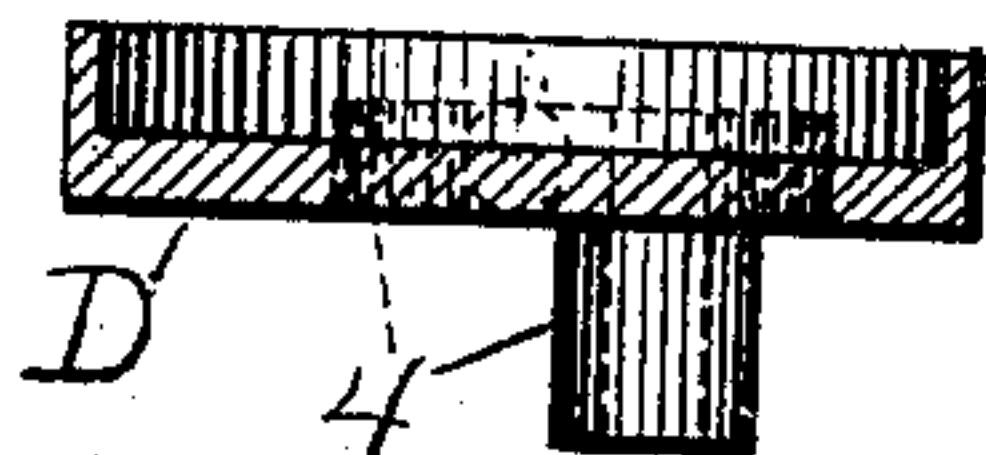


Fig. 4.

