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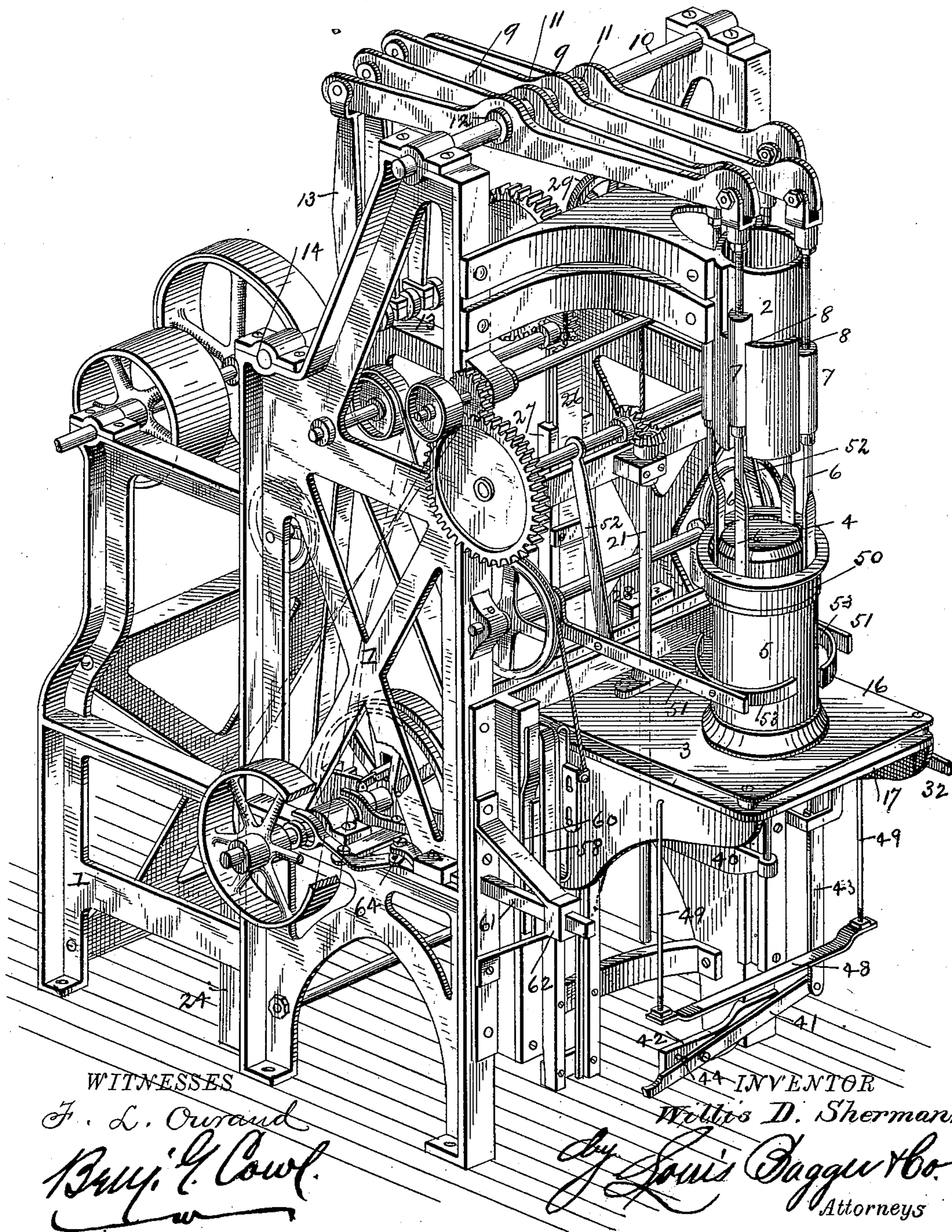
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W. D. SHERMAN.  
TILE MACHINE.

No. 405,183.

Patented June 11, 1889.

Fig. 1.



