

No. 825,614.

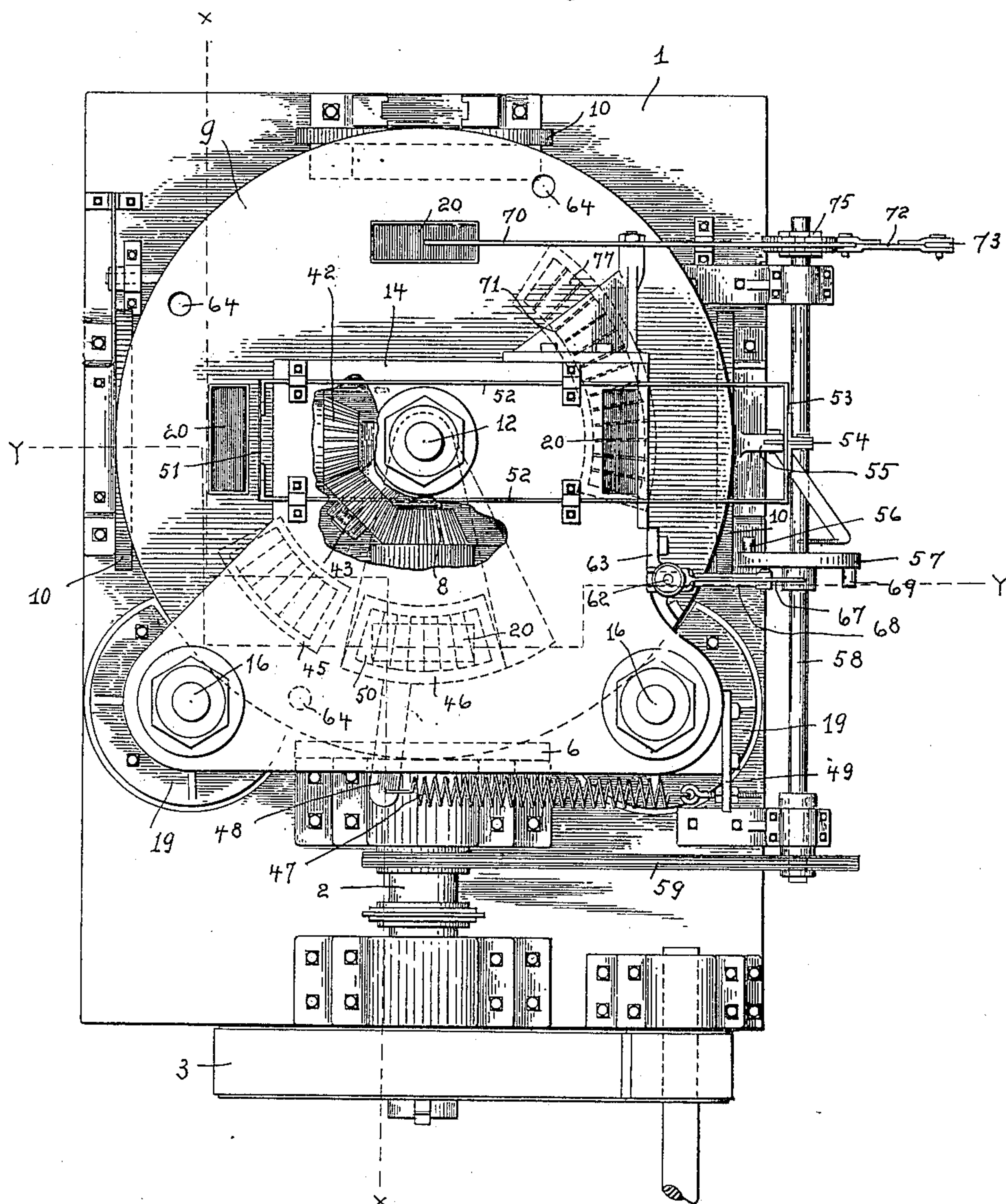
PATENTED JULY 10, 1906.

C. W. REYNOLDS.
BRICK PRESS.

APPLICATION FILED OCT. 17, 1903.

4 SHEETS—SHEET 1.

Fig. 1—



Witnesses—
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Chas. A. Carr.

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APPLICATION FILED OCT. 17, 1903.