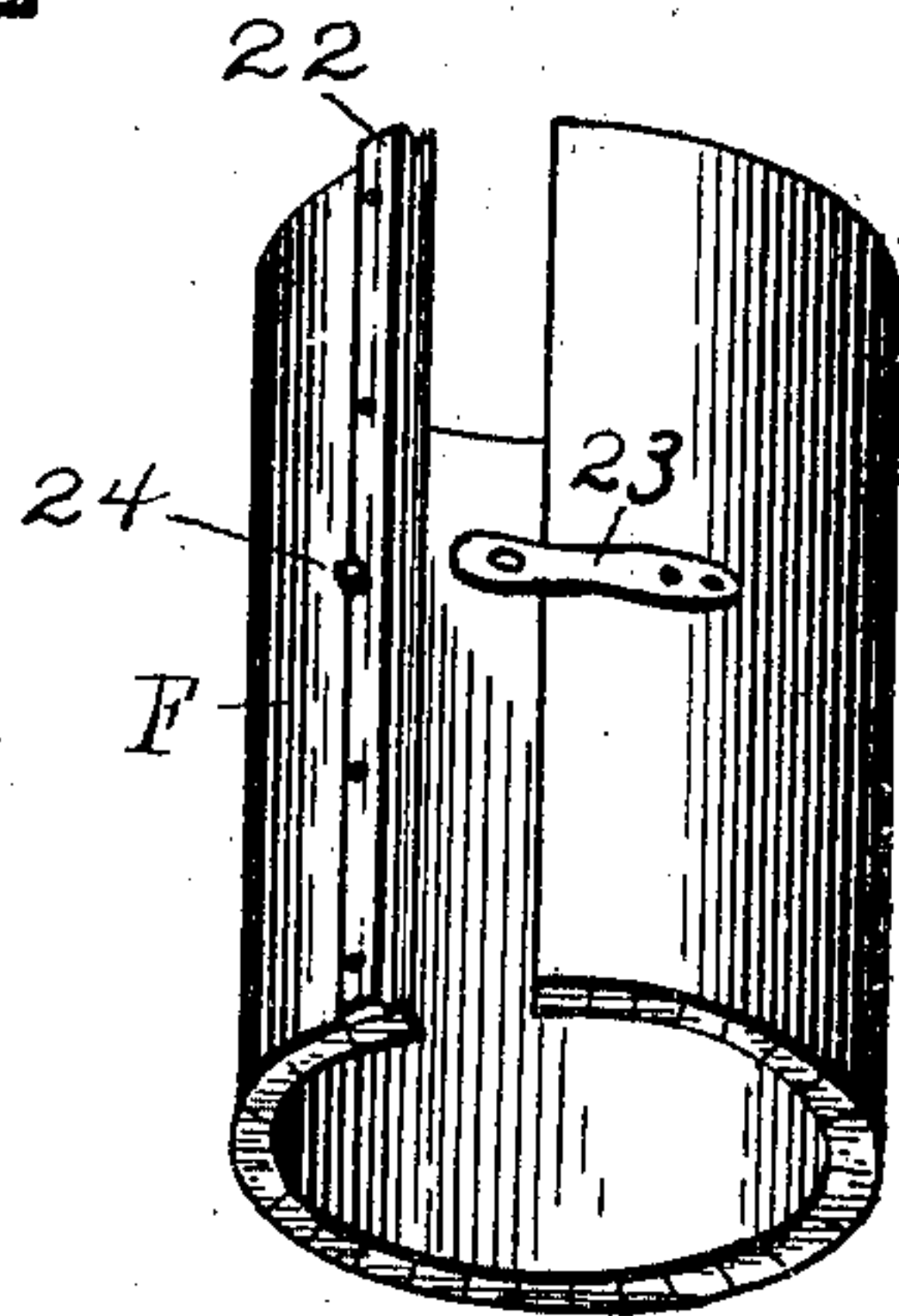


Fig. 3.

Witnesses.

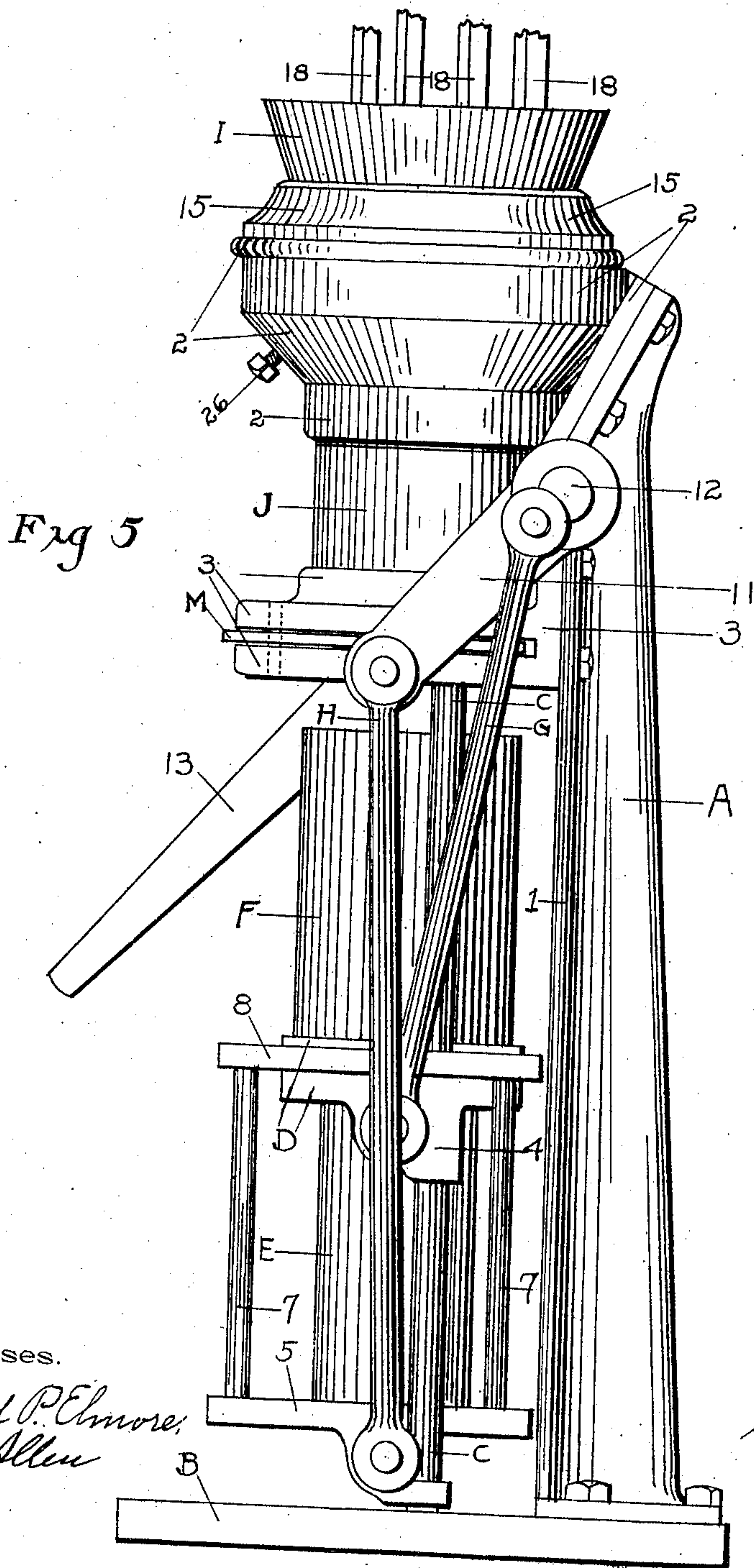
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Patented Mar. 14, 1911.
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MACHINE FOR MAKING TILE AND THE LIKE.