WITNESSES

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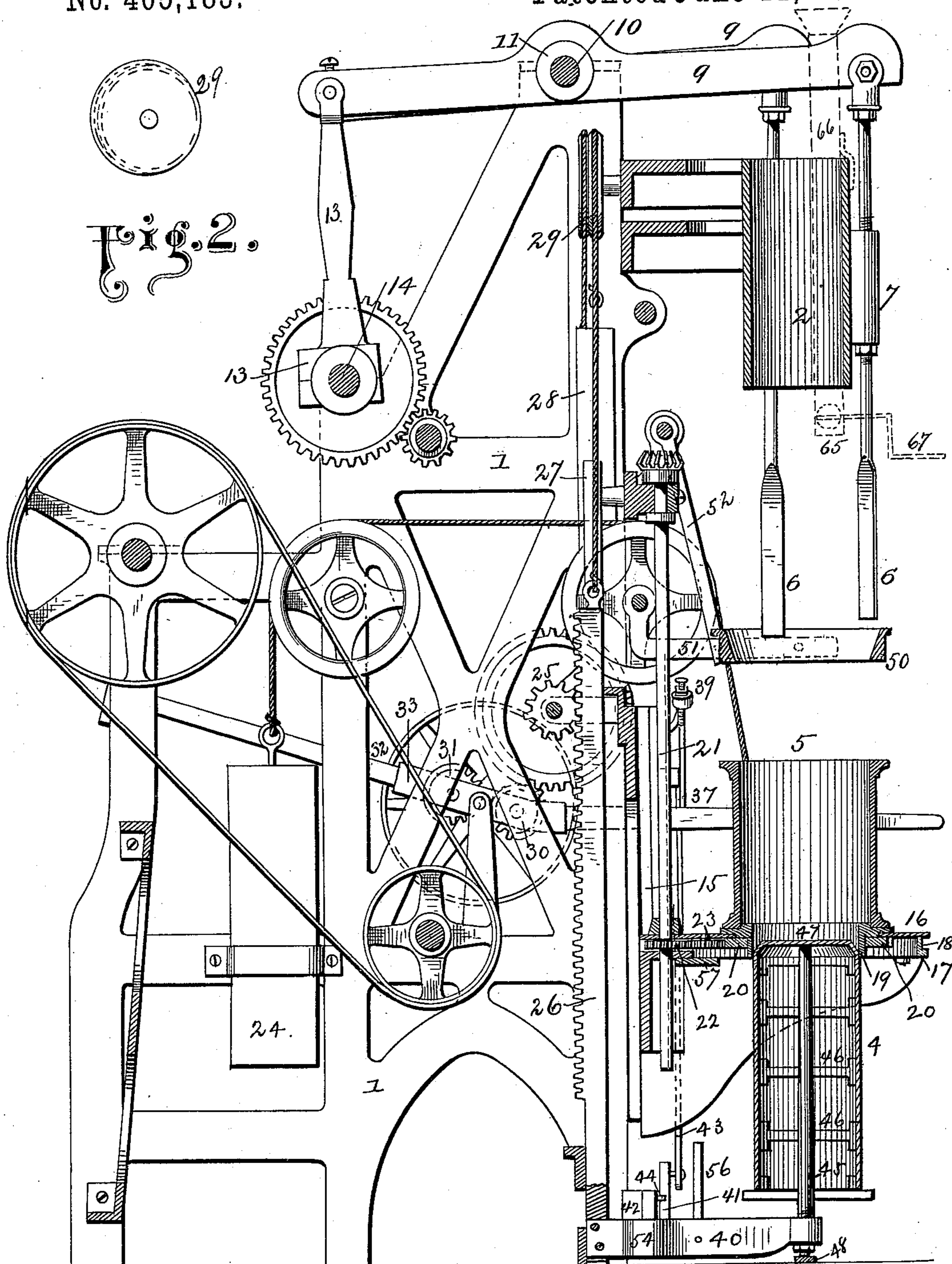
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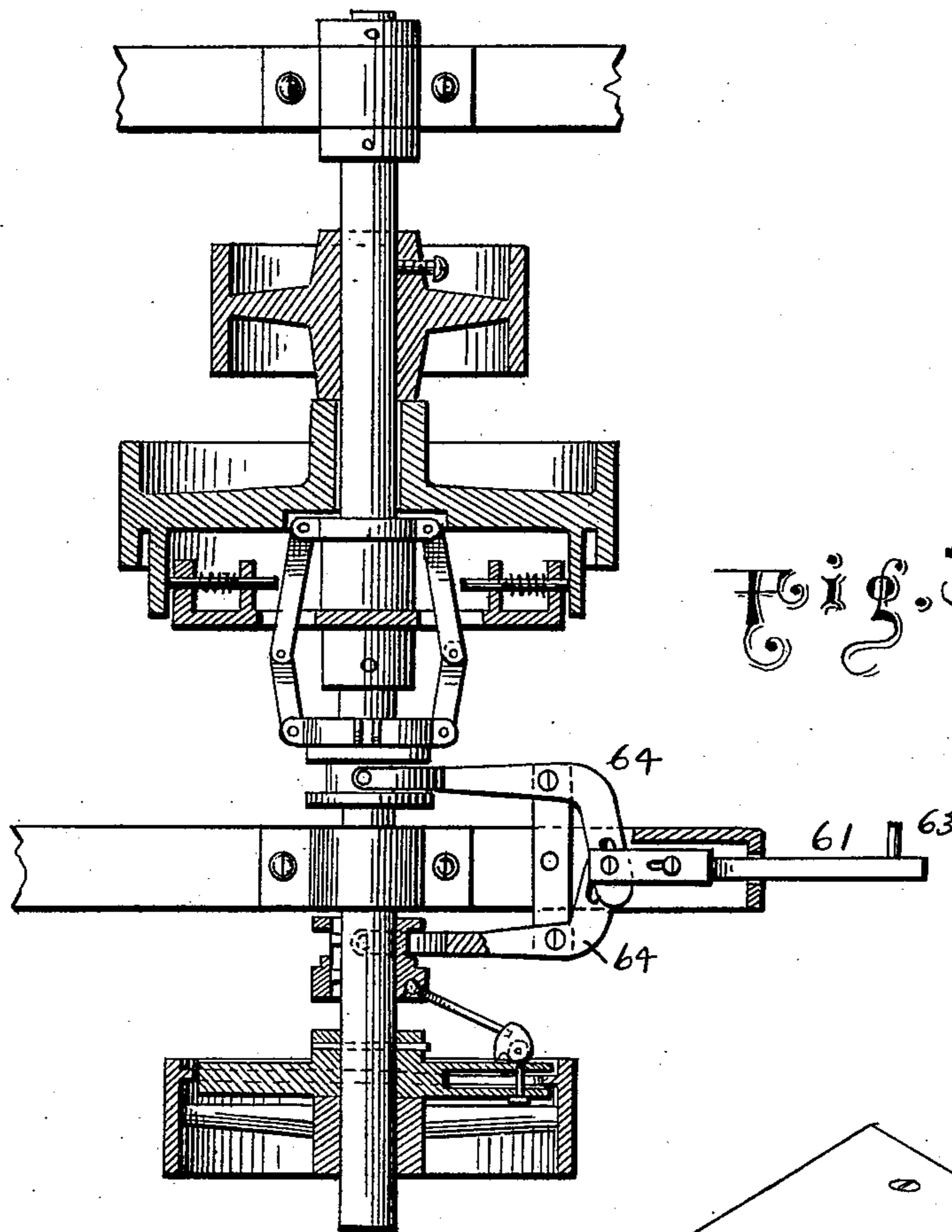


