W. C. SHORT.

BRICK PRESS.

APPLICATION FILED JUNE 17, 1908.

943,797.

Patented Dec. 21, 1909.

6 SHEETS—SHEET 1.

Fig. 1.

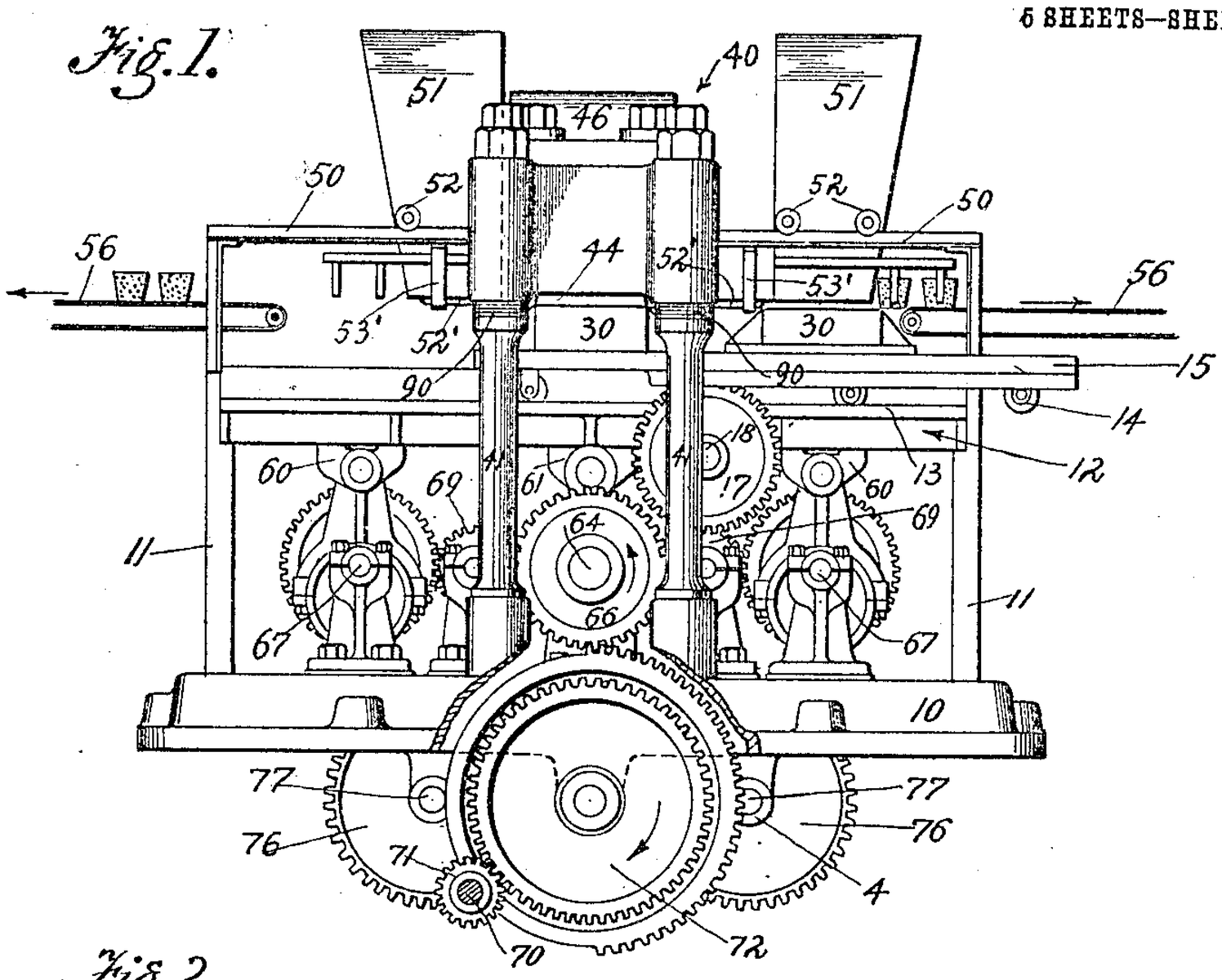
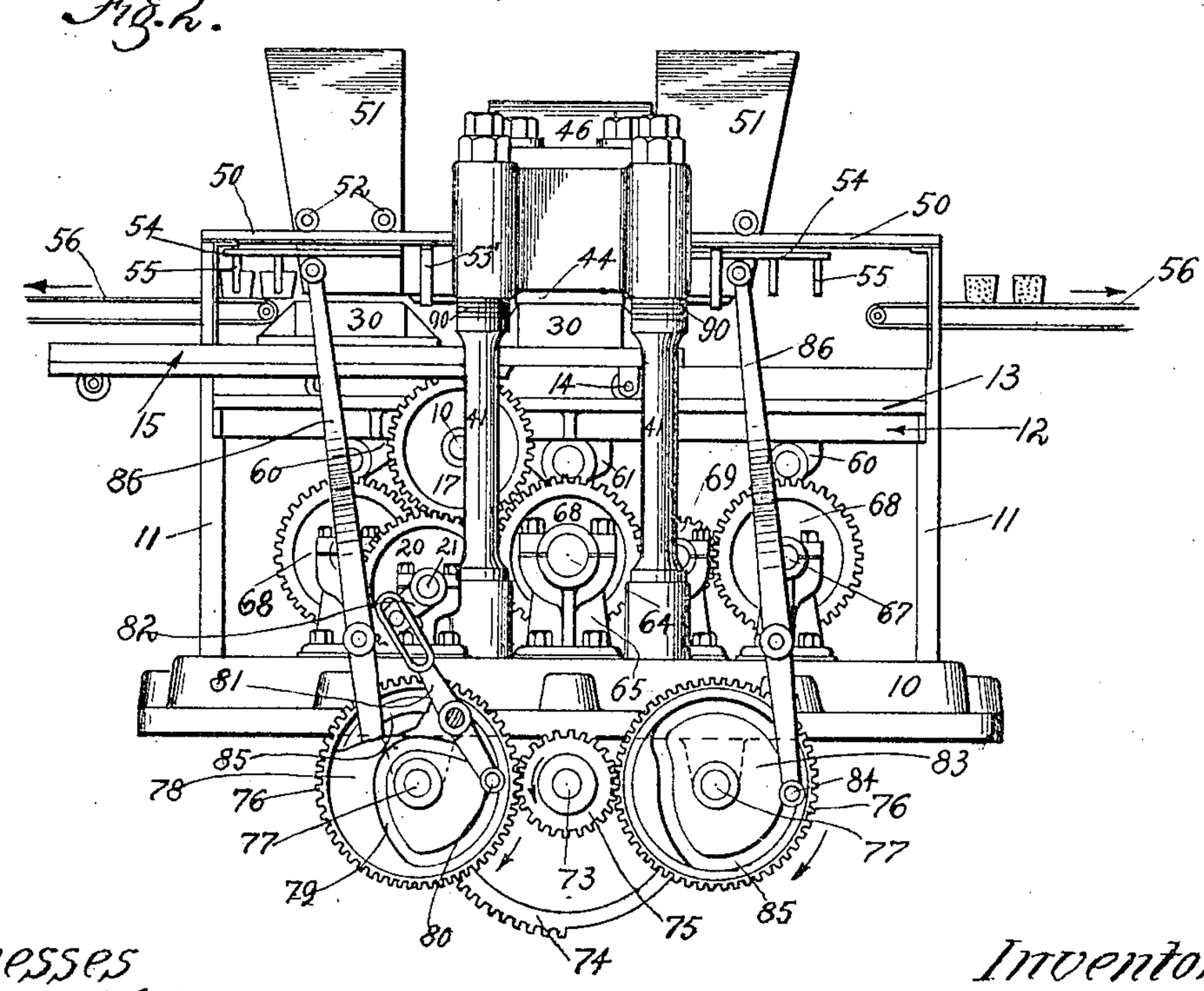