986,448.

Specification of Letters Patent.

Patented Mar. 14, 1911.

Application filed April 1, 1908. Serial No. 424,475.

To all whom it may concern:

Be it known that I, CHARLES G. ELMORE, a citizen of the United States, residing at Jackson, in the county of Jackson and State of Michigan, have invented a certain new and useful Improvement in Machines for Making Tile and the Like, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to machines for making tile and similar articles.

Prominent objects of the invention are to provide a simple, practical and effective machine for making such articles, to arrange for the easy and ready operation and control of the same, to assure a high degree of efficiency in the use of material and operation of the machine, and to accomplish the foregoing and other desirable results in a simple and expeditious manner.

In the accompanying drawings, Figure 1 is a mixed perspective and sectional view of the said machine, the section being taken upon a vertical plane erected upon line *a a*, Fig. 1. Fig. 2 is a perspective view of plate K with the upper core L attached thereto. Fig. 3 is a perspective view of the tile jacket F. Fig. 4 is a sectional view of ring or collar D taken on a vertical plane erected on the line *a a*, Fig. 1. Fig. 5 is a side elevation of the machine showing parts in discharging position.

The machine which I have shown in the drawings for carrying out my invention is provided with a base B, from which arises the perpendicular standard A, having a flange 1 extending longitudinally of the front side and having a slanting top portion to which is bolted the bowl-shaped ring or collar 2, while just below upon the perpendicular portion of said flange is bolted the double ring or collar 3. From the lower portion of the double ring or collar 3 and upon either side of the machine the guide-rods C extend perpendicularly downward to the base B, having both ends thereof rigidly attached in the position represented. The parts described thus provide a rigid framework forming supports and guide-ways for the various operating parts of the machine, which include a tamper and feed device 19—21, an annular chamber, having a fixed upper portion and a movable lower

portion, means for actuating the movable lower portion, and a cut-off M.

The ring or collar D, Figs. 1, 4 and 5, fits loosely and slidably about the core E, forming a floor for the annular chamber, hereinafter described, and is provided with a flange upon its upper surface, Fig. 4, to support and retain the jacket F, Figs. 1 and 3. The said ring or collar D is also provided with an offset 4, Figs. 1, 4 and 5, which is conveniently shaped and bored to form a guide by which it is mounted for slidable attachment upon the guide-rods C. The said offset 4 is also conveniently shaped to provide a pivotal attachment for the connecting-rod G. Said offset 4 as arranged for guide and pivotal attachment described is duplicated upon the opposite side of said ring D.

