

No. 786,251.

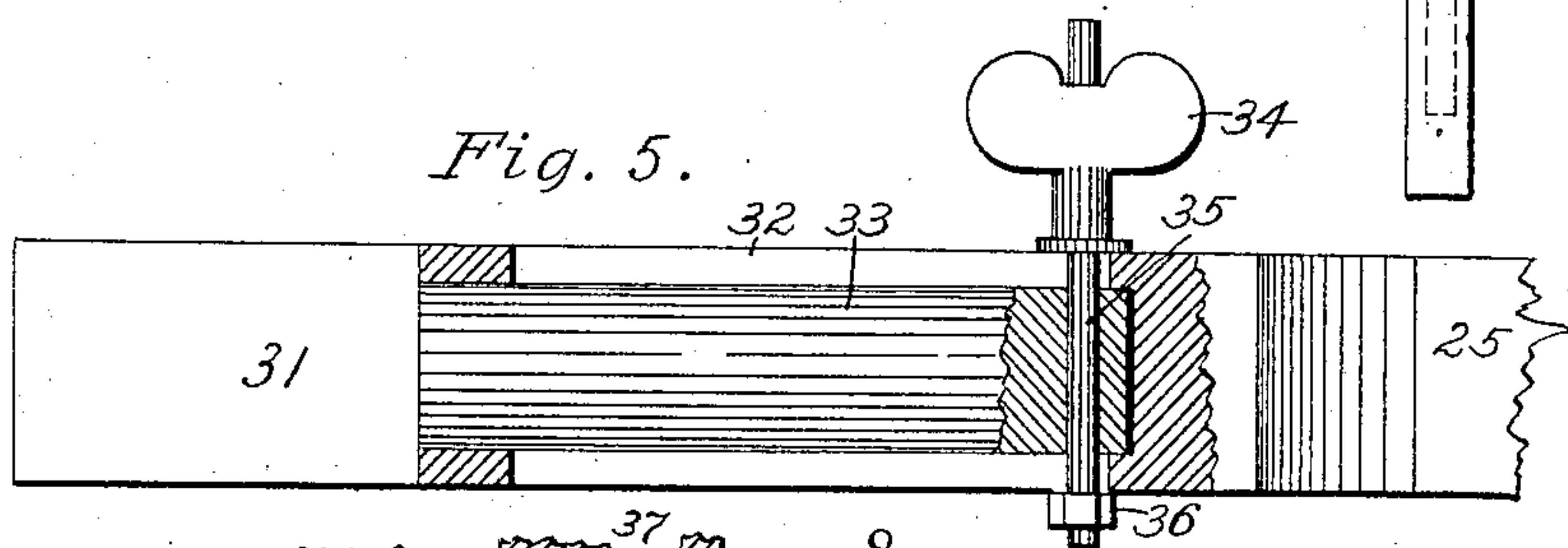