Fig. 3.

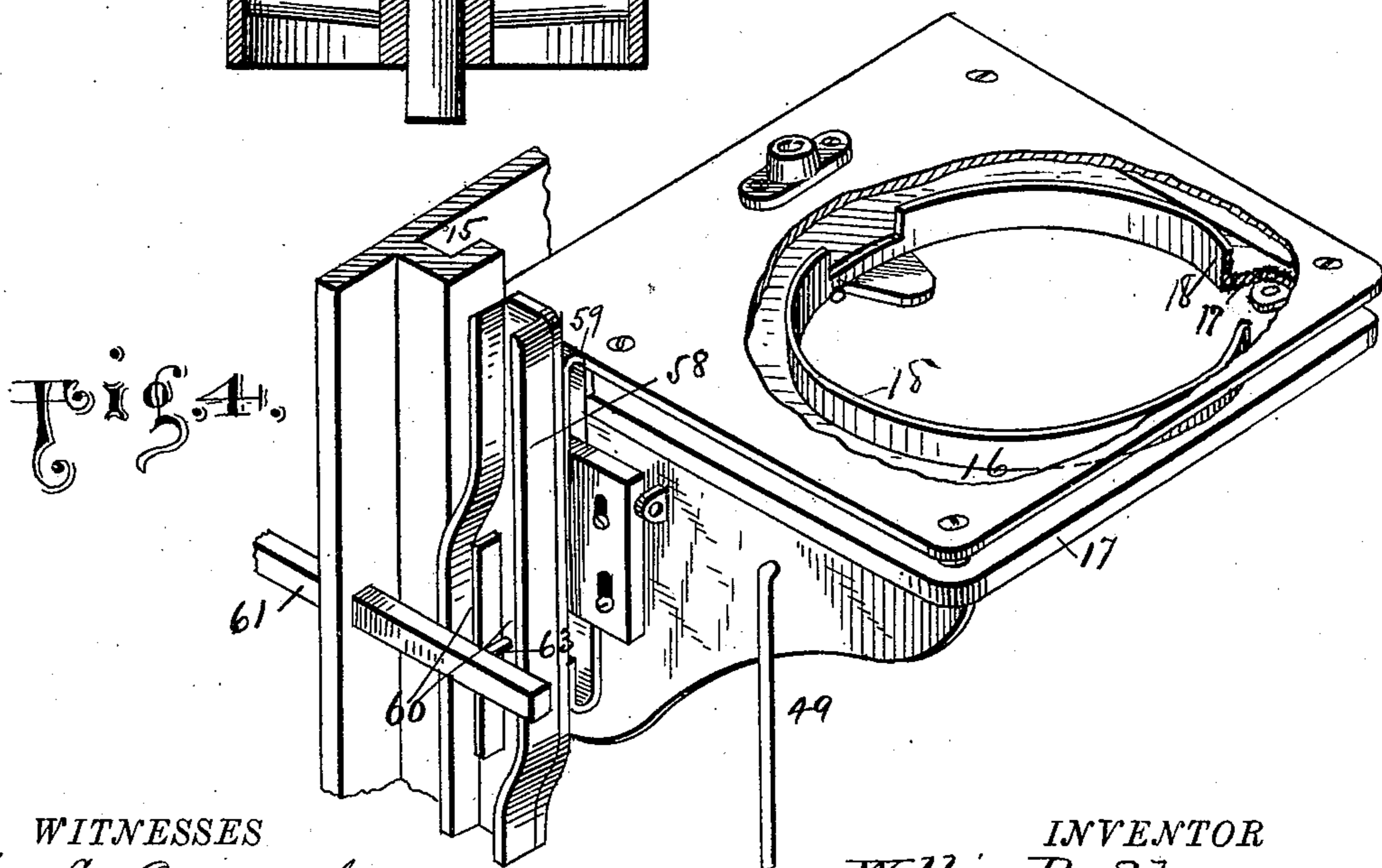


Fig. 4.

WITNESSES  
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