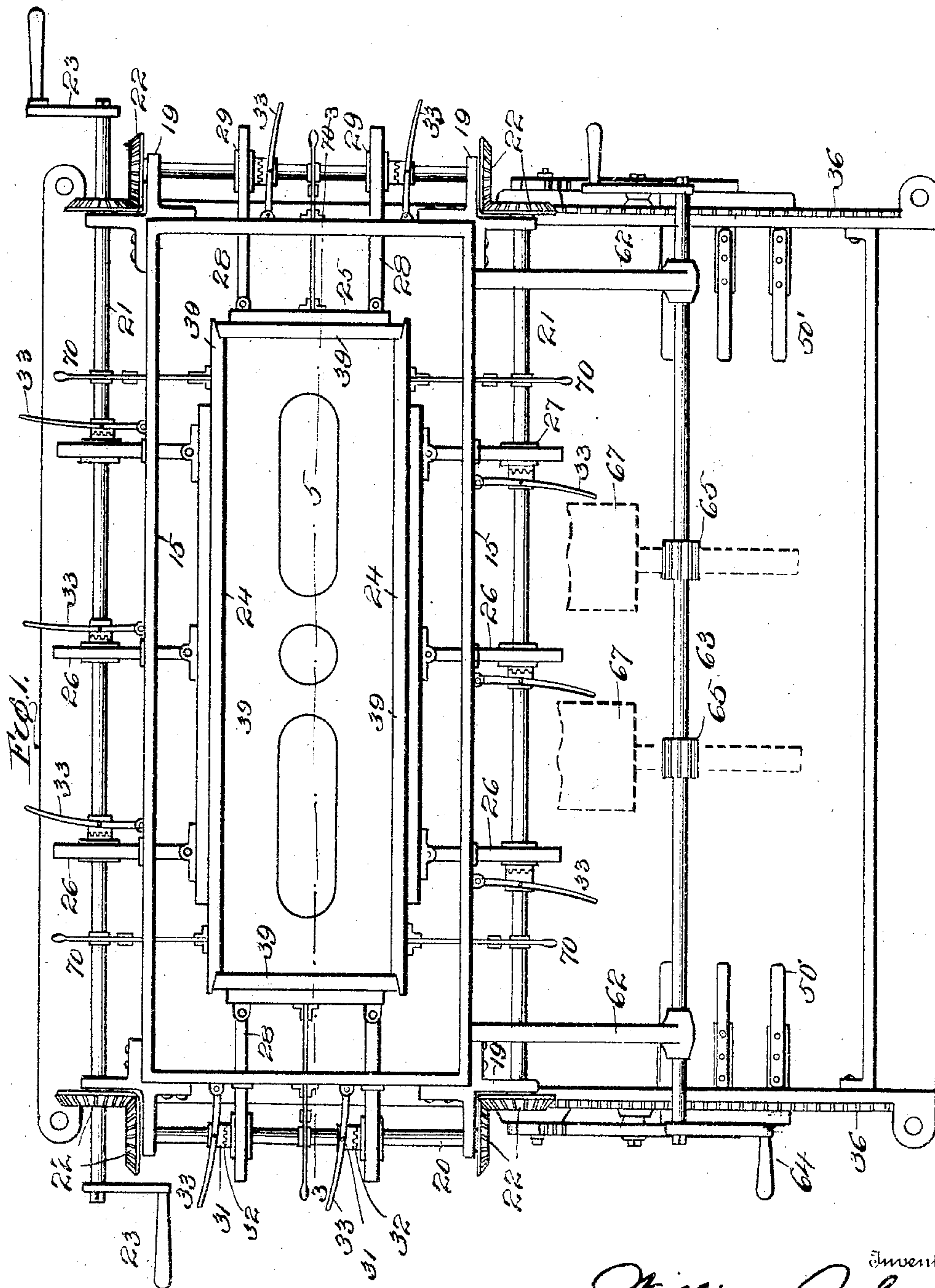


No. 779,976.

PATENTED JAN. 10, 1905.

W. J. STERLING.  
MOLDING MACHINE.  
APPLICATION FILED MAR. 7, 1904.

5 SHEETS—SHEET 1.



Witnesses

J. M. Fowler Jr.  
Edgar M. Kitchen

Inventor

William J. Sterling

By

Marion L. Lawrence  
Attorney, S.