4 SHEETS—SHEET 2.

Fig. 2 -

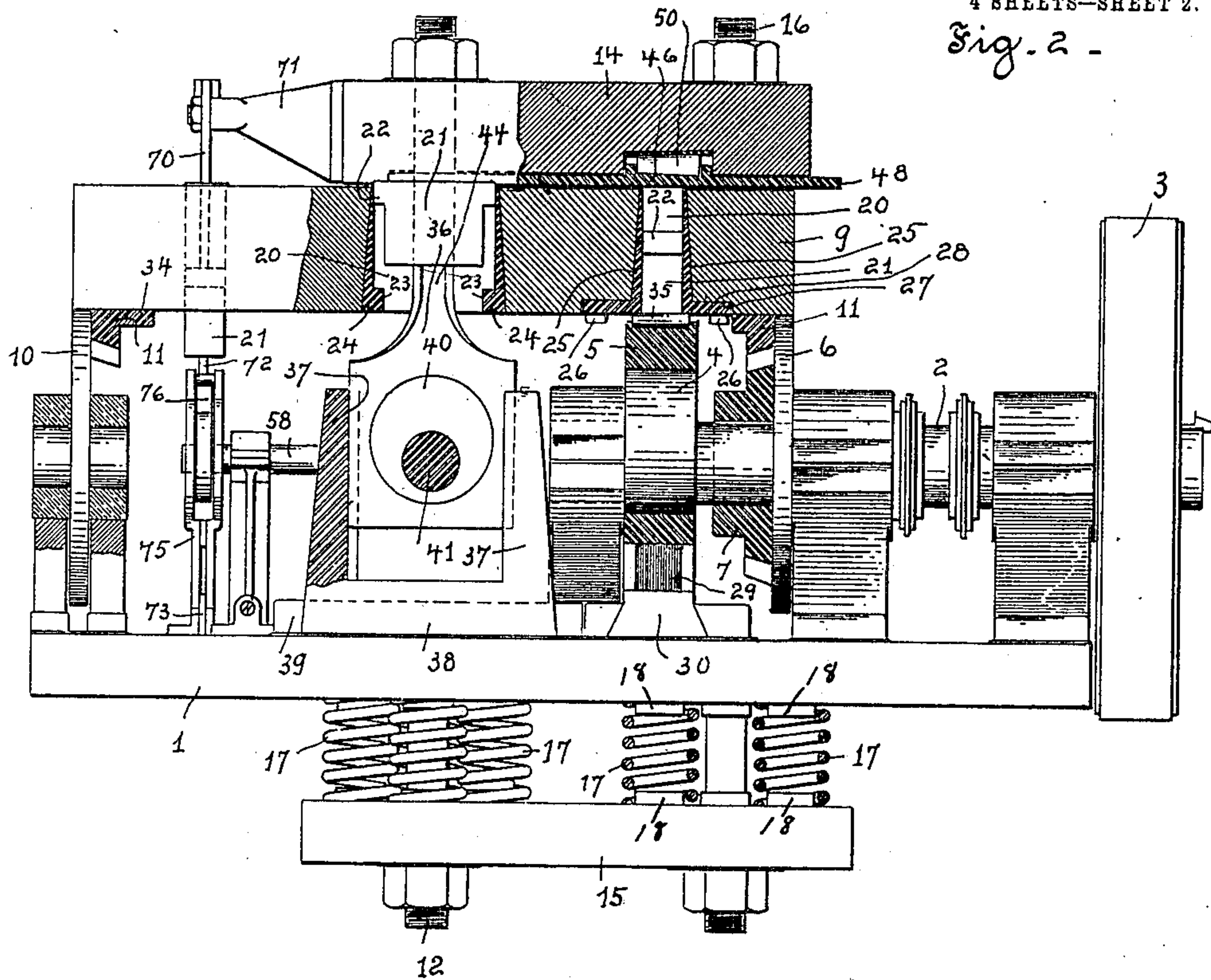
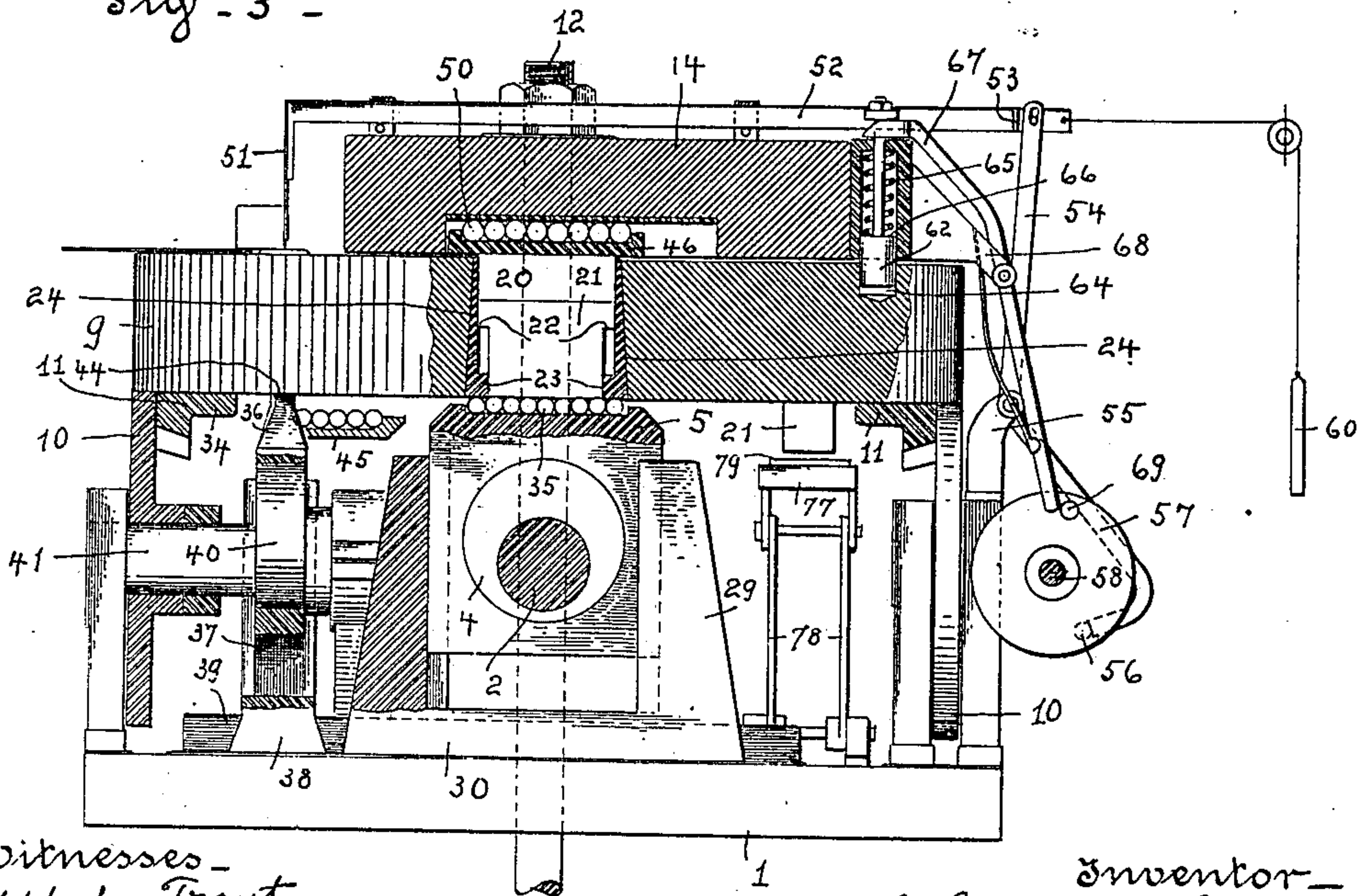


Fig. 3 -



witnesses -
M. L. Trout
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4 SHEETS—SHEET 3.