Fig. 2.



Witnesses

Rudolf Wildenhayn

James T. Barkelew

Inventor

Walter C. Short.

By Howard & Howard.

Attorneys.

W. C. SHORT.

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5 SHEETS—SHEET 2.

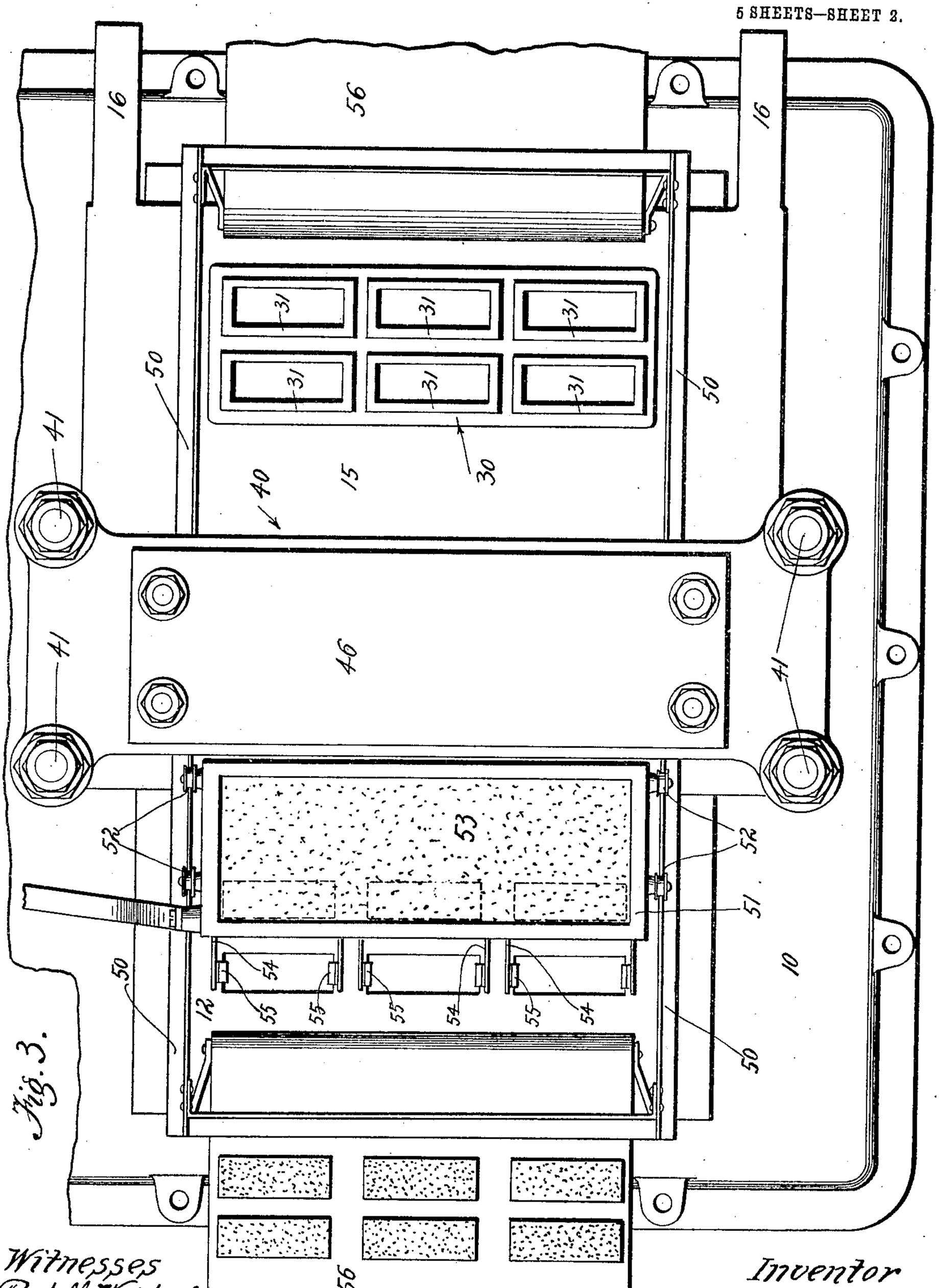

Fig. 3.

Witnesses
Rudolf Wildenhain
James T. Bickelhaupt

Inventor
Walter C. Short.
By Hazard & Howe
Attorneys.

W. C. SHORT.

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5 SHEETS—SHEET 3.