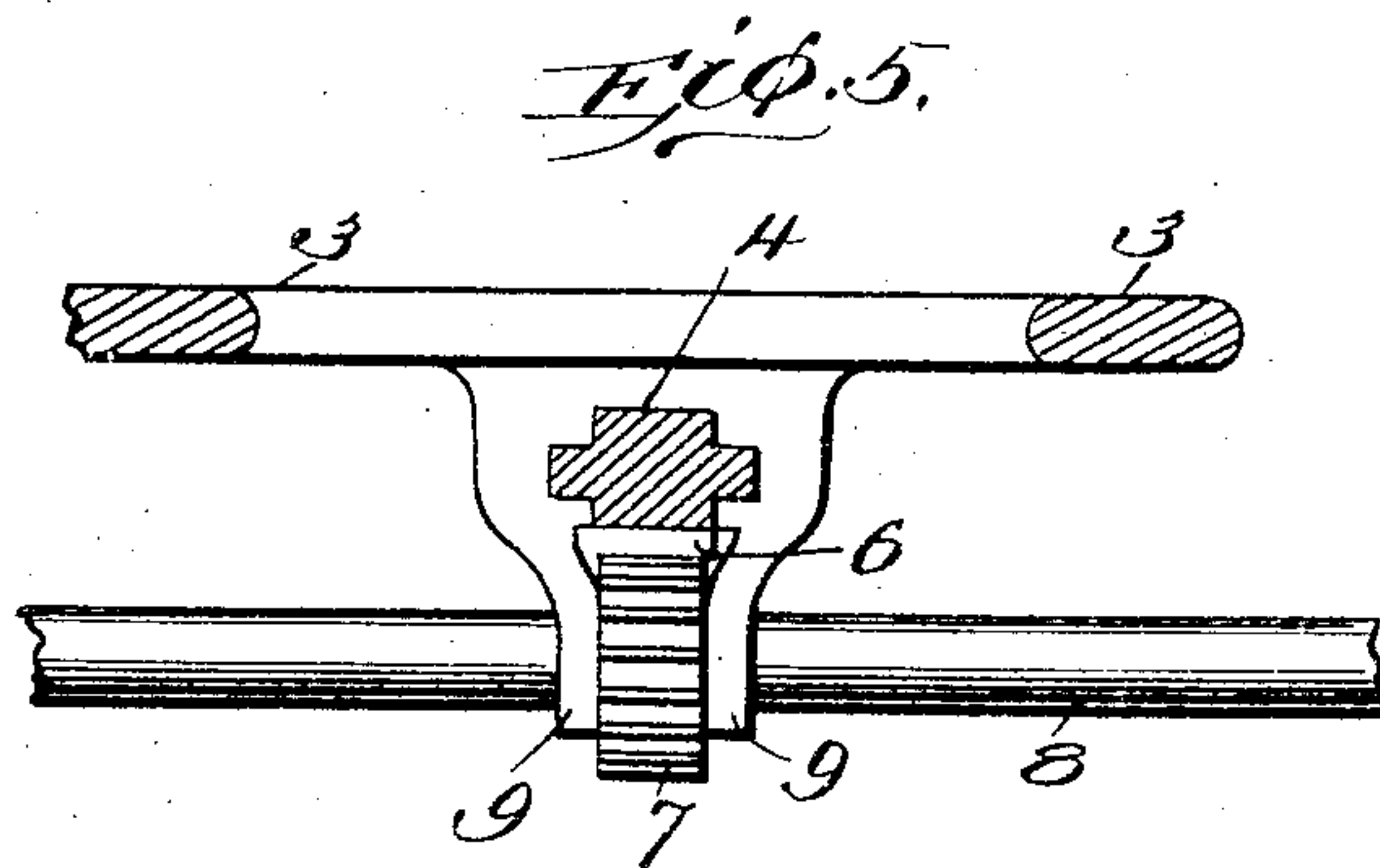
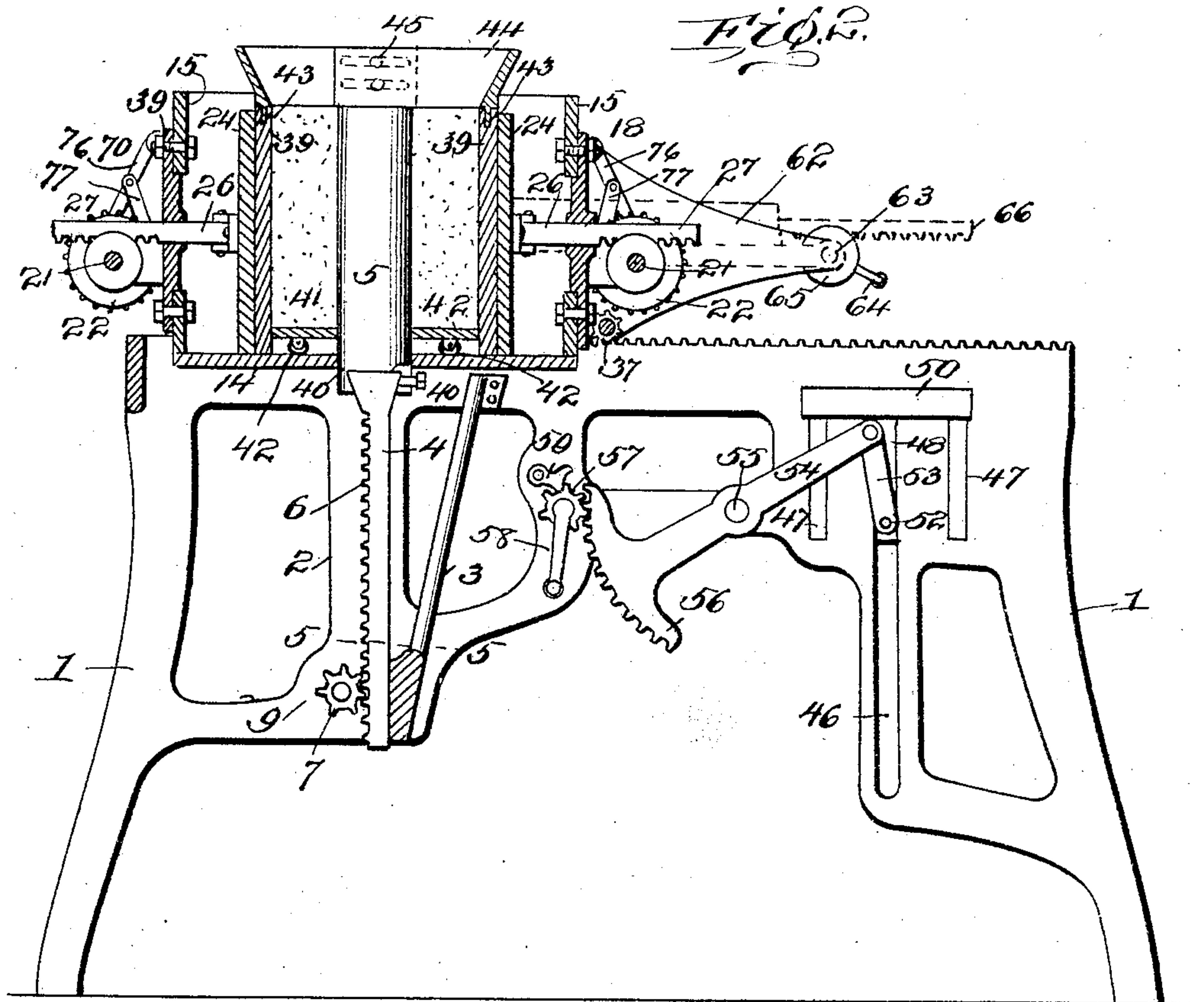
No. 779,976.

PATENTED JAN. 10, 1905.

W. J. STERLING.  
MOLDING MACHINE.

APPLICATION FILED MAR. 7, 1904.

5 SHEETS—SHEET 2.



Witnesses  
J. M. Fowler Jr.  
Edgar M. Kitchen

Inventor  
William J. Sterling  
By  
Mason Jennings Lawrence  
Attorney S.