The core E is a hollow cylinder closed at the top, of suitable dimensions, being slightly larger at the bottom where it is provided with a flange 5, said flange being provided with a plurality of offsets 6 6, from each of which arises a rod or bar 7 7. These rods or bars support the ring or collar 8 at their top, thus forming a rigid frame or cage 5—8, in the center of which is the core E. The said cage 5—8 is provided with the offsets 9 upon the ring 8 and offset 10 upon the flange 5, both of said offsets being in duplicate and conveniently shaped and bored to form guides to engage the duplicate guide-rods C upon either side of the machine, thus providing a rigid and suitable carriage for the vertical reciprocation of the core E. Said offsets on ring 8 are supplementary guides for use in larger machines and may be omitted, together with ring 8 and the supporting rods 7 in smaller machines.

To maintain the cage 5—8 with the core E, also the ring or collar D with the jacket F, in their proper position and relation both at rest and in reciprocation upon the guide-rods C, the connecting rods G and H are pivotally attached at their lower ends to the offsets 4 and 10 respectively, while the upper end of the connecting-rod H is similarly attached to the upper end of the arm 11, and the upper end of the connecting-rod G is also similarly attached to the arm 11 near the shaft 12. Upon the opposite side of the machine is a precisely similar arrangement, except that the arm upon the

opposite end of the shaft 12 is elongated above the upper attachment of the longer connecting-rod H, forming the lever 13, both arm 11 and lever 13 being keyed to the shaft 12. To reach its upper or normal position the lever 13 passes somewhat beyond the center of rotation and comes to rest at stable equilibrium upon the offset 14 upon the ring or collar 2, thus maintaining the core E, the cage 5—8, the ring or collar D, the jacket F firmly in their upper or normal position.

The arrangement of the above parts is such that while in their upper or normal position, the jacket F being supported upon the ring or collar D within the flange thereon, Fig. 4, the top of the said jacket F is confined within the lower portion of the double ring or collar 3, and the core E is supported within the said jacket F, is concentric therewith, and being of somewhat less diameter and of equal height, an annular chamber or tile-mold is formed, of which the ring or collar D is the floor. Further, the arrangement of the above parts is such that when the lever 13 is rotated forward and downward to its lower position Fig. 5, the ring or collar D is actuated downward by the connecting rod G; while the cage 5—8, with the core E is actuated much further downward by the connecting rods H bringing the top of the core E approximately to the plane of the bottom of the jacket F. In this manner, the jacket is disengaged, may be removed and another substituted.

The bowl-shaped ring or collar 2, bolted to the top of the standard A, is provided with a plurality of horizontal off-sets 16, extending around the inner circumference near the top thereof. It is also provided with the adjustable stop 26. The ring or collar 15 is adapted to support the hopper I, to fit loosely within and rest upon the top of ring or collar 2 without being in contact with plate K. The double ring or collar 3 is arranged for guides and attachment of the cut-off M, rigidly supports the jacket J and the guide rods C, and detachably supports the jacket F.

The plate K is saucer-shaped, having a flat bottom and provided with a horizontal flange extending outwardly from the top thereof by which it is rotatably supported upon the offsets 16 upon the inner surface of the ring or collar 2. It is also provided with two offsets or stops 25 arranged to interfere with the adjustable stop 26 in the ring or collar 2 in such a manner as to limit the rotation of plate K and the tamper and feed device 19—21 to the length of the tamping irons 19. The plate K is provided with a flat bottom, which also constitutes the floor of the hopper I without being in contact with the sides thereof. On the under side of said bottom is a circular flange con-