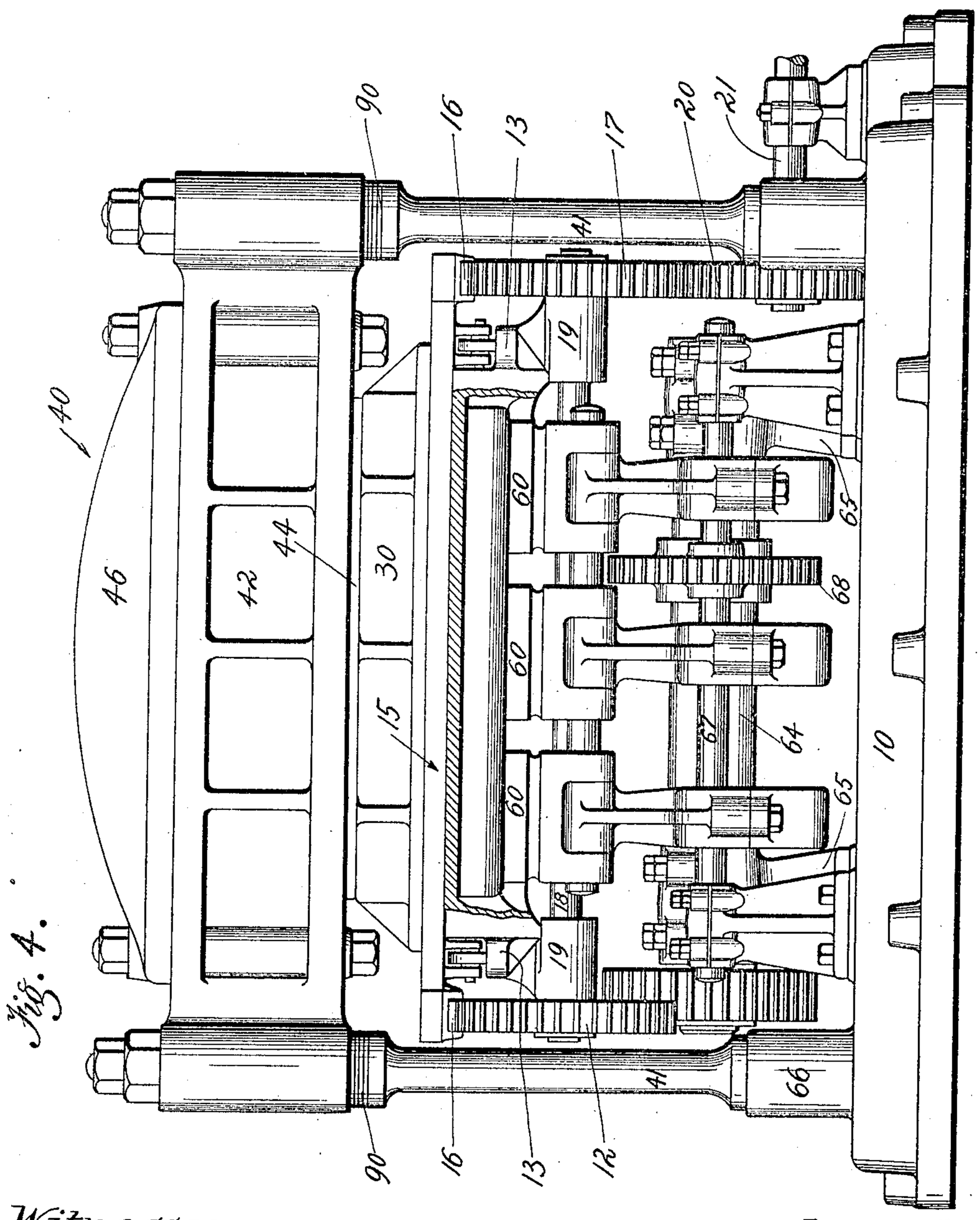

Fig. 4.

Witnesses
Rudolf Wildenhayn.
James T. Barkelew

Inventor
Walter C. Short.
By Howard & Howard
Attorneys.