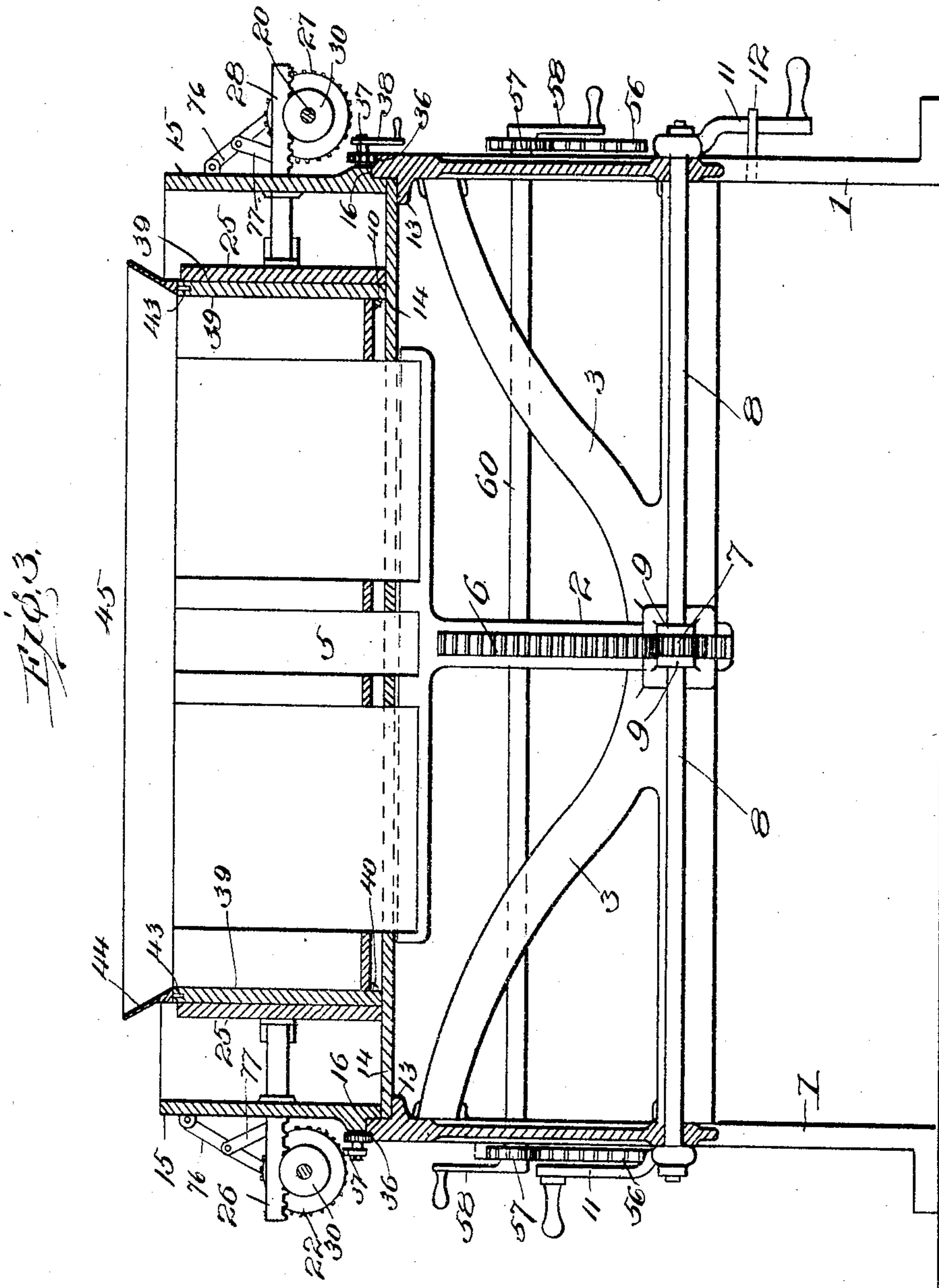
No. 779,976.

PATENTED JAN. 10, 1905.

W. J. STERLING.  
MOLDING MACHINE.

APPLICATION FILED MAR. 7, 1904.

5 SHEETS—SHEET 3.



Witnesses

J. M. Fowler Jr.  
Edgar M. Kitchen

Inventor

William J. Sterling

By

Mason Faint Lawrence  
Attorney



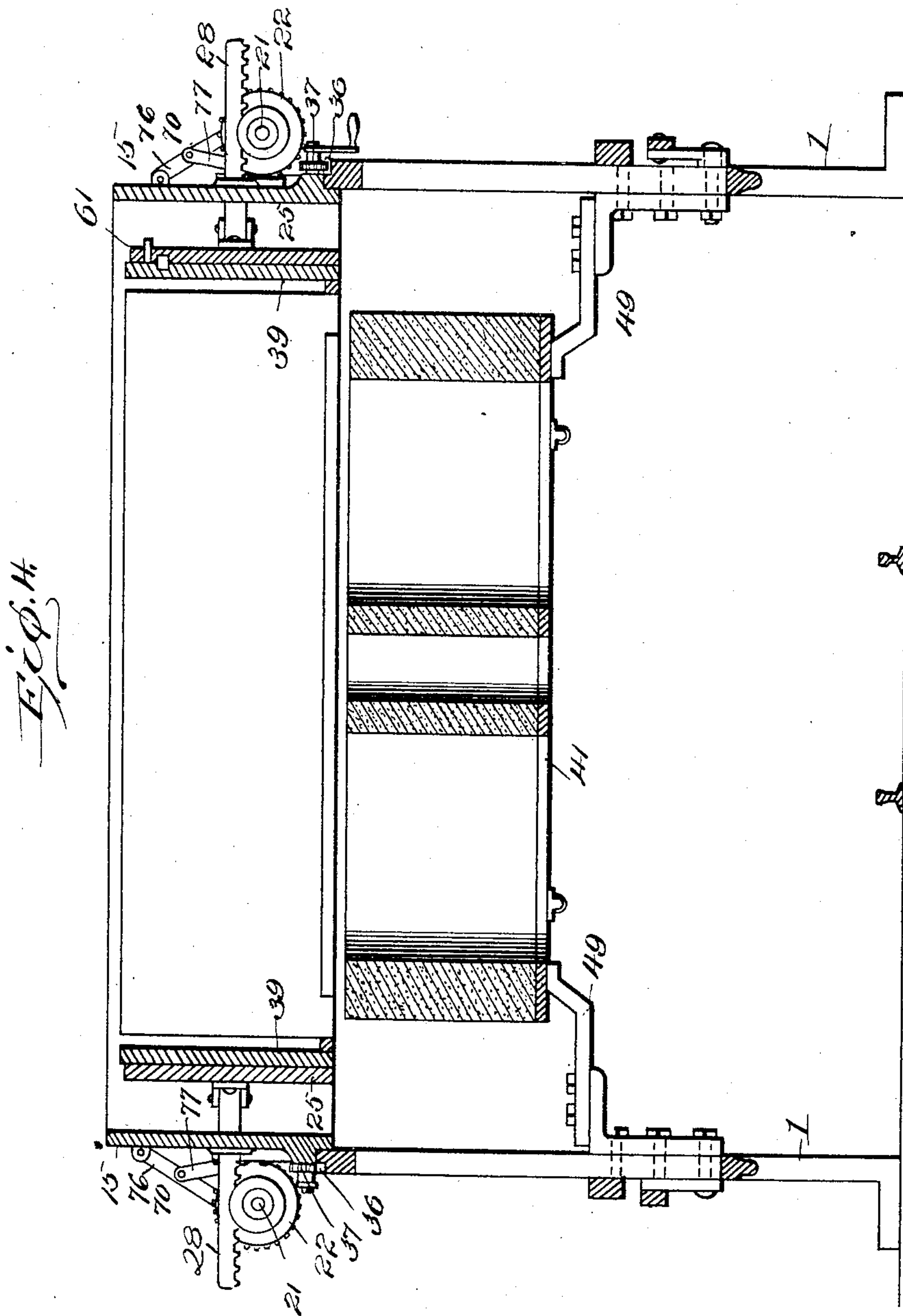
No. 779,976.

PATENTED JAN. 10, 1905.

W. J. STERLING.  
MOLDING MACHINE.

APPLICATION FILED MAR. 7, 1904.

5 SHEETS—SHEET 4.



Witnesses

*J. M. Fowler Jr.*  
*Edgar M. Kitchen*

Inventor  
*William J. Sterling*  
By *Maxon Fenwick Lawrence*  
Attorney & S.