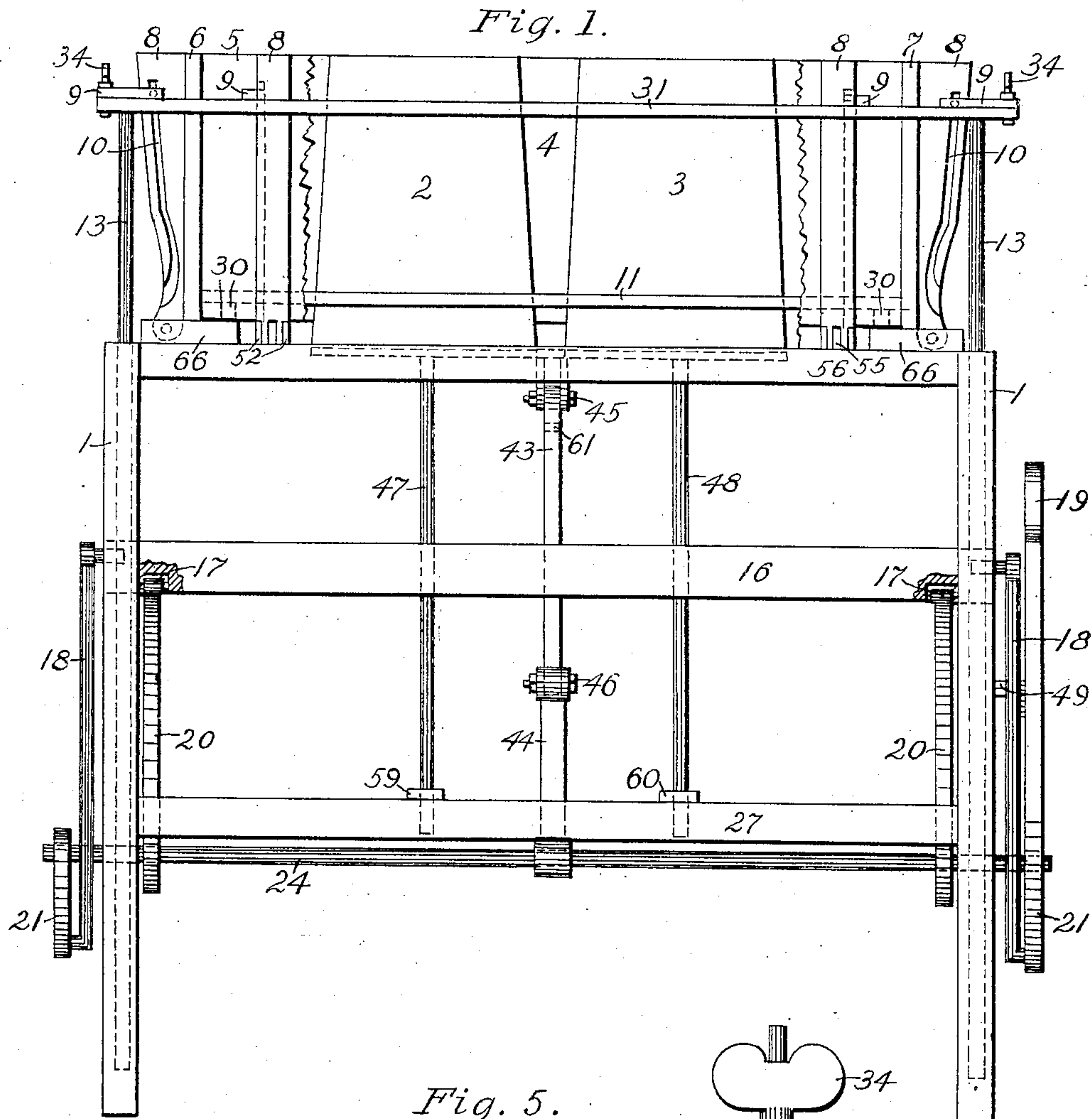
PATENTED MAR. 28, 1905.