Fig. 4—

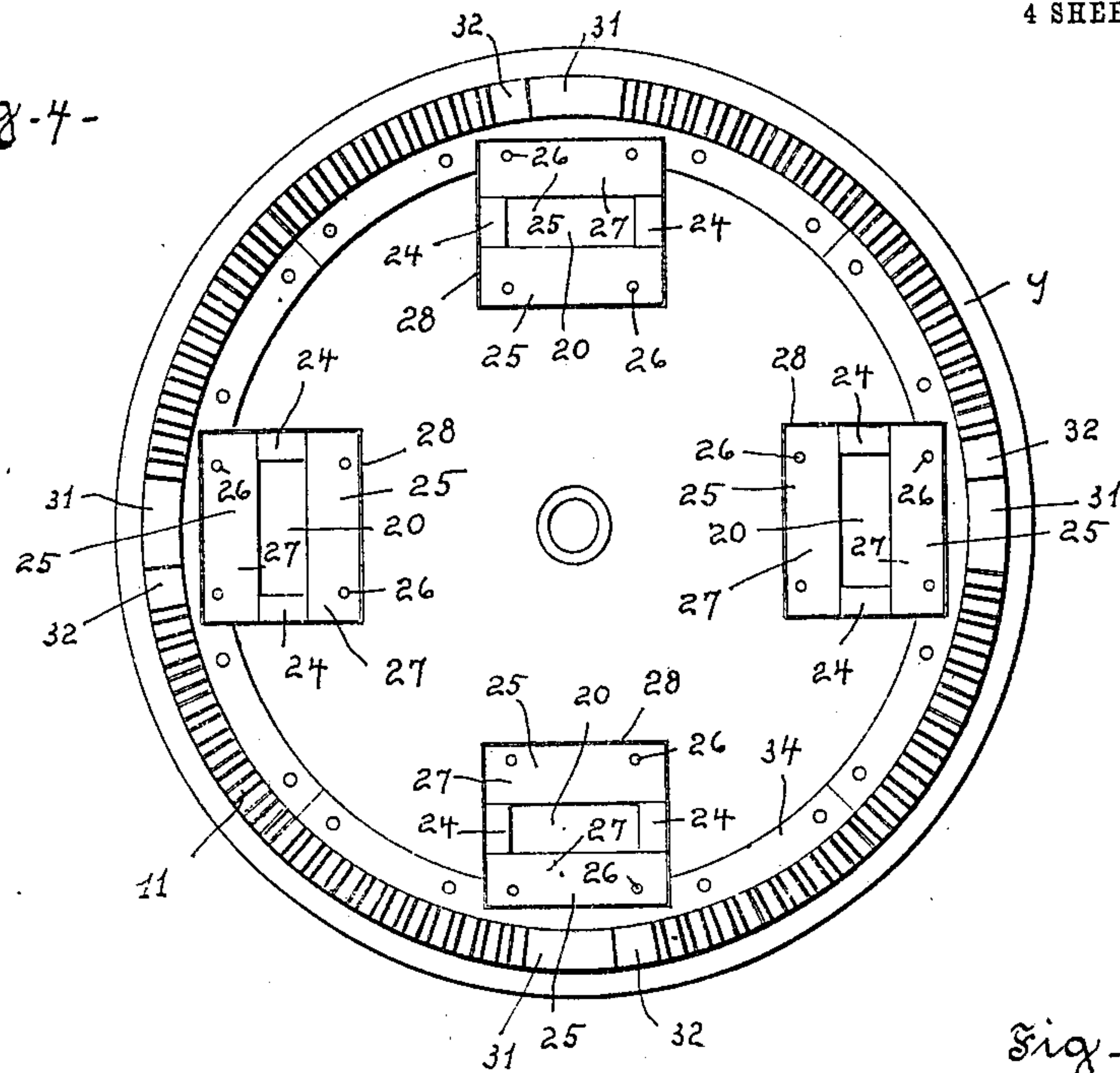


Fig. 5—