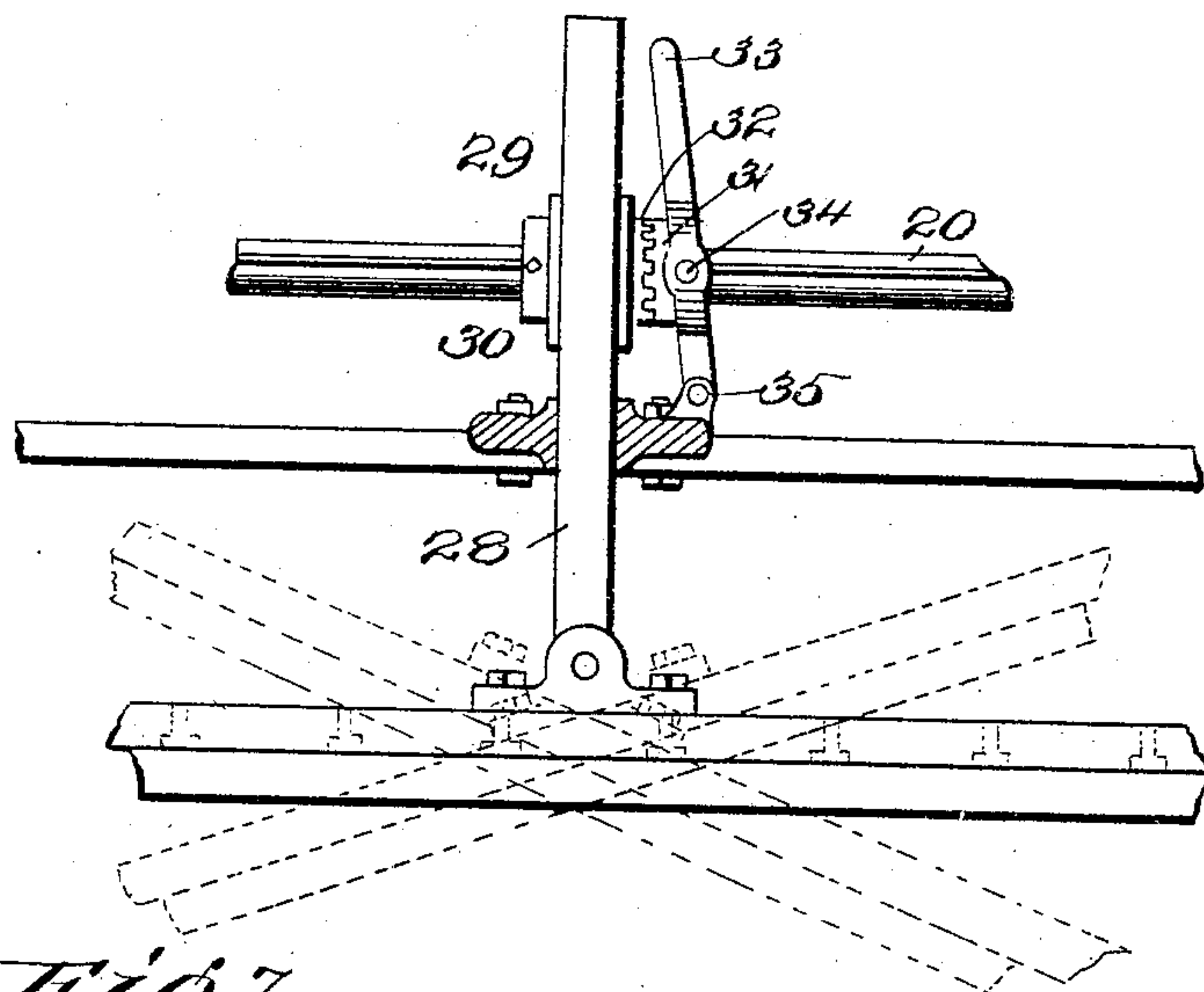
No. 779,976.

PATENTED JAN. 10, 1905.

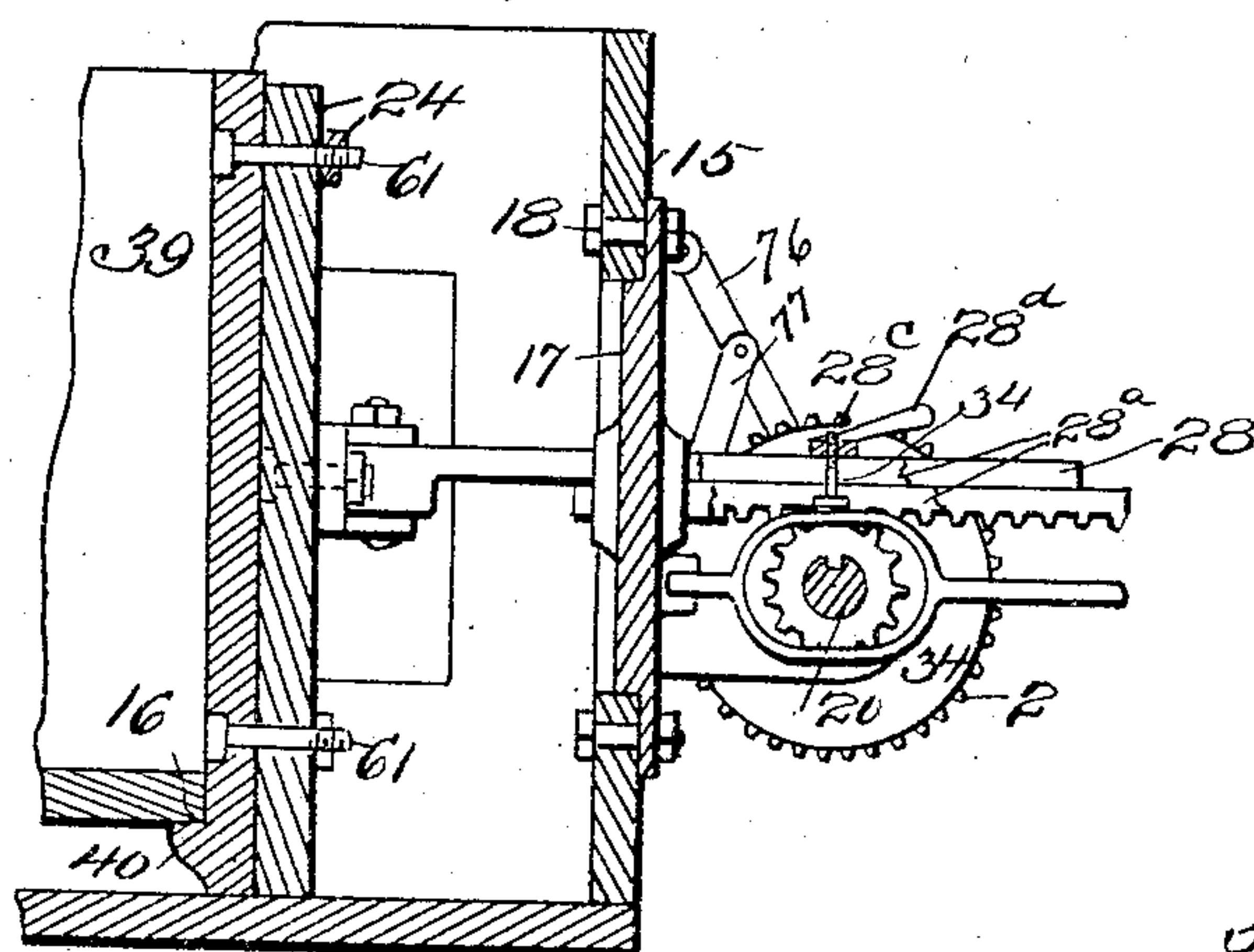
W. J. STERLING.  
MOLDING MACHINE.  
APPLICATION FILED MAR. 7, 1904.