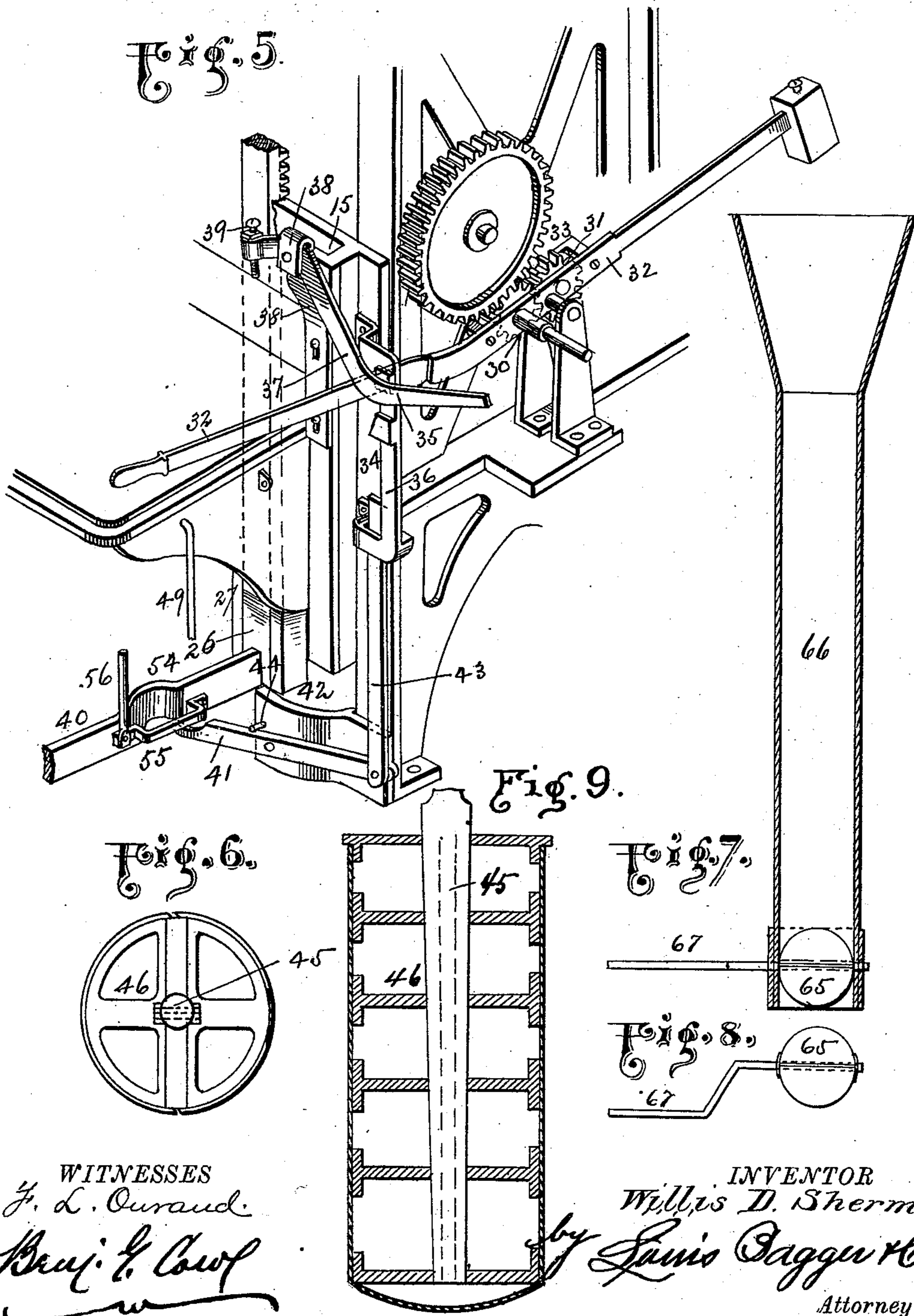
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4 Sheets—Sheet 4.