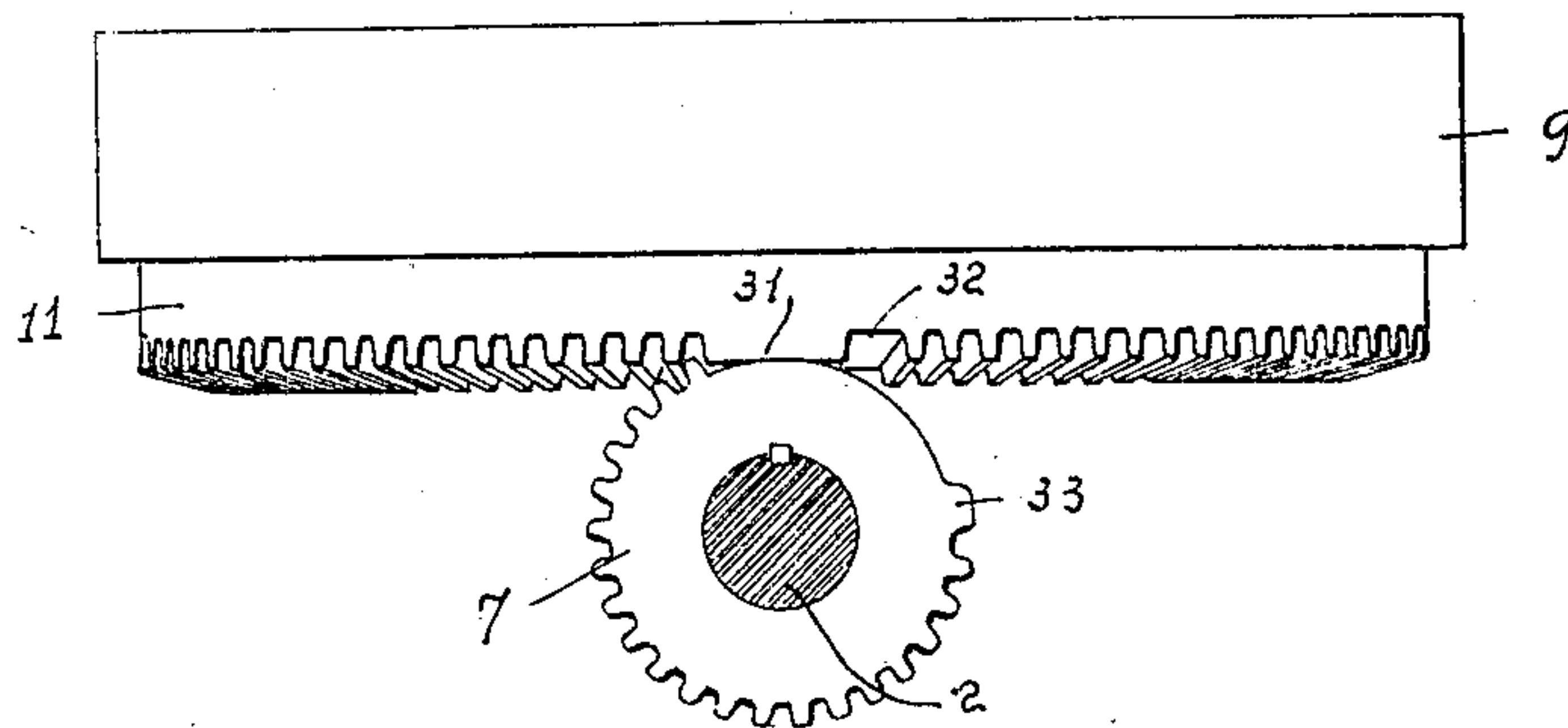
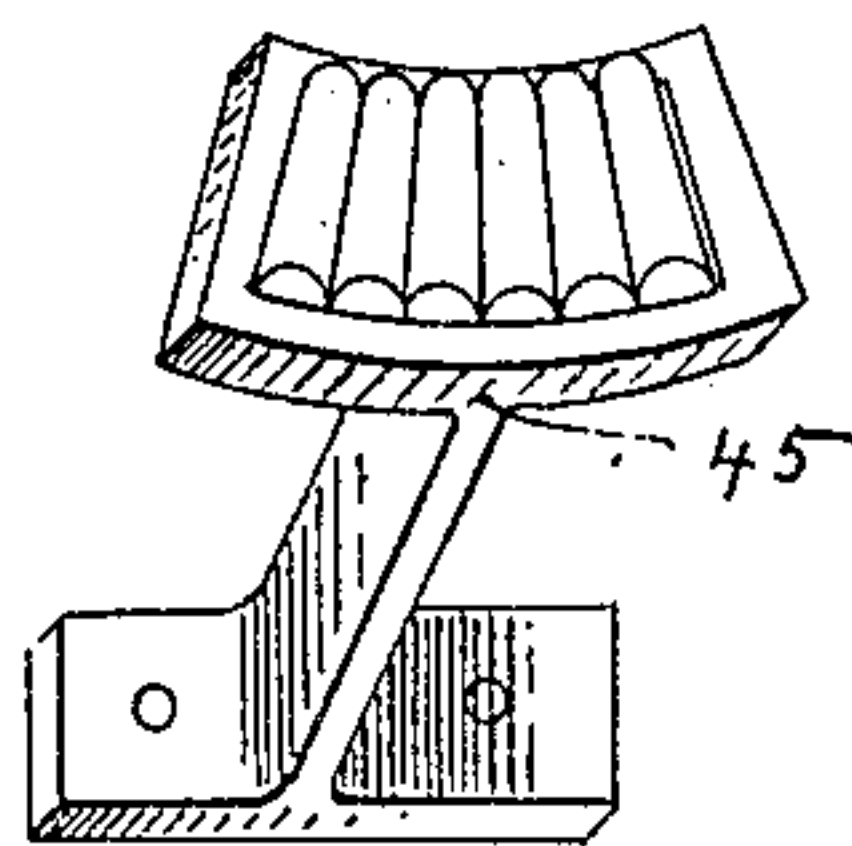