5 SHEETS—SHEET 5.

Fig. 6.



*Fig. 7.*



Frø. 8.

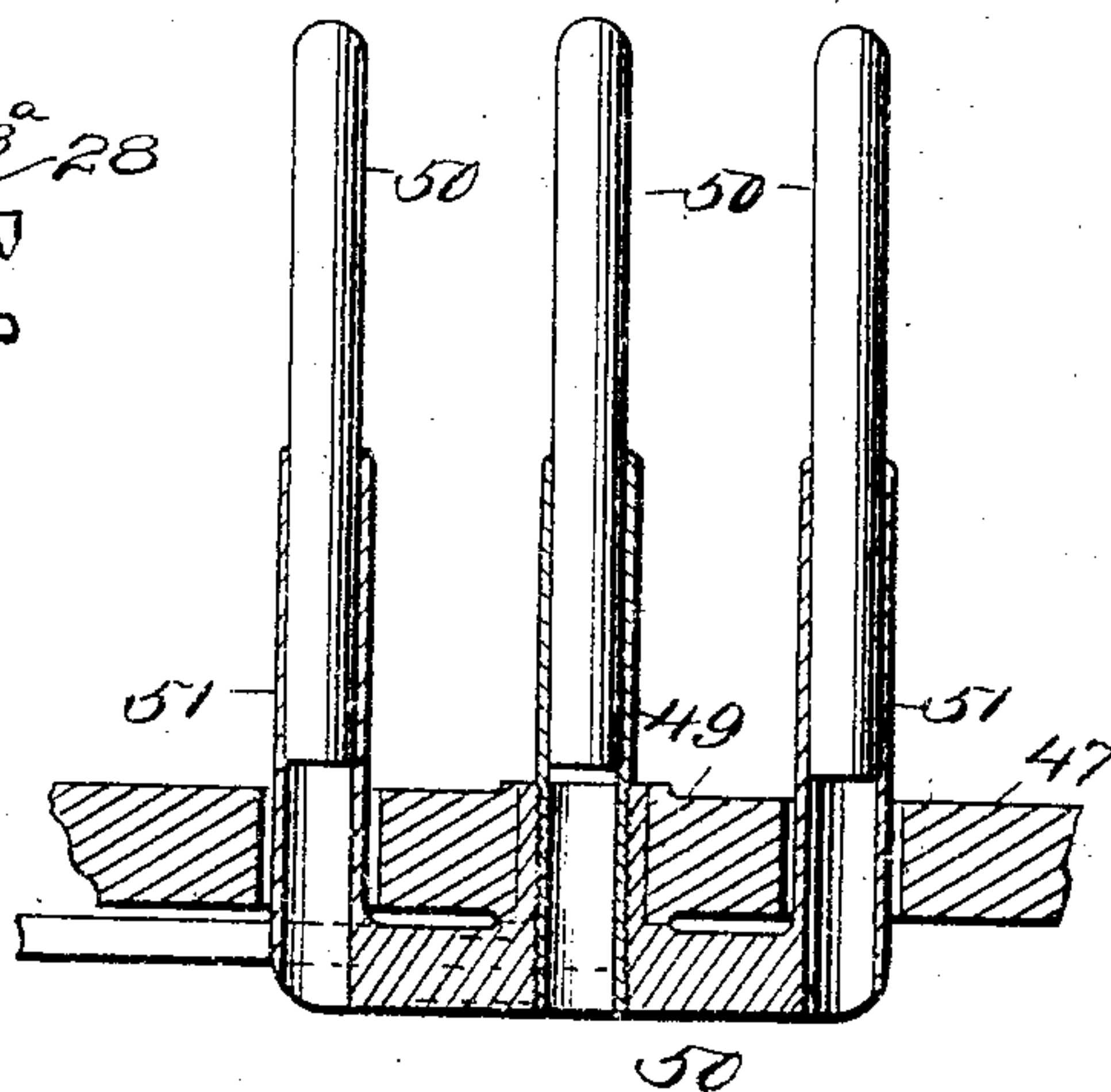
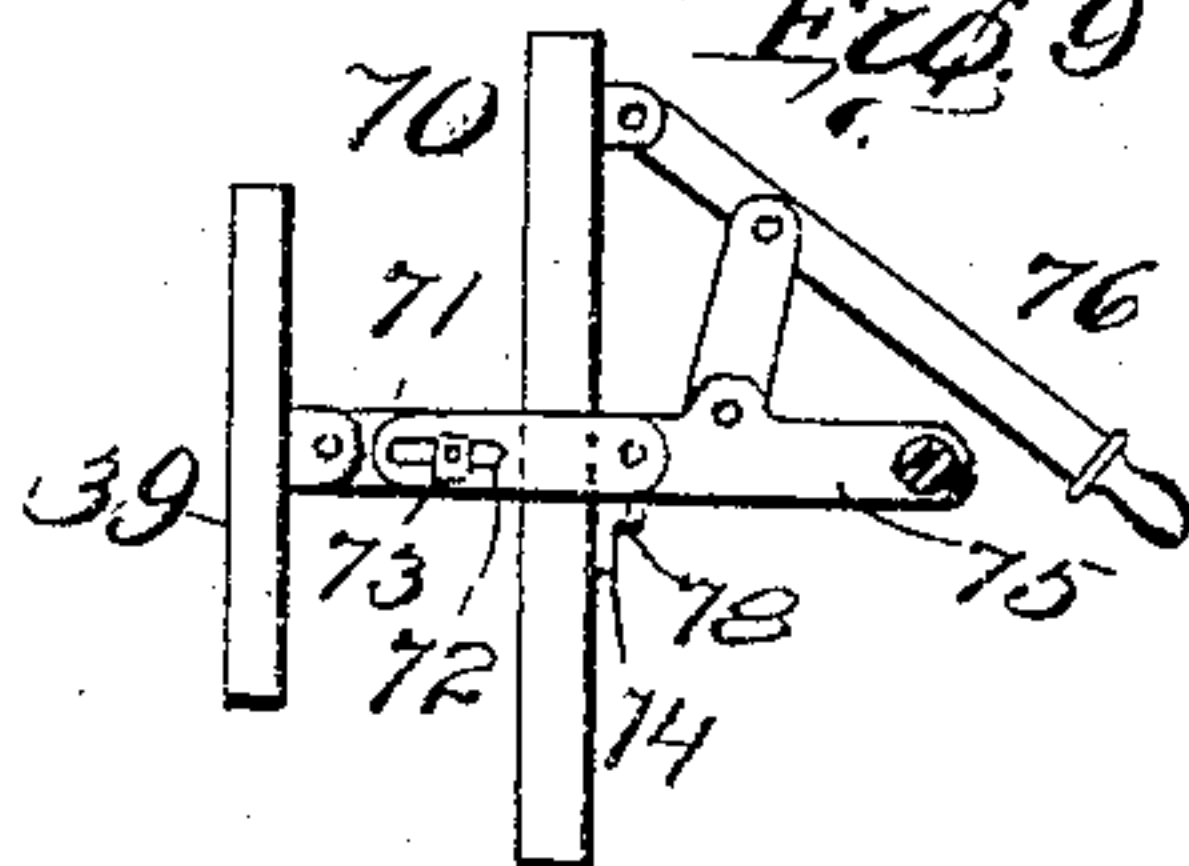