J. F. DUNHAM.

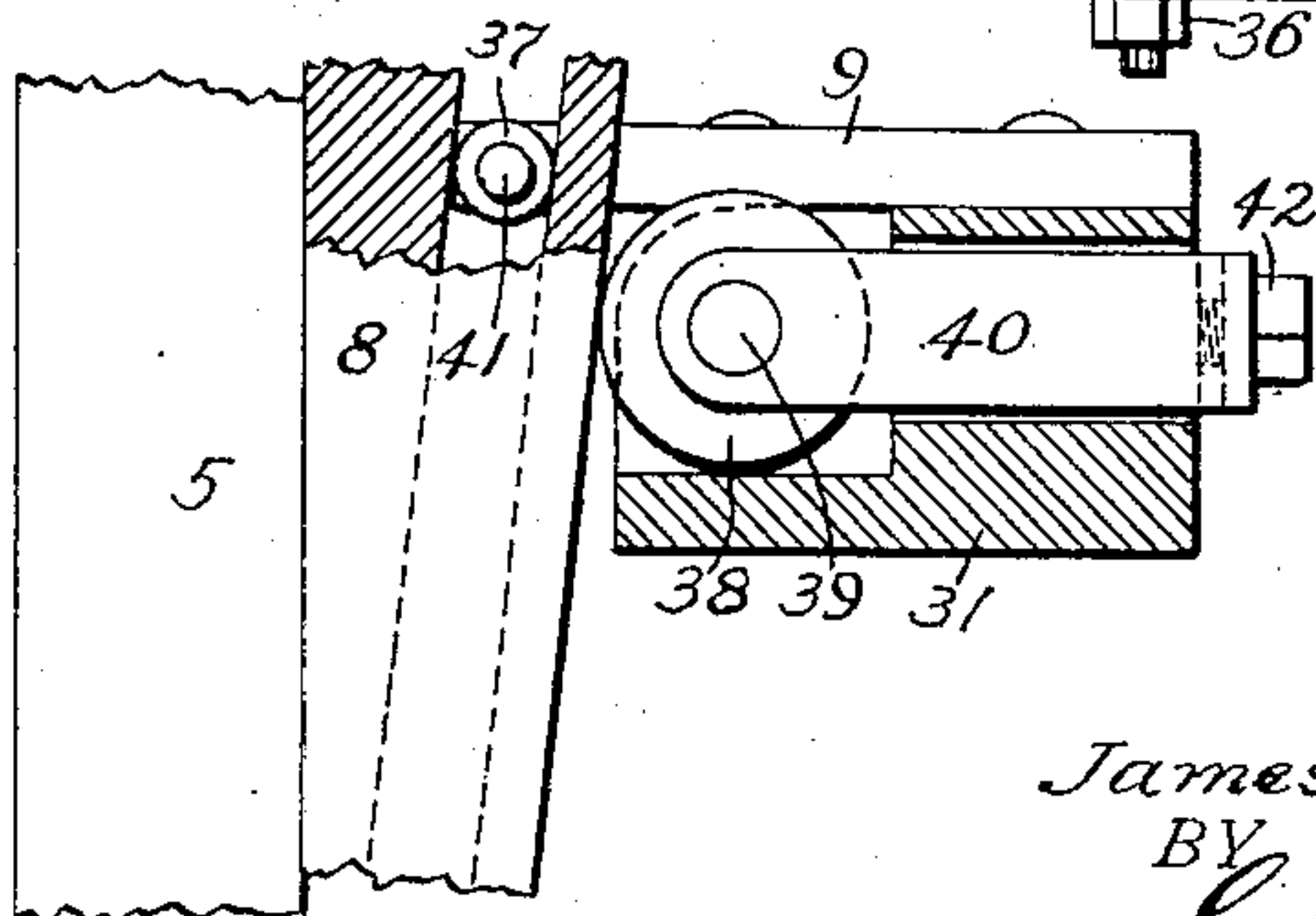
MACHINE FOR FORMING CONCRETE BUILDING BLOCKS.

APPLICATION FILED OCT. 6, 1904.

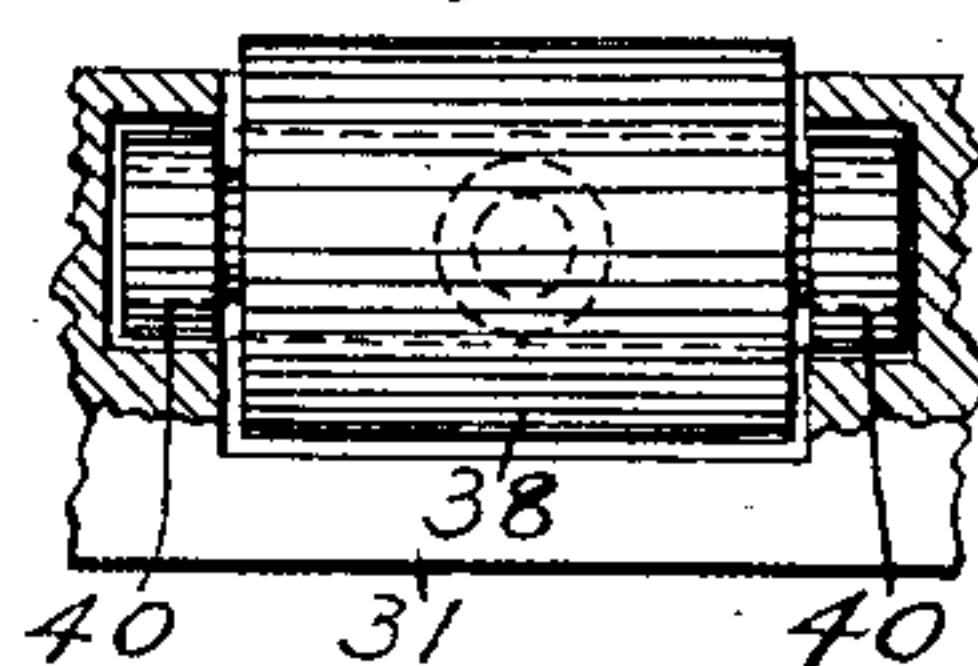
2 SHEETS—SHEET 1.