Fig. 6—



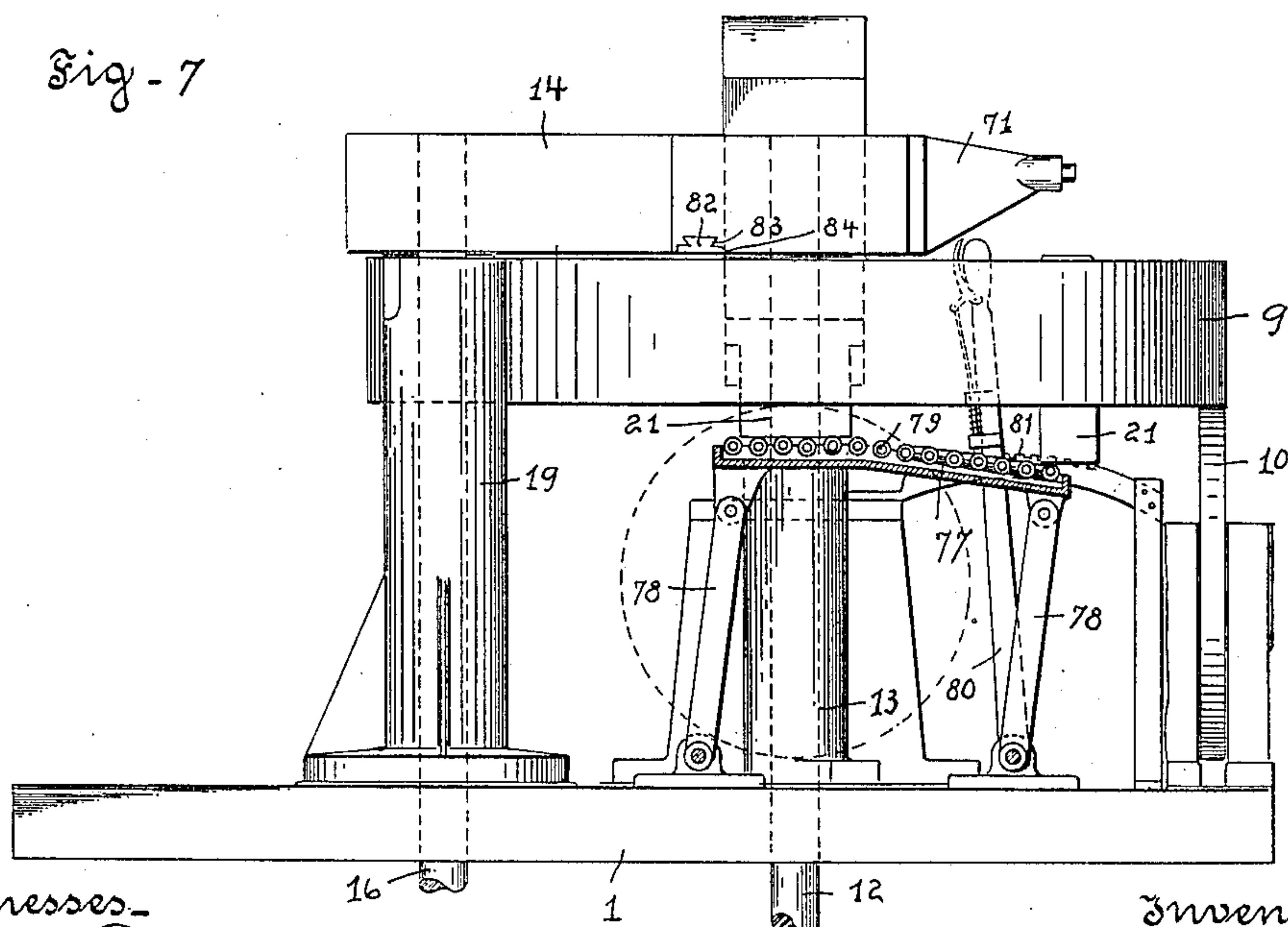
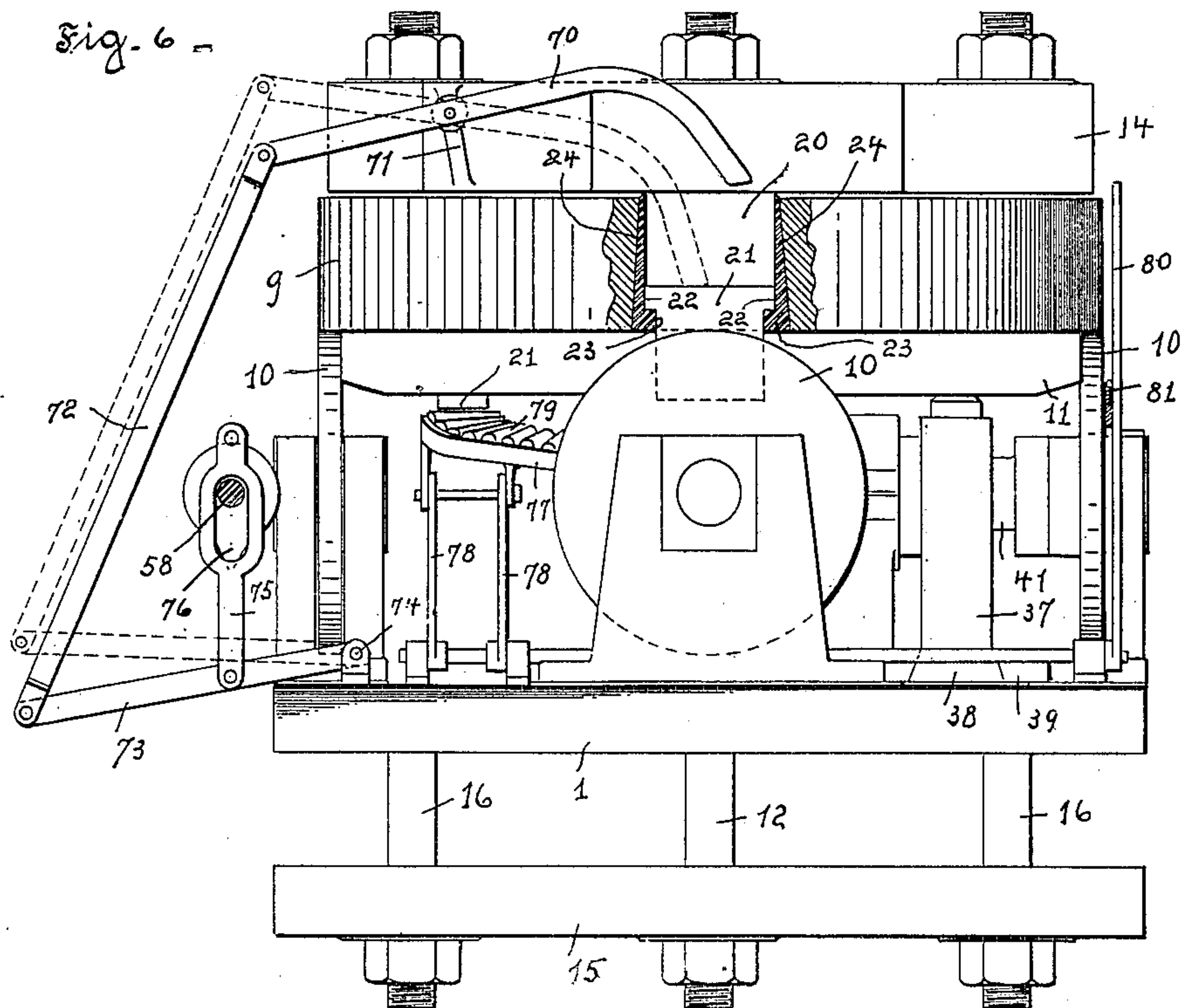
Witnesses—
M. G. Trout
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APPLICATION FILED OCT. 17, 1903.