Fig 9



Witnesses

J. M. Fowler Jr.  
Edgar M. Kitchen

Inventor

Inventor  
William J. Sterling

334

Mason Tevin Howard  
Attorney S.

Attorney's



# UNITED STATES PATENT OFFICE.

WILLIAM J. STERLING, OF NORFOLK, VIRGINIA, ASSIGNOR OF TWO-THIRDS TO A. S. J. GAMMON AND C. C. GRAVES, OF NORFOLK, VIRGINIA.

## MOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 779,976, dated January 10, 1905.

Application filed March 7, 1904. Serial No. 197,045.

*To all whom it may concern:*

Be it known that I, WILLIAM J. STERLING, a citizen of the United States, residing at Norfolk, in the county of Norfolk and State of Virginia, have invented certain new and useful Improvements in Molding-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in building-block-making mechanism, and more particularly to that class employed for producing hollow blocks or bricks.

The object in view is the provision of means for facilitating the production of building-blocks of various sizes and shapes and means in combination therewith for facilitating the delivering of a finished block from the forming mechanism.

With this and further objects in view the invention consists in certain novel constructions, combinations, and arrangements of parts, as will be hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 represents a top plan view of a building-block-making mechanism embodying the features of the present invention. Fig. 2 represents a longitudinal vertical central section taken therethrough, parts being illustrated in elevation. Fig. 3 represents a transverse vertical section taken on the plane of line 3 3 of Fig. 1. Fig. 4 represents a transverse vertical central section taken through the parts in a discharged position. Fig. 5 represents an enlarged detail fragmentary section taken on the plane of line 5 5 of Fig. 2. Fig. 6 represents an enlarged detail fragmentary view illustrating one of the clutch mechanisms and surrounding parts. Fig. 7 represents an enlarged transverse fragmentary section taken on the plane of line 7 7 of Fig. 1. Fig. 8 represents an enlarged horizontal fragmentary view illustrating the supporting fingers in elevation. Fig. 9 represents an enlarged detail view of one of the mold-locking devices detached.

Referring to the drawings by numerals, 1 indicates a supporting framework or bed made

up of suitable sides spaced apart and connected by braces for supporting the operating parts of the present improved structure. A vertical standard 2 is carried by suitable transverse braces 3 3, connecting the said sides of the frame 1, and said standard 2 is formed with a longitudinal dovetailed or undercut groove within which moves a vertical rod 4 of plunger-head 5. The rod 4 is shaped to fit within the groove in the standard 2 so as to be limited against lateral play, and a rack 6 is formed integral with or secured to the exposed edge of said bar. A pinion 7 meshes with said rack 6 and is carried and driven by a shaft 8, mounted in brackets 9 9 extending from one side of standard 2, and journaled in the sides of frame 1. A crank or other operating means 11 is secured to each end of shaft 8 for facilitating rotation thereof for causing vertical reciprocation of the plunger 5. A pin 12 may be removably introduced into an aperture in one of the sides of frame 1 in the path of movement of one of the cranks 11 for retaining the same in a given position, whereby the plunger-head 5 may be locked in the position indicated in Fig. 3.

The sides of frame 1 are provided near their upper edges with inwardly-projecting flanges 13 13, upon which rests a bed-plate 14, apertured for permitting the passage of the plunger-head 5. An inclosing casing 15 rests with its lower edge upon the bed-plate 14, the end pieces of said casing being provided with outwardly-projecting shoulders 16, resting upon the upper edge of the sides of framework 1, and each side piece of said casing being made up of strips of material spaced apart and secured together by a connecting-plate 17, secured to said strips by removable bolts 18 18. The plates 17 are shorter than the sides of the casing 15 and may be adjusted along said sides to any given position by the removal and replacing of the bolts 18. To each corner of the casing 15 is secured a right-angle bracket 19, said brackets forming bearings for end shafts 20 20 and side shafts 21 21, each of said shafts being formed with a beveled gear 22 at each end outside its flanges of



the corner-brackets, all of said gears being normally in mesh, whereby rotation of one of said shafts is designed to effect synchronous rotation of all the others. Suitable cranks or other operating means 23 are preferably carried by one of said shafts for facilitating actuating the same. Within the casing 15 are arranged side mold-retaining pieces 24 and end mold-retaining pieces 25. To each of the side pieces 24 are pivotally connected suitable rack-bars 26 26, which extend through apertures in the side plates 17, and the racks of said bars mesh with pinions 27 27, carried by the shafts 21. Rack-bars 28 28 are pivotally connected to the end pieces 25 and extend through the end walls of casing 15, said racks meshing with pinions 29, carried by the shafts 20. Each pinion 27 and 29 is provided with a clutch mechanism, generally referred to by the numeral 30, one of said clutches being illustrated in detail in Fig. 6. As all of the clutches 30 are made exactly alike, a disclosure of one will be applicable to all. Each clutch mechanism 30 consists of an engaging sleeve 31, movable longitudinally of the shaft 20, said sleeve being formed with locking-teeth designed to engage teeth 32, carried by the pinion 29. An operating-lever 33 pivotally engages the sleeve 31 by means of pins 34, extending into a peripheral groove in said sleeve 31, said lever 33 being pivotally connected, as at 35, to the casing 15. The sides of frame 1 which extend beyond the casing 15 are formed with tooth-racks 36 36, with which mesh the teeth of pinions 37 37, carried by the ends of casing 15. The shoulders 16 16 rest upon the upper edge of said sides, so that when the pinions 37 are rotated the casing 15 and contained elements will be moved longitudinally of the frame 1. A suitable crank or other operating means 38 may be applied to the pinions 37 for effecting actuation of the same.

Retained in position by the side and end pieces 24 and 25 are the mold-plates 39 39, which plates may be of any preferred shape and size for producing the form of building-block desired. The lower edges of the plates 39 are provided with inwardly-projecting lugs 40 40, adapted to support a pallet 41, said pallet being preferably provided with anti-friction-rollers 42 42 for purposes hereinafter described. The upper edges of the plates 39 are formed with suitable mortises to receive tenons 43 43, carried by the side and end walls of a removable hopper 44. The walls of the hopper 44 are divided and overlapped centrally, longitudinally, and transversely and are secured together by pin-and-slot connections 45 45 at said overlapping portion, whereby said hopper may be increased or decreased in dimension for causing the same to fit upon any size of mold.