centric with and substantially equal in diameter to the core E below. Upon said circular flange is rigidly attached a hollow cylinder or upper core L, concentric with and substantially equal in diameter to the core E. Said cylinder is conveniently constructed of thin metal, extends downward and terminates slightly above the cut-off M. J is an upper jacket conveniently constructed of thin metal, is concentric with the upper core L, is rigidly attached at the top, within the ring or collar 2, and at the bottom within the upper portion of the double ring or collar 3, the upper core L and the core E being equal in diameter and the jacket J being equal or greater in diameter than the jacket F, and all being concentric about the same vertical axis. A supplemental annular chamber or upward extension of the tile-mold is formed of equal or greater diameter than the said tile-mold thus providing for the efficient operation of the tamper and feed device 19—21 and affording, in connection with the slots 17, Fig. 2, a passage from the hopper I to the tile-mold. Plate K is also provided with one or more slots or cut-away portions 17, Fig. 2, curved in conformity to the annular chamber below and arranged to form one or more passages or openings from the hopper I to the said annular chamber for the passage of material and also to accommodate the tamper and feed device, hereinafter described.

The tamper and feed device consists of one or more curved tamping-irons 19, alternating with an equal number of vertical rows or ranks of horizontal curved feed-bars 20, all supported upon one or more perpendicular rods 18, forming a rigid cylindrical framework conforming to the annular chamber in which they operate, said rods 18 being somewhat longer than the combined height of the entire annular chamber and hopper and having a handle 21 attached to the upper ends as shown in Fig. 1.

The cut-off M consists of a disk having a handle and is conveniently pivoted between the upper and lower portions of double ring or collar 3 in such a manner that when the tamping device 19—21 is raised above it, the said cut-off may be swung backward, passing entirely through between the upper and lower parts of said ring or collar 3, also between the upper core L and the main core E, thus forming a partition dividing the annular chamber into upper and lower portions. In this position, it forms a floor for the upper annular chamber upon which may rest the contents thereof, including the tamping device 19—21.

Fig. 3 represents the jacket F in its opened or relaxed condition. It is conveniently constructed of a sheet of somewhat elastic metal rolled into the form of a pipe or hollow cylinder of proper dimensions to fit the

supporting rings D and 3. A strip of metal 22, Fig. 3, is doubled upon itself at one edge and riveted to one edge of the jacket F, extending longitudinally of its outer surface 5 so as to form a recess to receive and retain the other edge thereof. One or more short springs 23 are riveted transversely of one edge, projecting somewhat beyond, the free end of said spring, being turned outward 10 and perforated with a hole to engage a pin 24 in the opposite edge when closed. When the spring is actuated to release the pin, the jacket opens. The lower end of the said jacket is turned inwardly, forming a narrow 15 ledge or support for the tile or other article, when the same is being removed from the machine. Said edge or support may be notched or cut, in order that the jacket may retain its elasticity. A suitable number of 20 jackets may be provided so that the tiles or other articles may be formed therein and so retained until hardened.

The operation of the device is as follows: The parts of the machine being in position 25 as represented, the hopper I is filled with a suitable mixture, from which the tile or other article is to be formed, such as cement, sand and water. The tamper and feed device 19—21 is raised, and then together with 30 plate K is rotated horizontally as far as the stops 25 and 26 will permit. It is then actuated forcibly downward, then raised and rotated in the other direction as far as said stops will permit, then actuated downward 35 as before. At each downward reciprocation of the tamper and feed device 19—21, a portion of the mixture is carried from the hopper I, by the curved feed-bars 20 through the curved slots 17, Fig. 2, and precipitated 40 through the upper annular chamber into the lower annular chamber or tile-mold between the tamping irons 19. As the length of the said tamping irons, the space between them, and the distance the tamper and feed 45 device 19—21 is rotated are equal, the material deposited between the tamping irons at one downward reciprocation is tamped at the next. The above described operation is repeated until the annular chamber is filled 50 above the cut-off M with compressed material. The said cut-off M is then actuated backward between the above described upper and lower annular chambers, leaving the completed tile in the lower annular chamber 55 or tile mold, while the contents of the upper annular chamber, together with the tamper and feed device 19—21 is supported upon the said cut-off M. The lever 13 is then rotated forward and downward actuating arm 11 in unison therewith, thus actuating the connecting rods H, which in turn actuate the cage 5—8 and the core E downward. At the same time, connecting rods G 60 are actuated, which in turn actuate ring D, 65 and the jacket containing the tile downward