4 SHEETS—SHEET 4.



witnesses—
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UNITED STATES PATENT OFFICE.

CHARLES W. REYNOLDS, OF TOLEDO, OHIO.

BRICK-PRESS.

No. 825,614.

Specification of Letters Patent.

Patented July 10, 1906.

Application filed October 17, 1903. Serial No. 177,491.

To all whom it may concern:

Be it known that I, CHARLES W. REYNOLDS, a citizen of the United States of America, residing at Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Brick-Presses, of which the following is such a full, clear, and exact description as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to improvements in machines for pressing bricks, asphalt blocks, or other material which must be subjected to heavy pressure in order to be given the proper shape and consistency.

In the specification of Letters Patent No. 700,823, dated May 27, 1902, I have shown and described an improved brick-press of the kind wherein a mold-wheel is kept in continuous motion, so that the operations of filling a mold, pressing a brick, and expelling a brick are all carried on at one and the same time without any cessation of motion. In practice I have found that by reason of the very heavy pressure that is required in making pressed brick and asphalt blocks the stopping of the mold-wheel while the heaviest pressure is being applied results in a great saving of power required to run the machine, as well as reducing the strain upon the machine incident to driving the mold-wheel under pressure.

One of the objects of my present invention is therefore to provide means for stopping the mold-wheel for a portion of the time consumed in each revolution of the driving-shaft and holding it stationary while the heaviest pressure is applied.

A further object is to provide means of insuring the return of the movable mold-bottom to its lowest position before filling the mold.

A further object is to provide means for regulating the height of the movable mold-bottom at the will of the operator, so as to change the depth of the mold to make the size thereof correspond with the varying consistency of the material with which it is filled.

Other and further objects of my invention will appear in the novel construction, combination, and arrangement of the parts hereinafter described and claimed, and illustrated in the drawings, in which—

Figure 1 is a top view of a machine constructed in accordance with my invention. Fig. 2 is a vertical cross-section on the line $x-x$. Fig. 3 is a vertical cross-section on the line $y-y$. Fig. 4 is a view of the under side of the mold-wheel, showing the annular driving-rack. Fig. 5 is a side elevation of the pinion driving the mold-wheel, showing the stop motion. Fig. 6 is a side elevation of the mechanism arranged to force the movable mold-bottom to its lowest position. Fig. 7 shows a device arranged to regulate the height of the movable mold-bottom while the mold is being filled, and Fig. 8 is a perspective view of the guide that prevents the mold-bottom from dropping between the pressing and expelling plungers.

In carrying out my invention I employ a supporting frame or platform 1, on which the pressing machinery is mounted. On this platform, about the medial lines of the same, I secure journal-boxes on which a driving-shaft 2 is mounted, said driving-shaft carrying a belt-wheel 3, through which motion may be imparted thereto from any suitable motor. On the driving-shaft I secure or form a cam or eccentric 4, which is fitted in a compressing-plunger 5. The driving-shaft also carries a roller or disk 6, a pinion 7 adjacent to said cam, and a bevel-pinion 8 on the inner end of said shaft. The disk or roller 6 bears against the under side of the mold-wheel 9, which rests on and is supported by said disk and similar disks 10, arranged at intervals around and below the same. The pinion 7 meshes with an annular rack 11 on the under side of the mold-wheel, so that the motion of the driving-shaft is transmitted directly to the mold-wheel. The mold-wheel is held in position by a central bolt 12 and is supported centrally by a shoulder on a hollow post or column 13, rising from the platform 1 around said bolt. This bolt 12 passes upward through the mold-wheel and the head-block 14 and downward through the platform and a resistance-plate 15 below the same. This bolt, therefore, serves not only as a pivot for the mold-wheel, but also serves to secure the head-block in place. The head-block is further secured in position by means of bolts 16, passing through its corners beyond the mold-wheel and downward therefrom through the platform and the resistance-plate. Strong springs 17 are coiled around and near these

bolts between the platforms and the resistance-plate, the springs that surround said bolts being held in place by lugs 18 on the top of the resistance-plate and the bottom of the platform 1. Said springs serve to hold the head-block down to the mold-wheel, while at the same time permitting it to yield sufficient to regulate the proper tension or amount of pressure to be given to a block to make it of the proper size and density. By having a resistance-plate common to all the bolts I insure the head-block moving evenly throughout, and so maintaining its horizontal position.

In order that the springs 17 may not draw the head-block down onto the mold-wheel so strongly that the frictional contact will retard or prevent the rotation of the mold-wheel, I surround or partly surround the bolts 16 with castings or columns 19 and carry the upper ends of the post 13 up to the head-block, so that the said posts and columns support the head-block, as will be readily understood.

The mold-wheel is preferably constructed with four molds or openings 20, though any number that is adapted to the size of the wheel and to the speed of the other working parts of the press may be used. In each mold or opening 20 is a movable mold-bottom 21, consisting of a solid block provided on its ends with shoulders 22, adapted to rest upon shoulders or stops 23 in the walls of the mold-cavities, thus preventing the bottoms from dropping out of the molds. As the mold-wheel rotates a mold is carried under a neck, where it is filled. The mold-bottom is then forced upward to carry the material against the presser-plate in the head-block to press the brick and is then further raised to the top of the mold to discharge the formed brick.

The mold-wheel is preferably made of cast-iron, and the mold-openings are lined on the sides and ends thereof with hardened-steel facing or liners to provide a hard wearing-surface and to make it possible to renew the molds without changing the wheel.