*Fig. 6.*



*Fig. 7.*



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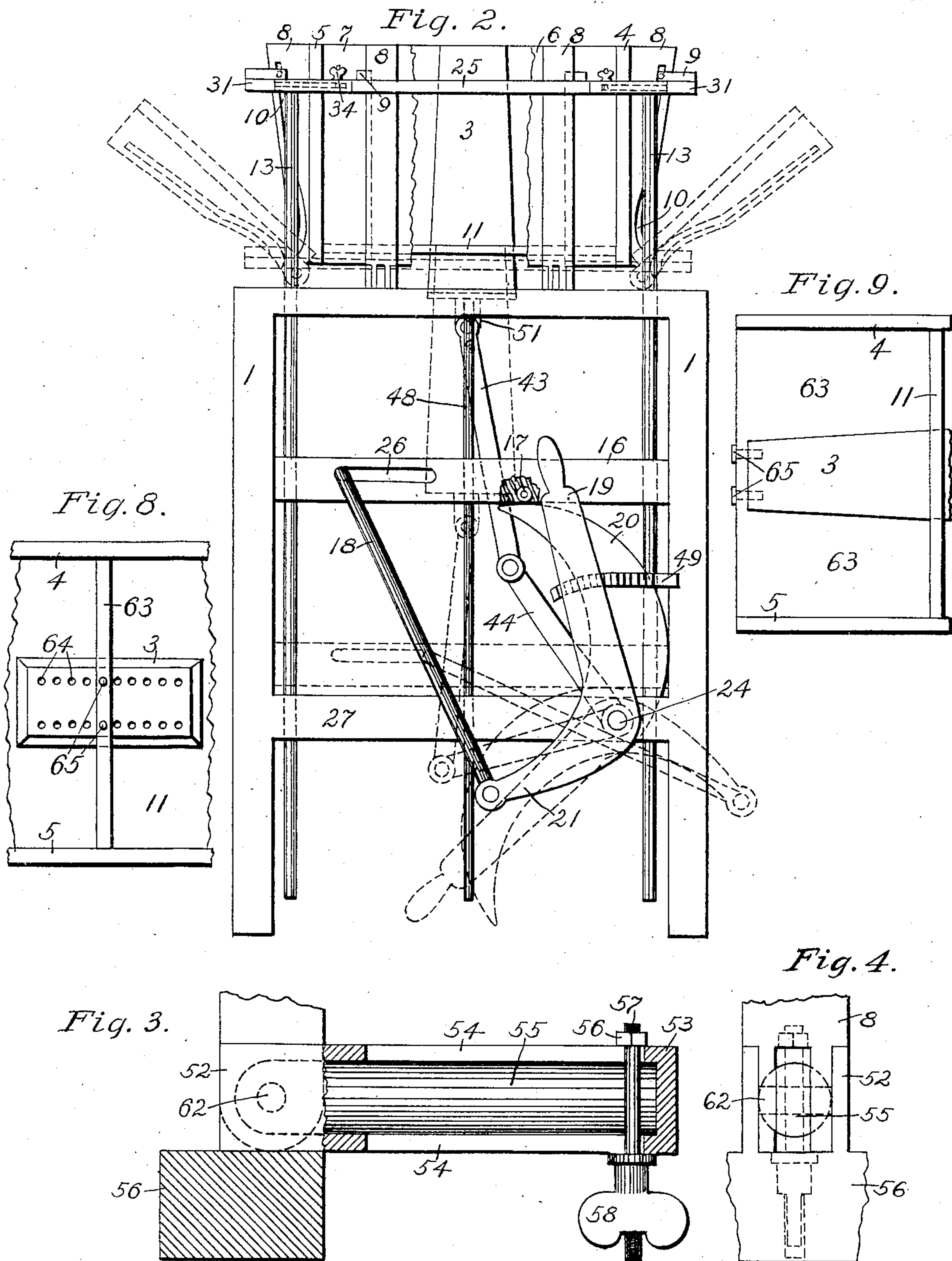
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# UNITED STATES PATENT OFFICE.