W. D. SHERMAN.  
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No. 405,183.

Patented June 11, 1889.



# UNITED STATES PATENT OFFICE.

WILLIS D. SHERMAN, OF OMAHA, NEBRASKA, ASSIGNOR TO THE UNION  
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## TILE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 405,183, dated June 11, 1889.

Application filed March 8, 1888. Serial No. 206,553. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIS D. SHERMAN, a citizen of the United States, and a resident of Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Tile-Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a perspective view of my improved tile-machine with a portion of the driving mechanism shown only in dotted lines, or omitted entirely. Fig. 2 is a longitudinal vertical sectional view of the same. Fig. 3 is a plan view of the clutch for throwing the tilting mechanism into and out of gear. Fig. 4 is a perspective view of one side of the table and the means for operating the clutch. Fig. 5 is a perspective view of the opposite side of the table and the mechanism for moving it up and down. Fig. 6 is an end view of one style of gear that may be used with the machine, the core being contractible. Fig. 7 is a sectional view of the feed-chute. Fig. 8 is an end view of the same, and Fig. 9 is a vertical sectional view of the contractible core.

My invention relates to that class of tile-machines in which the tile is formed between a core and a revolving shell; and it consists in the improved construction and combinations of parts of the same, as will be hereinafter more particularly described, and pointed out in the claims.

Referring to the accompanying drawings, in which the same numerals indicate corresponding parts in all of the figures, 1 indicates the frame of the machine, which is preferably formed of cast metal and of such size as will best adapt it to the use for which it is intended. A cylinder or drum 2 is rigidly secured to the front of the frame near its top, and a vertically-moving table 3 is secured below the hopper. A core 4 projects up through the table, and a shell 5 is placed around the core, leaving a space between the two which

corresponds to the required thickness of the tile, which is formed in this space by means of the tamping-bars 6. These bars are secured at their upper ends to guides 7, which are moved up and down in the ways 8 in the sides of the cylinder or drum 2 by the walking beams or levers 9, which are loosely journaled or pivoted upon a rod or bearing 10 at the top of the frame, having the washers 11 between them and the collars 12 at their sides for retaining them in position. This construction permits of the free movement of the levers without their interfering with each other, and also permits of the easy removal of one or all of them for repair, &c. Motion is imparted to these levers by the pitmen 13 and the eccentrics upon the shaft 14, which in turn is operated from the main driving-shaft by suitable gears and pulleys.