The end liners 24 are provided with the above-mentioned shoulders 23, and the side liners 25 are bolted to the under side of the mold-wheel by suitable bolts 26 through flanges 27, let into recesses 28 in the mold-wheel. Said liners are preferably made wedge-shaped and are set with the thick end of the wedge downward, the sides of the cavities in the mold-wheel being made at the proper angle to receive said liners and allow the inner surface thereof to stand perpendicular, making the sides and ends of said mold-cavities parallel with each other when said liners are properly placed. The end liners 24 are first inserted and are held in place by the side liners 25. The tops of said liners

protrude slightly above the general surface of the mold-wheel, so that in filling a mold and in pressing a brick the cut-off bar 82 and the presser-plate 46 will touch the molds without touching any other portion of the mold-wheel.

The compressing-plunger 5 consists of a block having a flat top and slidably fitted in the vertical arms 29 of a slide 30, arranged on the platform 1 below the driving-shaft.

The pinion 7 has a portion of its cogs removed, so that it does not engage the cogs upon the annular rack 11 continuously. Preferably about one-third of the cogs on said pinion are so removed, so that during one-third of each revolution of the driving-shaft 2, the mold-wheel stands still. The remaining two-thirds of the pinion 7 contains enough cogs to engage the annular rack 11 and drive the mold-wheel forward the entire distance from one mold to the next succeeding one. The movement of the parts is so timed that the mold-wheel comes to rest soon after the plunger 5 has engaged the movable mold-bottom 21 and before the material to be pressed has attained very much solidity. Then as the plunger 5 continues to raise the mold-bottom the pinion 7 releases its hold upon the rack 11 and does not again engage it until the plunger 5 has attained its highest point, has formed and solidified the brick, and is releasing its pressure upon the same.

In order to guard against the breaking of cogs upon the annular rack 11 and upon the pinion 7 in starting the mold-wheel into motion after a period of rest, I provide a thick cog or solid block of iron 31 at intervals on the rack, followed by a wide interval 32 between cogs adapted to engage a thick cog or solid block 33 on the pinion 7 at the time when the said pinion engages the rack to move the mold-wheel forward.

The annular rack 11 is preferably made in sections with a flange 34, through which it is secured by suitable bolts to the mold-wheel, so that worn and broken sections are easily removed and replaced.

As the plunger 5 has a forward movement while the pressure is being applied I find it advisable to fit antifriction-rollers 35 in the top of the plunger to reduce the wear.

When the mold-wheel has made one-fourth of a revolution or has traveled the distance from one mold to the next succeeding after leaving the compressing-plunger, the mold-bottom will be farther raised by the expelling-plunger 36 to discharge the pressed brick. This plunger consists of a block slidably mounted in the vertical arms 37 of a slide 38, mounted on ways 39, arranged longitudinally on the platform 1. The plunger is operated by a cam 40 on a short shaft 41, mounted in suitable bearings on the platform and carrying on its inner end a bevel-gear pinion

42, which meshes with an idler-pinion 43, by which it is connected with the pinion 8 on the inner end of the driving-shaft. The upper end of this plunger is tapered so as to form an extension or finger 44, adapted to enter the mold, so as to raise the pressed brick clear of the top thereof.

In order to prevent the mold-bottom dropping after it passes the compressing-plunger until it is engaged by the expelling-plunger, I provide a guide 45 between the limits of the movements of the two plungers, which is preferably provided with antifriction-rollers over which the mold-bottom moves and by which it is supported.

In order that the horizontal movement of the brick while it is pressed up to the head-block may not cause a scraping away of the top of the brick and may not retard by friction the movement of the mold-wheel during the short portion of the time that it is in motion while the brick is under pressure, I provide the movable pressure plate or block 46, mounted in a recess in the bottom of the head-block and pivoted at one end on the central securing-bolt 12. The free end of this presser-plate is widened sufficiently to cover the mold-opening, and it is held normally toward the initial end of the movement of the mold by a coiled spring 47, one end of which is hooked into a bar 48, extending outward from the free end of the pressure-plate, while the other is made fast to the bar 49, bolted to the head-block. In order to reduce the wear, I provide antifriction-rollers 50, which are made slightly tapering toward the inner end to correspond with the radius of the circle in which they travel between the head-block and the upper side of the pressure-plate, as shown. When the mold-bottom is raised by the compressing-plunger, the brick is forced against this pressure-plate and is held against it with such force as to cause it to move forward, following the movement of the brick. As soon as the plunger is withdrawn from the mold the pressure on the block is relieved, and the spring returns it to its initial position to be engaged by the succeeding brick in the same manner. This block moves in a curved path corresponding to the arc traveled by the mold; but it will not involve a departure from the invention to employ a block moving in a straight path. After the pressed brick is raised to the top of the head-block it is pushed from the mold-bottom by a rake consisting of a cross-head or plate 51, adapted to move over the mold-wheel and across the mold-opening and secured to the ends of arms 52, slidably mounted in keepers on the head-block. The opposite ends of these arms are connected by a rod 53, pivoted on the upper end of a lever 54, which is fulcrumed on a bracket 55, projecting from the head-block and has its lower

end depending into the path of a tappet or pin 56, on a disk or wheel 57. This wheel or disk is secured on a counter-shaft 58, which is mounted in suitable bearings on the platform and is rotated by the driving-shaft through the endless chain 59. The weight 60 is attached to the rake for the purpose of returning the same to its normal position after a brick has been discharged.

In order to retain the mold-wheel in the same position from the time the cogs of the driving-pinion 7 leave the rack 11 until they again engage it, I provide a locking device consisting of a plunger-pin 62, mounted in a bracket 63, secured to the head-block and adapted to enter holes 64, placed at regular intervals in the top of the mold-wheel, the intervals corresponding to the intervals between the mold-openings. Said pin is normally held down upon the mold-wheel by a spring 65, coiled around the pin and resting upon the shoulder 66 and against the top of the bracket through which the pin passes. Above the bracket said pin is secured to the upper end of the bent lever 67, fulcrumed upon said bracket at 68, the lower end of the said lever engaging the tappet or pin 69 on the disk-wheel 57. The movement of the parts is so timed that the pin 69, striking the lever 67, raises the pin 62 out of the hole 64 just as the mold-wheel is ready to move forward. Again, as the mold-wheel is ready to stop another hole 64 has moved up into position to receive the locking-pin 62, which is forced into it by the spring 65.