JAMES F. DUNHAM, OF WATERLOO, IOWA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO WATERLOO CONCRETE BRICK & BLOCK MACHINE COMPANY, OF WATERLOO, IOWA.

## MACHINE FOR FORMING CONCRETE BUILDING-BLOCKS.

SPECIFICATION forming part of Letters Patent No. 786,251, dated March 28, 1905.

Application filed October 6, 1904. Serial No. 227,395.

*To all whom it may concern:*

Be it known that I, JAMES F. DUNHAM, a citizen of the United States of America, and a resident of Waterloo, Blackhawk county, Iowa, have invented certain new and useful Improvements in Machines for Forming Concrete Building-Blocks, of which the following is a specification.

My invention relates to improvements in machines for forming concrete building-blocks; and the objects of my invention are to improve the construction of the machine which is shown and described in my application, Serial No. 217,454, filed July 21, 1904, as follows, viz: first, by devising a division contrivance for separating the mold into two parts, with suitable means for attaching such contrivance to the core-body; second, by rendering the mold adjustable for different widths of blocks by providing adjusting means for the mold drop sides and for the closing rack; third, by adopting antifriction-rollers which are adjustable to take up wear between the edges of the closing rack and the uprights on the mold sides and ends, and, fourth, by improving the means for vertically reciprocating the cores and by arranging for the dropping of said cores sufficiently to permit of the attachment of said division contrivance thereto. These objects I have attained by the mechanism which is hereinafter described and claimed and which is illustrated in the drawings hereto annexed, in which—

Figure 1 is a side elevation of my said improved machine. Fig. 2 is an end elevation of the same. Fig. 3 is a detail view showing the means for adjusting the side plates of the mold for different widths of blocks. Fig. 4 is a front elevation of the same. Fig. 5 is a detail view showing the means used for adjusting the width of the closing rack. Fig. 6 is a detail view showing the manner of placing the adjustable antifriction-roller between the closing rack and the bearing-surface of an upright on the mold. Fig. 7 is an elevation of the antifriction-roller. Fig. 8 is

a partial plan view of the mold, showing the division contrivance attached to one of the cores; and Fig. 9 is a side elevation of the same, parts of some of the figures being shown sectioned away in order to better disclose the interior construction.

Similar numbers refer to similar parts throughout the several views.

The actuating parts of my improved machine are mounted upon and within a machine-frame made up principally of the uprights 1 and cross-bars 27 and 56.

The mold consists of a removable bed-plate 11, resting on lugs 30, which latter are attached to the brackets 66 of the pivoted drop sides 4 and 5 and of the pivoted drop-ends 6 and 7. The cores 2 and 3, which are arranged to be reciprocated vertically, are projected upward into the interior of the mold through openings in the bed-plate 11. These cores are connected at the base, and their base-plate is provided with the downward-projecting bearings 51, also with the guide-rods 47 and 48, the latter vertically movable through the bearings in the brackets 59 and 60, attached to the side bar 27 of the machine-frame. The upper end of the connecting-rod 43 may be pivoted on a bolt 45, adjustably set in one of the two bolt-holes therein, the lower bolt-hole 61 only being used when the cores are lowered for the purpose of attachment to the division contrivance 63, said bolt 45 also being set in the bearings 51. The lower end of the connecting-rod 43 is pivoted to the outer end of the crank-arm 44, the latter being keyed to the shaft 24. The shaft 24, which is mounted in bearings in the machine-frame, is rotated by means of a hand-lever 19. The hand-lever 19 may be retained in a desired position by contacting with the ratchet-bar 49. The lever 19 is made in the form of a bell-crank, with the end of its short arm 21 pivoted to the lower end of the connecting-rod 18, the upper end of said rod having a stud which works horizontally within the slot 26 in the vertically-movable frame 16. Each end of the shaft 24