The table 3 is secured to the frame by means of guide-blocks on its sides, which move in the guideways 15. The top of the table is composed of an upper and a lower plate 16 and 17, each having a large aperture at its middle, the lower plate 17 being flanged around the aperture, as shown at 18. The plate 17 is secured to the sides of the table in any convenient manner, that shown being preferred, and the plate 16 is secured to the plate 17 by means of the bolts or screws at the corners, as shown, which pass through blocks or washers of the same thickness as the flange upon the lower plate. An annular flanged table 19 is fitted in the aperture in the upper plate 16, having a projection at its top of the same diameter and thickness as the tile which is to be formed, so that the lower end of the shell will fit around the projection, and thus always be at an equal distance from the core at all points, different tables being used for different-sized tiles. A flanged rim 20, having cogs upon its outer edge, is secured to the lower portion of this revolving table 19, leaving a space between it and the flange of the table, in which the upper plate 16 is secured, thus keeping the table from getting out of its bearings.

A vertical shaft 21 is journaled at its upper end to the front of the frame, and has its lower end passed through the rear portion of the

table. A gear-wheel 22 between the upper and lower plate of the table is secured upon the lower end of this vertical shaft by means of a key which slides in a groove in the side of the shaft as the table is moved up and down. Motion is imparted to this shaft by suitable gearing, which in turn is communicated to the table 19 by means of the idle-wheel 23, which is journaled upon a stud on the under side of the top plate 16. The weight of the table is balanced by the two counterpoises 24, which are connected to the table by means of chains which pass over pulleys journaled to the sides of the frame.

The table is moved up and down by means of a cog-wheel or pinion 25 and the rack 26, which moves in the guides 27, secured upon the frame, as shown, and an arm secured to the lower end of the rack, as will be herein after more fully described. The rack is counterbalanced by a weight 28, which is connected with the rack by means of a chain which passes over a pulley 29, which is journaled near the top of the frame. The cog-wheel 25 is driven in either direction by engaging with either one or the other of two intermeshing wheels 30 and 31, which are journaled in bearings in a lever 32 and a plate 33 secured upon its side. This lever, which has an adjustable weight upon one end and a handle at the other end, is pivoted in bearings in a small frame at the side of the main frame, and the wheels 30 and 31 are driven by means of a pulley which receives its motion from the main driving-shaft. The handle end of the lever engages with catches 34 and 35 upon the inner edge of the plate or keeper 36 on the front of the machine.

A bent arm 37 is pivotally secured to the top of a plate 38, which is adjustably secured to the front of the frame, and is provided at its upper end with an adjusting-screw 39, which engages with the top of the table and causes the lower end of the arm to force the handle end of the lever 32 down over the lower catch 34, which is beveled on its inner face, and thus throw the wheels 30 and 25 out of engagement and stop the upward movement of the table. As the tile is being formed, the table 3 is gradually forced down by the tamping-bars acting upon the accumulation of material until the completion of the tile, when the end of the lever 32 is drawn down by hand to its lowest point, which throws the wheels 30 and 25 into engagement, and the rack is lowered sufficiently to withdraw the core from the tile. When the rack reaches its lowest position, an arm 40, which is secured to the lower end of the rack, strikes one end of a lever 41, which is pivoted to one end of a block 42, which is secured to the front of the machine. As this end of the lever is forced down by the downward movement of the rack, the opposite end is carried up, and with it a push-rod 43, the upper end of which passes through a hole in the lower end of the keeper 36 and engages with the

end of the lever 32. This causes the lever to be moved so as to throw the wheels 30 and 25 out of engagement, and thus stop the downward movement of the rack and table. A pin 44 in the block 42 prevents that end of the lever 41 from rising sufficiently to permit the upper end of the push-rod from coming out of the hole at the bottom of the keeper.

To permit of the easy removal of the core from the finished tile, it is made contractible, as shown. That construction in which the upper end of the support 45 is secured at its lower end to the outer end of the arm 40 is made tapering, and fits between the halves of a series of ribs 46, a piece of sheet-steel being secured to the halves upon one side and a similar piece of steel being secured to the halves upon the other side of the support 45, the edges of the pieces of steel being beveled so as to produce a close joint. The upper end of this core is preferably provided with a cap 47, which prevents the material of which the tile is formed from getting inside of the core. A cross-bar 48 is suspended from the table by means of the rods 49, so that after the tile has been completed and the core withdrawn the arm comes in engagement with the cross-bar and pulls the table down far enough to permit of the easy removal of the tile without interfering with the ends of the tamping-bars or with a funnel 50, which is supported at the ends of the arms 51. These arms are secured at their opposite ends upon a shaft across the front of the frame, and are kept in a horizontal position by means of the braces 52, which are secured at their upper ends to a shaft across the front of the frame and at their lower ends to the arms. A curved support or semicircular ring 53 is pivotally secured to the outer end of each of the arms 51, which allows the funnel to move or tilt sufficiently to prevent the ends of the tamping-bars from catching or binding within it and thus damaging the machine. To prevent the arm 40 from interfering with the vertical shaft as it is moved up, it is curved, as shown at 54, and a brace 55 is secured opposite the curved portion. A short rod or upright 56 is secured to the arm near this curved portion, the upper end of which engages with a plate 57 upon the under side of the table, and carries the table up into its position to commence forming the tile. The length of this rod and that of the rods 49 are so proportioned to each other and to the length of the support for the core that the upper end of the rod 56 does not come in contact with the bottom of the table until the core has been raised to its place within the shell, so that when the table reaches its highest point everything is in readiness to receive the material for making the tile; and when the tile has been formed the arm 40 does not come in contact with the cross-bar 48 until after the core has been entirely withdrawn, so that when the table has been lowered to its