a much less distance. When the lever 13 reaches its lowest position Fig. 5, the core has been extracted from the tile, and the cage 5—8 is below the jacket F, while the said jacket is disengaged from the retaining 70 ring 3, thus allowing the free removal of the jacket and its contents. Another jacket is substituted, the lever 13 is rotated upward, bringing the core E, the ring D, and the jacket F to their upper or normal position, 75 where they are firmly maintained. The operation may then be repeated.

It will be understood that changes and modifications may be made in the machine herein set forth without departing from the 80 spirit of my invention.

I am aware that prior to my invention tile machines have been made with cores, jackets and tampers. I, therefore, do not 85 claim such a combination broadly, but

I claim as my invention:

1. The combination in a tile machine of a tamper and feed device consisting of one or more tamping irons, an equal number of vertical ranks or rows of horizontal feed- 90 bars supported upon one or more perpendicular rods; all combined together in a rigid structure so as to conform to an annular chamber, in which it operates, all substantially as described and for the pur- 95 pose specified.

2. The combination in a tile machine of a combined tamper and feed device consisting of one or more tamping-irons, an equal number of vertical rows or ranks of hori- 100 zontal feed-bars supported upon one or more perpendicular rods, all combined together in a rigid structure so as to conform to an annular chamber in which it operates, with a circular rotatable plate bearing upon 105 which the said plate is mounted for horizontal rotation, said bearings being isolated and arranged to avoid clogging, said plate being provided with one or more curved slots or cut-away portions to accommodate 110 said perpendicular rods and feed-bars, all substantially as described and for the purpose set forth.

3. The combination in a tile machine of a combined tamper and feed device consisting 115 of one or more tamping-irons, an equal number of vertical rows or ranks of horizontal feed-bars supported upon one or more perpendicular rods, all combined together so as to conform to an annular chamber in 120 which it operates, with a hopper, a rotatable plate forming a bottom thereto, said plate being provided with one or more curved slots or cut-away portions, with a supplemental core dependent from said rotatable 125 plate, a supplemental jacket rigidly supported concentrically about said core, forming the upper portion of the said annular chamber, all substantially as described and for the purpose set forth. 130

4. The combination in a tile machine of a combined tamper and feed device consisting of one or more tamping irons, an equal number of vertical ranks or rows of horizontal feed-bars supported upon one or more perpendicular rods, all combined together in a rigid structure so as to conform to an annular chamber in which it operates, with a hopper, a rotatable plate forming the bottom thereto, said plate being provided with one or more curved slots or cut-away portions, with a supplemental core dependent from said rotatable plate, a supplemental jacket rigidly supported about said core, forming a portion of said annular chamber, and a cutoff, all as described and for the purpose specified.

5. In a tile machine, the combination of a core provided with guides, a ring or collar loosely fitting about said core, supporting and retaining a jacket equal in height but of somewhat greater diameter and concentric therewith, said ring or collar being also provided with guides, guide-ways engaging said guides on said core and ring or collar adapted for the vertical reciprocation of said core and ring or collar; means for raising and lowering the same simultaneously but unequally, so that in their upper position said core is entirely within said jacket forming an annular chamber or tile mold, while in the lowered position said core is withdrawn from said jacket, all substantially as described and for the purpose set forth.

6. In a tile machine, a hopper having a separable, rotatable bottom provided with one or more curved slots or cut-away portions to accommodate a combined tamper and feed device as described, said rotatable bottom being arranged with an adjustable stop to allow free rotation or to limit said rotation as desired, all substantially as described and for the purpose set forth.