is connected in the same manner by means of crank and connecting-rod with the frame 16. The cam-sectors 20 are keyed to each extremity of the shaft 24 within the machine-frame, and their outer curved edges contact with the antifriction-rollers 17, mounted in the vertically-movable frame 16. Uprights 13 are carried by the frame 16 and are vertically movable within bearings in the machine frame. These uprights 13 are connected at the top by the end bars 25 of the closing rack. The side bars 31 of said closing rack are connected to the end bars 25 by means of the telescopic joint shown in Fig. 5. At the ends the end bars 25 are outwardly widened, as shown, and the widened portions are perforated to admit the studs 33 on the inner sides of the extremities of the side bars 31. The studs 33 are perforated to receive a bolt 35, and the inclosing shells are provided with longitudinal slots 32, within which the bolts 35 may be adjusted. Each bolt 35 has at one end a nut 36 and at the other end a set-screw with a thumb-piece 34, which bears against the upper flat surface of the bar 25. The width of the closing rack may be adjusted as desired by means of the use of this telescopic joint. In order to render the mold-body equally adjustable in width, I have also provided it with the telescopic joints shown in Figs. 3 and 4. This joint consists of a bracketed sleeve 53, attached to the machine-frame by means of uprights 52 on the cross-bar 56. The lower end of the mold side upright 8 is pivoted on a short headless bolt 62 in the outer end of the pin 55. The construction of the adjustable joint is the same as that used on the closing rack, the sleeve 53 being provided with slots 54, within which may work the bolt 57, the latter being set in a perforation in the end of the pin 55 and being furnished with a nut 56 and a thumb-screw 58.

To obviate friction between the closing rack and the uprights 8, I have placed antifriction-rollers 38 in the adjustable bearings 40 in the side bars 31. The adjustment of said rollers to take up wear is made by means of the adjusting-screws 42. The blocks 9, which are attached to the upper surfaces of the side bars 31, have pins 41 carrying the antifriction-rollers 37, the latter working within the slots 10 in the sides of the uprights 8.

In order to furnish means for the proper forming of blocks of less than the full length, I have provided a division contrivance 63, which is shown in detail in Figs. 8 and 9. The division-plate 63 is shaped to fit the spaces within the mold between the core and the mold sides. It is attached to the top of the core by means of plugs 65 set into sockets 64. Adjustment may be had by the use of different sets of sockets in the series shown. To provide for this attachment, the core-

bodies may be lowered a short distance by pivoting the bolt 45 in the lower bolt-hole 61 of the connecting-rod 43.

In operation the whole machine is actuated by a single partial rotation of the shaft 24. The closing rack may thus be either raised or lowered, while the cores are vertically reciprocated, the latter moving at a slightly greater speed over a somewhat greater distance of travel. This is due to the greater radius of the crank 44. The cores are kept in good alinement by means of the guide-rods 59 and 60.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A machine for forming concrete building-blocks, consisting of a mold having pivoted drop sides and ends, means for adjusting the width apart of said drop sides, a removable bed-plate, cores, means for reciprocating said cores, and an adjustable closing rack, surrounding said mold provided with means for being reciprocated in synchronism with said cores, substantially as described.

2. A machine for forming concrete building-blocks, consisting of a mold having pivoted drop sides and ends, means for adjusting the width apart of said drop sides, a removable bed-plate, an adjustable frame containing antifriction-rollers adapted to contact with the said pivoted drop sides and ends, and means for reciprocating said frame, substantially as shown and described.

3. A machine for forming concrete building-blocks, consisting of a mold having pivoted drop sides and ends, means for adjusting the width apart of said drop sides, a removable bed-plate, a frame surrounding said mold containing antifriction-rollers adapted to contact with the said pivoted drop sides and ends, a machine-frame, a shaft mounted therein, and means whereby said closing racks may be vertically reciprocated on a partial rotation of said shaft, substantially as shown and described.