lowest position and the rack stopped by the throwing of the intermeshing wheels out of engagement the shell and tile can be removed without danger of interfering with the core.

5 As the increasing weight of the tile would have a tendency to cause the table to descend with less and less pressure from the tamping-bars, thus making the upper end of the tile of a less density than the lower end, I prefer to  
10 make the pulley 29 double, as shown, having one part of it eccentric, so that as the weight of the tile increases the power of the counterpoise increases in like proportion, so that it takes the same force from the tamping-bars  
15 at all stages of the formation of the tile to force it down, thus producing a tile of uniform density throughout. This construction necessitates the use of two chains, the one from the rack being secured to the concentric  
20 part of the pulley and the one from the counterpoise being secured to the eccentric part, the pulley being provided with holes or other means for the securement of the chains.

As it is desirable to have the tamping-bars  
25 and the revolving table stationary, except when the tile is being formed, I have provided the machine with means for automatically throwing the mechanism for operating these parts out of gear. Upon one side of the table  
30 a cam-guide or runway 58 is adjustably secured by means of the slotted support 59. This guide has two channels 60 cut in its outer side, the end of each of the channels running into the other channel at opposite  
35 ends of the guide, thus forming cams. A rod or bar 61 is secured in bearings at one side of the frame of the machine and projects in front near the guide, the outer end of the bar being supported in the brace 62. A pin 63 upon  
40 the inner side of the bar engages with the channels of the guide, and as the table is moved up or down the bar is moved forward or back, as the case may be. The inner end of this bar is adjustably connected with the  
45 shorter arms of two L-shaped or right-angled clutch-levers 64. These clutch-levers are pivotally secured to the frame, and their outer ends operate any ordinary clutch mechanism, one of which controls the mechanism for op-  
50 erating the tamping-bars and the other one controls the mechanism for rotating the table. When the table is being raised to its highest point, the pin in the bar 61 slides down in the front channel until the table has nearly  
55 reached the end of its journey, when the channel runs into the rear channel, and the pin, with the bar, is forced back, thus throwing the clutch mechanisms into engagement and starting the tamping-bars and the revolving  
60 table. The damper 65 at the bottom of the hopper 66, the handle of which 67 projects between the tamping-bars, is then opened by the one in charge of the mill, and the material, as shown in dotted lines in Fig. 2, is  
65 gradually fed down through the funnel 50 into the shell, where it is tamped or compressed into a tile. As the table is thus gradually

forced down by the formation of the tile, the pin travels up in the rear channel until it arrives at the point where it runs into the front  
70 channel, which it does just as the tile is completed, when the pin and the bar are carried forward, which throws the clutch mechanisms out of engagement, and the operation of the machine is stopped. The operator then forces  
75 down the end of the lever 32, as described, which sets the mechanism in operation for withdrawing the core from the tile and lowering the table for the removal of the tile.

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

1. The combination, with the frame of a tile-machine, of a vertically-moving table, a rack for operating the table, a double sheave-  
85 wheel journaled at the inside of the frame, one part of which is concentric and the other part eccentric, a counterpoise, and chains secured to the top of the rack and to the counterpoise, substantially as described. 90

2. The combination, with the frame of a tile-machine, of a vertically-moving table, a cross-bar suspended from the table, a vertically-moving rack at the rear of the table, and  
95 an arm secured to the lower end of the rack, the outer end of which is adapted to engage with the cross-bar, substantially as described.