W. C. SHORT.

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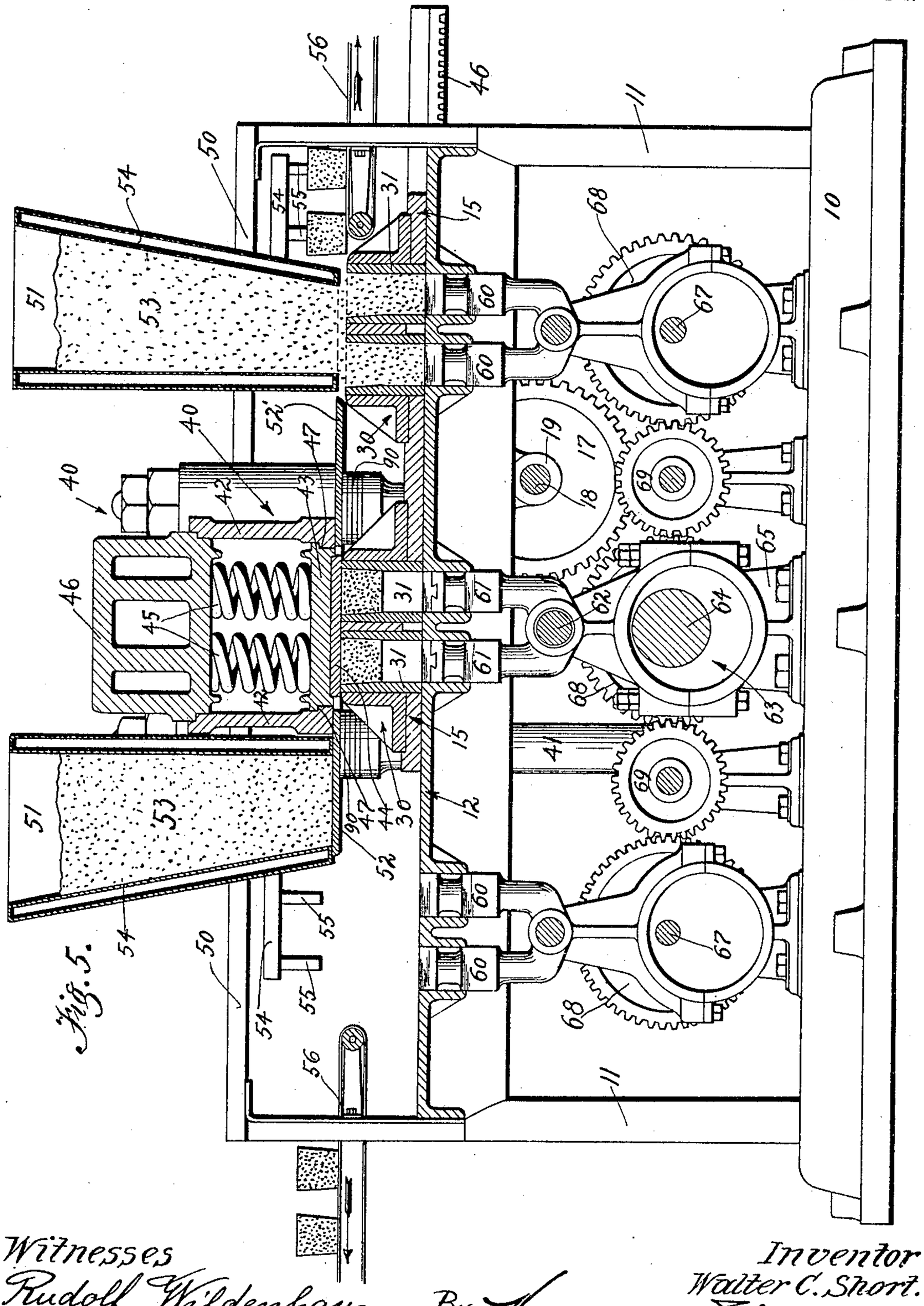
5 SHEETS—SHEET 4.



Witnesses
Rudolf Wildenhayn
James T. Fairbairn

Inventor
Walter C. Short.
By Hazard & Shawe
Attorneys.

W. C. SHORT.

BRICK PRESS.

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5 SHEETS—SHEET 5.