4. A machine for forming concrete building-blocks, consisting of a mold having pivoted drop sides and ends, means for adjusting the width apart of said drop sides, a removable bed-plate, a frame surrounding said mold containing antifriction-rollers adapted to contact with the said pivoted drop sides and ends, a machine-frame, a shaft mounted therein, upright supports for said frame, cross-bars containing antifriction-rollers attached to said upright supports, and cams on said shaft adapted to contact with the rollers in said cross-bars, substantially as shown and described.

5. A machine for forming concrete building-blocks, consisting of a mold having pivoted sides and ends, means for adjusting the width apart of said drop sides, a removable



bed-plate, grooved ribs on said side and end plates, an adjustable closing rack surrounding said mold, roller-bearing studs carried on said closing rack and adapted to contact  
5 with the sides of the grooves in said ribs, and means for reciprocating said closing rack, substantially as shown and described.

6. A machine for forming concrete building-blocks, consisting of a mold having piv-  
10 oted sides and ends, means for adjusting the width apart of said drop sides, a removable bed-plate, grooved ribs on said side and end plates, an adjustable closing rack containing  
15 antifriction-rollers surrounding said mold, roller-bearing studs carried on said closing rack and adapted to contact with the sides of the grooves in said ribs, a machine-frame, a shaft mounted therein, and means whereby  
20 said closing rack may be vertically reciprocated on a partial rotation of said shaft, substantially as shown and described.

7. A machine for forming concrete building-blocks, consisting of a mold having piv-  
25 oted drop sides and ends, means for adjusting the width apart of said drop sides, a removable bed-plate, cores, means for reciprocating said cores, an adjustable closing rack containing antifriction-rollers surrounding  
30 said mold, studs on said closing rack adapted to contact with the inner surfaces of the grooves in the ribs on the drop ends and sides, grooved ribs on the drop sides and ends, and means for reciprocating said closing  
35 rack in synchronism with said cores, substantially as shown and described.

8. A machine for forming concrete building-blocks, consisting of a machine-frame, a mold having drop sides and ends pivoted in  
40 said machine-frame, means for adjusting the width of said mold, cores in said mold, a removable bed-plate in said mold perforated to receive said cores, means for adjustably locating said cores in said mold, an adjustable  
45 closing rack surrounding said mold and contacting with its outer surface, means for reciprocating said closing rack and said cores in synchronism, and a division-plate for said mold having means of attachment to one of  
50 the cores thereof, substantially as shown and described.

9. A machine for forming concrete building-blocks, consisting of a machine-frame, a mold having drop sides and ends, means for  
adjusting the width of said mold, cores in said mold, a division-plate, means for adjust- 55 ably connecting said division-plate to one of said cores, a removable bed-plate perforated for the reception of said cores, means for adjustably locating said cores in said mold, means for vertically reciprocating said cores, 60 a closing rack provided with suitable adjustments for varying its width, grooved ribs on said side and end plates, studs connected to said closing rack adapted to enter the grooves on said ribs and actuate said side and  
65 end plates, antifriction-rollers in said closing rack, a shaft mounted in said machine-frame, and means whereby said closing rack may be reciprocated in synchronism with said cores on a partial rotation of said shaft, 70 substantially as shown and described.

10. A machine for forming concrete building-blocks, consisting of a machine-frame, a mold having drop sides and ends, means for  
adjusting the width of said mold, cores, a 75 perforated bed-plate, a shaft mounted in said machine-frame, a crank on said shaft, a connecting-rod between said crank and said cores, guide-rods for said cores slidable in bearings on said frame, a closing rack pro- 80 vided with suitable adjustable connections for varying its width, antifriction-rollers adjustably mounted in said closing rack, grooved ribs on said side and end plates, studs on said closing rack adapted to con- 85 tact with the grooves in said ribs, uprights for said closing rack mounted in cross-bars and vertically movable in said machine-frame, slotted cross-bars carrying antifric- 90 tion-rollers, cam-sectors on said shaft adapted to contact with and actuate the cross-bars, bell-cranks on said shaft, and connecting-rods between said cranks and said cross-bars, substantially as shown and described.

Signed at Waterloo, Iowa, this 24th day 95 of September, 1904.

JAMES F. DUNHAM.

Witnesses:

M. E. KENNEDY,  
G. C. KENNEDY.