3. The combination, with the frame of a tile-machine, of a vertically-moving table, a rack at the rear of the table, an arm secured  
100 to the lower end of the rack, and an upright secured to the arm, the upper end of which is adapted to come in contact with a plate upon the under side of the table, substantially as described. 105

4. The combination, with the frame of a tile-machine, of a vertically-moving table having a bearing or hole at its rear portion, a vertical shaft journaled to the frame at its up-  
110 per end and passed through the hole in the table at its lower end, a rack at the rear of the table, an arm secured to the lower end of the rack having a bent or curved portion registering with the shaft, and a plate secured to the arm, substantially as described. 115

5. The combination, with the frame of a tile-machine, of a vertically-moving table, a cam-guide, a series of clutch-levers, and a bar connecting with the cam and clutch-levers,  
120 substantially as described.

6. The combination, with the frame of a tile-machine, of a vertically-moving table, a slotted support, a cam-guide on the support, a series of clutch-levers, and a bar connecting  
125 the cam-guide and clutch-levers, substantially as described.

7. The combination, with the frame of a tile-machine, of a vertically-moving table, a channeled cam-guide, a brace, a bar, and a pin on the bar for engaging the channels in  
130 the cam-guide, substantially as described.

8. The combination, with the frame of a tile-machine, of a vertically-moving table, a cam-guide, a series of clutch-levers pivotally

secured to the frame, and a bar connecting with the clutch-levers and cam-guide, substantially as described.

9. The combination, with the frame of a tile-machine, of a vertically-moving table, a bent arm adjustably secured to the front of the machine, and a lever pivotally secured to the side of the machine and adapted to be operated by the bent arm, substantially as described.

10. The combination, with the frame of a tile-machine, of a vertically-moving table, a bent arm pivotally secured to the front of the machine, a lever pivotally secured to the side of the frame and adapted to be operated by the bent arm, and a keeper secured to the frame having catches upon its inner edge, substantially as described.

11. The combination, with the frame of a tile-machine, of a vertically-moving table, a bent arm pivotally secured to the front of the frame, an adjusting-screw in the upper end of the arm, a lever pivotally secured to the side of the frame adapted to be operated by the arm, and a keeper secured to the frame having catches upon its inner edge, one of which is beveled, substantially as described.

12. The combination, with the frame of a tile-machine, of a vertically-moving table, a lever pivotally secured to the lower portion of the frame, a rack at the rear of the table, the lower end of which is provided with an arm, said arm being adapted to engage with the end of the lever, a keeper secured to the frame having a hole in its lower end, a push-rod secured to the other end of said lever, having its upper end within the hole in the keeper, and a lever pivotally secured to one side of the machine, having its end within the keeper and adapted to be operated by the end of the push-rod, substantially as described.

13. The combination, with the frame of a tile-machine, of a vertically-moving table, two forwardly-projecting arms above the table, braces secured thereto, a funnel at the ends of the arms, a shell upon the table, and tamping-bars projecting through the funnel, substantially as described.

14. The combination, with the frame of a tile-machine, of a vertically-moving table, two forwardly-projecting arms above the table, a semicircular ring pivotally secured at the end of each arm, a funnel upon said rings, a shell

upon the table, and tamping-bars projecting through the funnel, substantially as described.

15. The combination, with the frame of a tile-machine, of a vertically-moving table, a rack at the rear of the table, an arm at the lower end of the rack, an upright and a support secured to the arm, a core upon the support, a cross-bar suspended below the table, and a shell upon the table, said upright, support, and cross-bar being so arranged in relation to each other that the table is not moved upward until the core has been placed in position, nor downward by the rack until the core has been withdrawn, substantially as described.

16. The combination, with the frame of a tile-machine, of a vertically-moving table, a block secured to the lower portion of the front of the frame, a lever pivotally secured to said block, a pin in the block above the end of the lever, a rack at the rear of the table, an arm secured to the lower end of the rack adapted to engage with the end of the lever, a keeper secured to the frame having a hole in its lower end, a lever pivotally secured to the side of the machine having one end within the keeper, and a push-rod secured to the outer end of the lever at the bottom of the machine, the upper end of which passes through the hole in the bottom of the keeper and engages with the end of the lever secured to the side of the frame, substantially as described.

17. In a contractible core for tile-machines, the combination of a series of ribs cut in halves, a piece of sheet-steel secured to each of the sets of halves, the edges of which are beveled, a cap, and a tapering support adapted to be forced between the two sets of halves of the ribs, substantially as described.

18. In a tile-machine, the combination of a support, a face-plate secured to the lower portion of the support, a table the sides of which are provided with clips which engage with the plate, a core through the table, and tamping-bars above it.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

WILLIS D. SHERMAN.

Witnesses:

A. C. TROUP,  
JNO. BEDFORD.