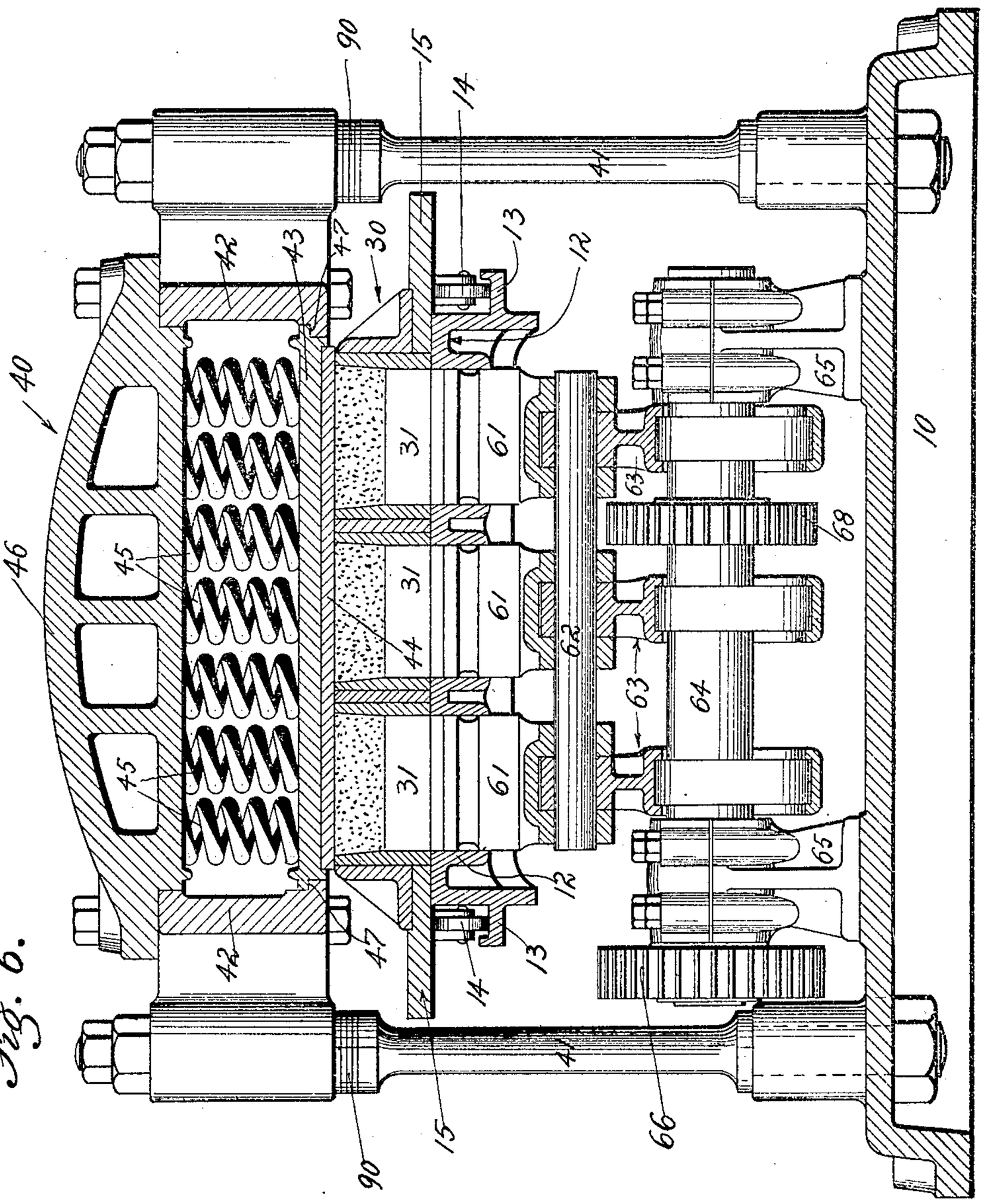

Fig. 6.

Witnesses
Rudolf Wildenhayn
James T. Buckelew

Inventor
Walter C. Short.
By Hazard & Thacher
Attorneys.

UNITED STATES PATENT OFFICE.

WALTER C. SHORT, OF LOS ANGELES, CALIFORNIA.

BRICK-PRESS.

943,797. Specification of Letters Patent. **Patented Dec. 21, 1909.**

Application filed June 17, 1908. Serial No. 438,894.