As seen most clearly in Fig. 2, the sides of the frame 1 project beyond the frame 15 when

said frame is in its normal position. Each of the projection portions of said side pieces is formed with a vertical relatively long slot 46 and comparatively short slots 47 47, arranged parallel to and on opposite sides of the slot 46. Within the slot 46 is positioned a guiding-block 48, which is designed to be moved vertically within said slot and which, as best seen in Fig. 8, has threaded therethrough or otherwise secured thereto a tubular finger 49. A transverse bar 50 is connected with the block 48 and carries at its ends tubular fingers 51 51, extending through the slots 47, each finger 49 and 51 carrying a longitudinally-adjustable pin 50'. The lower end of the block 48 is provided with a wrist-pin 52, to which is pivotally connected a link 53, the upper end of said link being pivotally attached to an operating-lever 54. The lever 54 is pivoted intermediate its length, as at 55, and at its free end is formed with a segmental rack 56. The rack 56 meshes with an actuating-pinion 57, said pinion being provided with an operating-crank 58 and a suitable pawl 59 being pivoted to the side of the frame 1 and positioned for engaging said pinion 57 for locking the same in a given position. The mechanism seen and described with respect to one side of the frame 1 is duplicated on the other and is adapted to be actuated in unison therewith by reason of the connecting actuating-shaft 60, to which the pinions 57 are fixed.

In operation the parts are assembled as illustrated in Figs. 1, 2, and 3, and the building-block material is introduced through the hopper 44 about the plunger-head 5, said plunger-head being made up of as many sections as desired for producing the desired number of openings within the building-block. The mold side pieces 39 may be, as above suggested, of any desired shape for giving the preferred contour to the block being formed. The material introduced to the hopper 44 is tamped by hand or in any preferred manner about the plunger-head 5 upon the pallet 41 until the mold is filled. As soon as the block is completed the pin 12 is moved and the shaft 8 permitted to rotate, whereby the plunger-head 5 is caused to descend until its upper edge arrives at a horizontal plane below or flush with the plane of the upper surface of the bed-plate 14. The cranks 38 are next rotated for causing the pinions 37 to walk upon the racks 36. This operation effects the movement of the casing 15 and surrounding parts along the frame 1, leaving the bed-plate 14 in its fixed position. The casing 15 is moved longitudinally of the frame 1 until the pallet 41 is brought into vertical alinement with the pins 50'. When the elements arrive at this position, the pawl 59 is lifted out of engagement with the pinion 57 and the crank 58 is operated for swinging the segment 56 to the position indicated in Fig. 2, whereby the fingers 51 and 49 are actuated



and the pins 50' carried thereby are caused to contact with the opposite ends of the pallet 41. Next the cranks 23 are actuated for rotating the gears 22 and releasing the side plates 24 and end plates 25. The side pieces 24 and end pieces 25 are provided with suitable pins or other connecting means 61, removably attaching the mold-plates 39 thereto, whereby when said side and end pieces are moved by their respective rack-bars actuated by the crank 23 the said mold-plates 39 will be moved with said side and end pieces and leave the building-block just completed free to be moved vertically from the casing surrounding the same. The pinion 57 is next permitted to rotate for permitting the pallet 14, with blocks supported thereby, to descend to a plane below the plane of the lower edge of the casing 15. In practice it is customary to provide tracks 62, upon which a suitable truck is run, beneath the pallet 14 for receiving the same. When the operation described is completed, the casing 15 and inclosed elements may be returned by rotation of the pinions 36 in a reversed direction to their former movement, and when said casing 15 has been brought to the position indicated in Fig. 2 the plunger-head 5 may be projected again into position by actuation of shaft 8. The mold-plates 39 are next caused to assume their former position by rotation of gears 22, and a suitable pallet 14 is positioned, as indicated, whereupon the parts are ready for further operation. Incidentally it is observed that it is necessary after the completion of each block to remove the hopper 14 before the actuation of the gears 22 and replace the same after the mold-pieces have been returned to their normal position.

The clutch members 30 make possible the actuation of the rack-bars 26 and 28 independently each with respect to the other, whereby the side or end piece to which the particular rack is pivotally connected may be swung to almost any desired angle with respect to the racks, as indicated in Fig. 6. For instance, if a cornice is being made having other than a right angle one of the end pieces 25 might be positioned at an acute or an obtuse angle with respect to one of the side pieces 24 for the purpose of receiving the mold-pieces for such cornice. I have illustrated in Figs. 1 and 2 in dotted lines a mechanism which I propose to employ in connection with the production of cornice and other hollow building-blocks. This consists of suitable brackets 62 62, secured to one of the sides of casing 15 and forming bearings at their outer ends for a shaft 63, which is journaled in said bearings, said shaft being provided with an actuating-crank 64 and with pinions 65 65, which mesh with actuating-racks 66 66, each of said racks being connected to a plunger 67, adapted to be moved by actuation of the shaft 63 through the side of the mold and positioned

for taking the place of the plunger 5 when a cornice is being made, the side of the mold being made up of strips of material, as heretofore stated, with the removable plates 17 secured thereon, one of said plates being designed to be removed for permitting the admission of said plungers into the mold. After the said plungers have been given the position indicated within the mold the building-block material is tamped about the same and the plunger or plungers retracted, it being observed that one or more plungers may be used, as desired. After the cornice building-block has been completed the plunger or plungers 67 are retracted and the discharge of the block is accomplished in the manner above described. When applying the brackets 62 and parts operable therewith, it is necessary to provide a side piece 24, apertured for admitting the plunger 67, the side wall of the casing 15 being also similarly apertured.

Due to the excessive strain upon the mold-plates 39, said plates are liable to spring at their ends, and the ends of the side plates become spaced slightly from the end plates. In order to prevent this very seriously objectionable operation, I provide a locking means, referred to generally by the reference-numeral 70, for each end of each of the side plates and for the center of each of the end plates 39. Each of the locking devices 70 consists of a link 71, pivoted at its inner end to the respective plate 39 and formed with a longitudinal slot 72, adapted to receive the locking-bolt 73, passed through a similar slot in plate 74 and designed to lock said plate 74 to the link 71. The free end of the plate 74 is pivoted to a link 75, which in turn has its outer end pivotally engaging shaft 20 or 21, as the case may be. A lever 76 is pivoted to the casing 15 and pivotally carries a depending link 77, which link engages at its lower end the link 75. A suitable bracket 78 is fixed to the casing 15 below the point of pivotal engagement of the plate 74 with the link 75 and in the proper position for retaining said link and plate in line with each other when in their lowered position, whereby a positive lock is produced, and any lateral strain upon the respective plate 39 is sustained by the respective shaft 20 or 21.