After a mold has passed the expelling-plunger the mold-bottom 21 will normally drop to its lowest position by gravity; but in practice I have found that asphalt-block material will sometimes squeeze in between said mold-bottom and the sides of the mold and cause it to stick. In order to insure its return to its lowest position, I provide a lever 70, fulcrumed on the bracket 71, secured to the head-block and having its forward end bent at nearly a right angle to enter the mold and press down the mold-bottom. The other end of said lever is joined by the connecting-bar 72 to a lever 73, having one end free and the other end fulcrumed on the pin 74, bolted to a block on the platform 1. Said lever 73 is pivoted near its center to a pitman 75, which is operated by a cam or eccentric 76 upon the counter-shaft 58.

In pressing asphalt blocks the material that is fed from a mixer into the mold is not of a uniform specific gravity, so that in order to make blocks of a uniform size and density it is necessary to regulate the depth of the mold so as to make its size correspond with the consistency of the material with which it is filled. To accomplish that object, I place under the mold-wheel directly below the filling-point and in the path of the mold-bot-

toms a guide 77, mounted upon columns 78, secured to the platform. Said columns are jointed at top and bottom and stand normally at a slight angle, so that raising them to a perpendicular position raises the guide 77. Said guide is provided with antifriction-rollers 79 and is attached to a hand-lever 80, by which it is moved forward and upward or backward and downward. Said lever is of the ordinary type of hand-lever working upon and held in the desired fixed position by the notched segment of a circle 81, secured to the framework of the press.

In order to fill the molds evenly with the material to be pressed into bricks and to prevent the material from following a mold as it travels beyond the neck which conveys the material to it, I provide a cut-off bar 82, which slides into a dovetailed groove 83 in the head-block at the point where the mold in passing under leaves the neck. Said cut-off bar has a projecting edge 84 set so as to scrape the top of each mold as it passes under the same.

The construction and arrangement of the several parts being thus made known it is thought the operation of the machine will be readily understood. A mixer above the machine is filled with the material to be made into bricks or blocks, which is conveyed by a suitable neck from the bottom of the mixer to the molds as they rotate in turn under the neck. The driving-shaft is continuously rotated, and its motion is imparted to the counter-shaft and the expelling-plunger shaft continuously and to the mold-wheel at regular intervals, so that the operation of forming, pressing, and discharging bricks are performed continuously, automatically, and simultaneously. As the mold-wheel rotates it carries an empty mold under the neck, and enough material to form a brick then falls into the mold. As the movement of the wheel continues the filled mold is brought into position over the compressing-plunger, by which the mold-bottom is raised, as before described, to press the brick, and the succeeding empty mold is simultaneously brought into position below the neck. The further continued movement of the mold-wheel carries the pressed brick over the expelling-plunger, which elevates it to a point clear of the top of the mold-wheel, from which it may be removed by an attendant, or it may be pushed by the rake onto an endless carrier. When the mold clears the expelling-plunger, the mold-bottom at once drops to its lowest position or is forced down, and the mold is then ready to receive a second charge of the material.

The machine is simple and compact, and its operation is rapid and certain.

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

1. In a brick-press, a mold-wheel, a movable mold-bottom, pivotally-mounted columns, an inclined guide pivotally secured to the columns and adapted to regulate the depth of the mold, antifriction-bearings carried by the guide, a lever having connection with one of the columns, whereby the same may be adjusted, and operating means.

2. In a brick-making machine, a rotary mold-wheel provided with forming-cavities, a drive-shaft and gearing for intermittently rotating said mold-wheel, a head-block, movable mold-bottoms in said mold-cavities, plungers coacting with said movable mold-bottoms for compressing the material and discharging the finished bricks, means actuated by the driving mechanism for operating said plungers, a counter-shaft driven from the drive-shaft, an automatically-retracted scraper for removing the finished bricks, a spring-projected locking device to intermittently engage the mold-wheel, a stroker for returning the mold-bottoms to normal position, pivotally-mounted levers operatively connected with the scraper and locking device, a disk mounted upon the counter-shaft and provided upon the opposite sides thereof with tappets arranged at different points in its path of rotation for periodically actuating said levers, and eccentric mechanism for operating the stroker from the counter-shaft.

3. In a brick-press, a head-block, a mold-wheel provided with a mold-cavity, a lining for the cavity projecting above the mold-wheel, and a scraper carried by the head-block to remove excess material from the projecting edge of the liner, substantially as described.

4. In a brick-press, a mold-wheel provided with a mold-opening, and a sectional lining for said opening and projecting above the mold-wheel, as and for the purpose set forth.

5. In a brick-press, a mold-wheel provided with a mold-opening, and a sectional lining for said opening comprising end and side liners, said side liners projecting above the mold-wheel, as and for the purpose set forth.

6. In a brick-press, a mold-wheel provided with a mold-opening, and a sectional lining for said opening comprising end liners having shoulders, and side liners provided with securing-flanges, said side liners projecting above the mold-wheel, as and for the purpose set forth.

7. In a brick-press, a mold-wheel provided with a mold-opening, and a sectional lining for said opening comprising wedge-shaped end and side liners, the end liners being held in place by the side liners.

8. In a brick-press, a rotary mold-wheel provided with forming-cavities, driving mechanism therefor, mold-bottoms vertically movable in the cavities, means for raising the mold-bottoms to eject the finished bricks, an inclined track adapted to be engaged by the

mold-bottoms, whereby the latter may be raised or lowered to regulate the depth of the forming-cavities, pivotal supports for said track, and means for swinging said supports in one direction or the other to adjust said track in the direction of rotation of the wheel.

In testimony whereof I have signed this

specification in the presence of two subscribing witnesses.

CHARLES W. REYNOLDS.

Witnesses:

B. W. OSBORNE,
GEO. F. SHEPHERD.