To all whom it may concern:

Be it known that I, WALTER C. SHORT, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Brick-Presses, of which the following is a specification.

This invention relates to a press for asphalt paving bricks and the like where it is necessary to subject the material in the molds to a high pressure in order to form a compact and durable brick of the same.

The invention consists primarily in mechanism for carrying two sets of molds alternately under a compression head where the bricks are formed. The mechanism is so arranged that while the bricks are being formed in one set of molds the finished bricks are being ejected from the other side and a new charge of material being taken in. The first set with the finished bricks therein is then moved from the compression head and the set with the charge of material therein is moved under the head and the bricks compressed therein while the finished bricks are ejected from the first set of molds and a new charge of material taken therein.

In the accompanying drawings, forming a part of this specification:—Figure 1,— is a front side elevation of the complete machine. Fig. 2,—is a rear side elevation of the same. Fig. 3,— is an enlarged plan view with one of the hoppers removed. Fig. 4,— is an end elevation of the machine without the hoppers and conveying mechanism. Fig. 5,— is a longitudinal vertical section of the complete machine. Fig. 6,— is a central cross-section of the machine as shown in Fig. 4.

In the drawings 10 designates a base of any suitable character to support the various mechanisms of the press and supporting by means of a suitable member 11 a flat topped table 12 most clearly shown in Fig. 5. This table is ribbed and strengthened properly and carries on each of its longitudinal edges below its top a track 13 upon which rollers 14 carrying carriage 15 are adapted to operate. Carriage 15 is provided on each of its longitudinal edges with a sunk rack as shown in Fig. 4 through the medium of which the carriage is adapted to be reciprocated on table 12. Racks 16 are engaged with by gears 17 mounted on a shaft 18 journaled in bearings 19 secured to table 12, and these gears are operated through the medium of the gear 20 mounted on a small shaft 21 and meshing with one of gears 17. Shaft 21 is operated by a cam movement as will be hereinafter described.

Carriage 15 carries two sets 30 of molds 31, these molds being shown in sectional configuration in Figs. 5 and 6. In the present machine I have utilized two sets of six molds each as that number is convenient with the size of asphalt bricks used for paving and like purposes. As shown in Fig. 5 these molds are straight in their lower halves and slightly tapered above, this tapered portion allowing the finished bricks to be easily removed from the mold, the finished brick occupying only the tapered portion of the mold as shown in Fig. 5. The movement of carriage 15 is of such extent that the sets of molds are alternately carried to the position shown for the left hand set in Fig. 5 directly under compression head 40 of the machine. Compression head 40 is preferably mounted on independent supports 41 above base 10 and consists of a box frame 42 carrying a pressure plate 43 so as to slide vertically therein. Pressure plate 43 is provided with a hardened steel faceplate 44 against which the direct compression of the bricks takes place. Springs 45 which hold pressure plate 43 in place against the upward pressing force used to compress the bricks are held between the pressure plate and an arch plate 46. These springs press downwardly upon the pressure plate and hold it in such a position that the sets of molds may easily slide under faceplate 44, shoulder stops 47 being provided on the pressure plate and box 42 to prevent the further downward movement of the face plate. The total pressure afforded by springs 45 is equal to or slightly greater than the total pressure with which it is desired to compress the six bricks of one set, the springs being interposed merely to relieve the mechanism from abnormal strains in case too large a quantity of material should be compressed into a single brick.

Suitably mounted above table 12 are rails 50 upon which hoppers 51 are adapted to be reciprocated. The hoppers being provided with rolling supports 52. These hoppers normally stand over bottoms 52′ attached to compression head 40 and supported from rails 50 by means of members 53′. They are filled with material, in this case mixed asphalt and sand 53 by any convenient means and their walls are made hollow to contain

a chamber 54 by means of which they may be steam heated to keep the material 53 in a condition to be operated upon. The hoppers also carry a series of arms 54 having depending spring clips 55 which engage the finished bricks as illustrated and move them into conveyers 56 whence they are carried to any desired position.