Each of the rack-bars 26 and 28, as best seen in Fig. 7, is preferably made up of two strips of material, each formed with a longitudinal slot 28<sup>a</sup>, and a bolt 28<sup>b</sup> extends through said slots and is provided with a nut 28<sup>c</sup> at its upper end adapted to be rotated for clamping the strips comprising the bar 28 together. A handle 28<sup>d</sup> is preferably carried by the nut 28<sup>c</sup> for facilitating manual operation thereof. By the use of these elements each of the rack-bars 28 may be elongated to any desired degree to accommodate the same to molds of different sizes. This structure also greatly facilitates the quick adjustment of the said



bars when the mold is to be changed from a larger to a smaller size, or vice versa.

Having thus fully described my invention, what I claim as new, and desire to secure by

5 Letters Patent, is—

1. In a building-block-making machine, the combination with a framework, of a reciprocating plunger carried thereby, a casing normally inclosing said plunger, mold-pieces  
10 within said casing, pallet-supporting means carried by said mold-pieces, and means for moving said mold-pieces into and out of contact.

2. In a building-block-making machine, the  
15 combination with a support, of mold-carrying means mounted thereon, a removable plunger normally extending within said mold, pallet-supporting means carried by said mold, a  
20 pallet thereon, means for releasing said pallet, and means for lowering the same out of the mold.

3. In a building-block-making machine, the combination with a framework, of a vertically-reciprocating plunger, a casing surrounding the same, mold-engaging pieces  
25 within said casing, rack-bars pivotally engaging said pieces and extending beyond said casing, pinions meshing with said racks, means for operating all of said pinions, and  
30 means for throwing each of said pinions out of operative relation with respect to the others.

4. In a building-block-making machine, the combination with a supporting-framework, of mold-carrying pieces supported thereby, a  
35 plurality of adjusting-bars pivotally engaging said pieces, and means for independently actuating said bars.

5. In a building-block-making machine, the combination with a supporting-framework, of  
40 mold-carrying pieces supported thereby, a plurality of rack-bars pivotally engaging each of said pieces, pinions meshing with said bars, means for actuating said pinions synchronously, and means for throwing each of said  
45 pinions out of operative relation with respect to the others.

6. In a building-block-making machine, the combination with a supporting-frame, of mold-engaging pieces supported thereby, a casing  
50 surrounding said mold-engaging pieces and extending through said casing, a rotatably-mounted shaft arranged on each side of said casing, a similar shaft at each end thereof, gearing connecting all of said shafts for effecting synchronous movement thereof, pinions  
55 carried by said shafts and meshing with said rack-bars, and a clutch member for each of said pinions for throwing the same into and out of operative relation with respect to  
60 its shafts.

7. In a building-block-making machine, the combination with a supporting-framework, of a mold carried thereby, a frame surrounding said mold, rack-teeth formed on said frame, a  
65 pinion carried by said frame meshing with said

teeth, means for actuating said pinion for moving said frame and mold, and means for removing the formed block from within said mold.

8. In a building-block-making machine, the  
70 combination with a frame, of a mold carried thereby, sets of vertically-movable fingers spaced apart, means for moving the same vertically, and means for moving the mold to a position with its contained block in the plane  
75 of said fingers.

9. In a building-block-making machine, the combination with a framework formed with a slot in each side of said frame, a guiding-block within each of said slots, a finger projecting  
80 from each of said blocks, the fingers carried by one block being spaced from the fingers carried by the other block, means for moving said blocks, and means for forming and delivering a building-block into contact with said fingers  
85 when at one extreme of their movement.

10. In a building-block-making machine, the combination with a frame, of a plurality of slots in each of its sides, a guiding-block in one of the slots of each side, a bar connected  
90 with each of said blocks, a plurality of fingers carried by said bar projecting through the other of said slots of the respective side, means for moving each of said blocks longitudinally of the respective slot, and means for  
95 forming and delivering a building-block into contact with said fingers when at one extreme of their movement.

11. In a building-block-making machine, the combination with a framework formed with a  
100 slot in each of its sides, a guiding-block movably mounted in each of said slots, building-block-engaging means carried by each of said guiding-blocks, a link pivotally connected to each of said guiding-blocks, a pivotally-mounted  
105 lever engaging each of said links, means for actuating each of said levers for moving said blocks, and means for forming and delivering a building-block into contact with said building-block-engaging means.

12. In a building-block-making machine, the combination with a framework and means for forming a building-block, of means for lowering  
110 the formed block out of the forming means, a lever for actuating said lowering means, a segmental rack carried by said lever, a pinion meshing with said rack, and means for actuating said pinion.

13. In a molding-machine, the combination with adjustable mold side pieces, of rack-bars  
120 for retaining said side pieces in position, and means for actuating said rack-bars, each of the rack-bars comprising a plurality of strips of material, and means for locking said strips of material together at various points intermediate their length for facilitating alteration  
125 in the length of said strips.

14. In a molding-machine, the combination with movably-mounted mold-supports, of rack-bars engaging the same, and means for actuat-  
130



ing said rack-bars, each of said rack-bars comprising a plurality of slotted strips of material, a bolt extending through said slots, a nut carried by said bolt for locking said strips together, and means for facilitating manual operation of said nut.

15. In a molding-machine, the combination with movable mold-supports, of rack-bars connected therewith, and means for adjusting the length of said rack-bars.

16. In a molding-machine, the combination with mold-plates, of a link engaging each of said mold-plates, a second link pivotally connected with the first-mentioned link, means pivotally supporting the free end of the second-mentioned link, a fixed support for the pivotal engagement between said links, and means for elevating the links from said support.

17. In a molding-machine, the combination with a casing and mold-plates therein, of a link extending through said casing and pivotally engaging each of said plates, a link pivotally connected with the first-mentioned link, means pivotally supporting the free end of said second-mentioned link, a lever pivoted to said casing near each of said sets of links, and a link pivoted to said lever and pivotally engaging the last-mentioned link.

18. In a molding-machine, the combination with a frame and a mold carried thereby, of vertically-movable, telescopic fingers, means for moving said fingers vertically, and means for moving the mold to a position with its contained block in the plane of said fingers.

19. In a molding-machine, the combination with a frame and a mold carried thereby, of vertically-moving fingers carried by said frame, and extensible members carried by said fingers.

20. In a building-block-making machine, the combination with a mold having a movable side, a shaft extending parallel to said side, means for rotating said shaft, means for imparting movement from the shaft to the side, and means for disconnecting the movement-imparting means for permitting free rotation of the shaft.

21. In a mechanism of the class described, the combination with a mold having a movable side, of a rotatably-mounted shaft extending parallel to said movable side, pinions on said shaft, racks connected with said side and engaging said pinions, and means for throwing said pinions into and out of operative relation to said shaft.

22. In a mechanism of the class described, the combination with a mold having a movable side, of a rotatably-mounted shaft, pinions carried thereby, racks pivotally connected to said movable side and engaging said pinions, and means for throwing said pinions into and out of operative relation to said shaft.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

WILLIAM J. STERLING.

Witnesses:

A. S. J. GAMMON,  
J. LLOYD GORDON.