7. In a tile machine, a hopper supported within a bowl-shaped ring or collar, which also supports a rotatable bottom to said hopper, a combined tamper and feed device operating through one or more slots or cut-away portions in said rotatable bottom, substantially as described and for the purpose specified.

8. In a tile machine, the combination of a tamper and feed device, a hopper having a rotatable bottom provided with one or more curved slots or cut-away portions to accommodate a tamper and feed device, a supplemental core attached to the under side of said rotatable bottom, a supplemental jacket inclosing said core and concentric therewith, a lower core arranged above the same vertical axis and mounted by guides and guide-ways for vertical reciprocation, and means for such reciprocation of the said lower core,

all substantially as described and for the purpose set forth.

9. In a tile machine, the combination of a hopper having a rotatable bottom provided with one or more slots or cutaway portion, with an annular chamber arranged with fixed and movable walls consisting of a fixed core and jacket and a movable core, jacket and a ring or collar slidably adapted to said movable core, all concentrically arranged about a vertical axis, and a cutoff, substantially as described and for the purpose specified.

10. In a tile machine, the combination of a hopper having a rotatable bottom provided with one or more slots or cutaway portions with an annular chamber arranged with fixed and movable walls consisting of a fixed core and jacket, a movable core, jacket, and a ring or collar slidably adapted to said movable core, all concentrically arranged about a vertical axis substantially as described.

11. In a tile machine, the combination of a hopper having a rotatable bottom provided with one or more slots or cutaway portions, with an annular chamber arranged with fixed and movable walls consisting of a fixed core and jacket and a movable core, jacket, a ring or collar, concentrically arranged about a vertical axis, a cutoff, means for simultaneously but unequally raising and lowering the movable core and ring or collar and jacket so that in their lowered position the jacket is disengaged and another may be substituted and the movable parts returned to their upper or normal position, all substantially as described and for the purpose specified.

12. The combination in a tile machine of a combined tamper and feed device consisting of one or more tamping-irons, one or more vertical ranks or rows of feed bars and one or more perpendicular rods, all rigidly combined in a hollow cylindrical structure conforming to an annular chamber, a hopper having a rotatable bottom provided with curved slots or cutaway portions for the accommodation of the tamper and feed device, an annular chamber, in which the tamper and feed device operates, arranged with fixed and movable walls consisting of a fixed core and jacket, a movable core, ring or collar, and jacket arranged concentrically about a vertical axis, a cutoff, means for simultaneously but unequally raising and lowering the movable core, ring or collar, and jacket so that in their lowered position the jacket is disengaged and another may be substituted, all substantially as described and for the purpose specified.

13. In a tile machine, the combination of an annular chamber or tile mold comprising the core E, the relaxable jacket F and its

supporting ring or collar D, with a supplemental annular chamber comprising the upper core L and the upper jacket J, the cutoff M, the hopper I, having the rotatable bottom K provided with one or more curved slots, or cutaway portions 17, a combined tamper and feed device 19—21, means for vertically reciprocating the core E and the jacket F simultaneously but unequally, consisting of guide rods C and connecting rods G and H, arm 11, shaft 12 and lever 13 with the pivotal connections thereof, substantially as described and for the purpose set forth.

14. In a tile machine the combination of tamper and feed device with a hopper having a rotatable bottom provided with one or more curved slots or cutaway portions to accommodate a tamper and feed device, a tile-

mold composed of a movable core provided with guides and guideways for the vertical reciprocation of same and means for such reciprocation, and a jacket detachably mounted on a ring, or collar, provided with guides and guideways for the vertical reciprocation of said ring or collar, means for such reciprocation, a tamper and feed device and a cut-off, all substantially as described and for the purpose set forth.

In witness whereof I hereunto subscribe my name this 19th day of March, A. D., 1908.

CHARLES G. ELMORE.

Witnesses:

JAMES S. ALLEN,
JEANNETTE WENGER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