Table 12 is provided with three sets of apertures forming vertical guideways for pistons 60 and 61, these pistons coming exactly beneath the terminal positions of the molds on carriage 15 as shown in Fig. 5. Pistons 61 are the compressing or brick forming pistons and pistons 60 are used for ejecting the finished bricks into engagement with spring clips 55 to be removed from the machine. Pistons 61 are connected in pairs as shown in Fig. 5 to a reciprocating shaft 62 operated by means of eccentric gear 63 from a large shaft 64 mounted in bearings 65 across the central portion of the machine. A large driving gear 66 on the end of shaft 64 forms a medium of operation of this shaft from the gearing connections to be hereinafter described. Ejecting pistons 60 are operated from shafts 67 by an eccentric mechanism similar to those just described, gears 68 on shafts 64 and 67 and with idlers 69 serving to drive shafts 67 in synchronism with shaft 64, gears 68 being all of a size. The mechanism is so assembled that pistons 60 and 61 reciprocate through the same phases at the same time as indicated by their comparative positions as shown in Fig. 5.

The complete machine is conveniently operated from a shaft 70 carrying pinion 71 which meshes with the large gear 72 for speed reduction. Gear 72 is mounted on main driving shaft 73 of the machine, this shaft being mounted on any suitable bearings adjacent or connected to base 10. Shaft 73 carries a large gear 74 of exactly twice the diameter of gear 66 on shaft 64, gear 74 being half blank and engaging with gear 66 so that upon each revolution of shaft 73 shaft 64 will go through a complete revolution but the duration of time of revolution of shaft 54 will only be half the duration of time of revolution of shaft 73. Thus pistons 60 and 61 will be reciprocated up and down once during one half of the revolution of shaft 73 and will then remain still, in their lower position, during the remaining half of the revolution. This intermittent motion is provided in order that the carriage may be moved from one of its positions to the other while the pistons are not operated. Mounted on shaft 73 at the back side of the machine is a pinion 75 which meshes with two gears 76 of twice its diameter. Gears 76 are mounted on shafts 77 which carry the cams for operating carriage 15 and hoppers 51. Cam 78 which operates the carriage is provided with a groove 79 of such configuration that the carriage moves from one position to the other during a quarter revolution of the cam, then remains stationary during a quarter revolution, moves back to its original position during the next quarter and finally remains stationary during the last quarter. The cam groove is connected by means of a cam follower 80 and connecting arm 81 to an arm 82 on shaft 21 from which the carriage is operated. On each of shafts 77 is mounted a cam 83 for operating the hoppers 51. The cam followers 84 run in grooves 85 of cams 83 and levers 86 connect the followers to hoppers 51. Grooves 85 are of such a configuration that the hoppers remain stationary in their normal positions from bottoms 52 for five eighths of a revolution of cams 83, moving forward to their positions over the molds as shown for the lefthand hopper in Fig. 2 during the following one eighth of a revolution and then moving to their normal position during the remaining quarter of the revolution, this return movement being so timed as to be synchronous with the return movement of the carriage as determined by cam groove 79.

The mechanism is shown in its position where a set of bricks have been just formed in a mold under the compression head and a charge of material has been taken into the other set of molds, the carraige being just ready to be moved to its other position. This is seen by referring to cam groove 79. Shaft 64 has just passed through a complete revolution and the blank portion of gear 74 is just beginning to pass under gears 66. Thus during the next quarter revolution of shafts 77 and half revolution of shafts 73 carriage 15 is moved from its position illustrated to its opposite terminal position. Gear 74 having moved through a half revolution shaft 40 is again operated and pistons 60 and 61 are reciprocated once up and down. This reciprocation of the pistons compresses the charge of material in a set of molds beneath the compression head into the form illustrated and forces the completed bricks into engagement with spring clips 55. A complete reciprocation of pistons 60 and 61 occupies a quarter revolution of shaft 77 during which quarter revolution carriage 15 is at rest. During the one eighth of a revolution of shafts 77 occupied by the upward movement of pistons 60 and 61 hoppers are at rest but as the piston descends the hopper which supplies material to the molds from which the bricks have just been ejected move forward over those molds and a supply of material 53 falls into the molds during the next half revolution of shaft 73 and quarter revolution of shafts 77 the pistons remaining stationary while the carriage and the hopper which has moved upwardly both move back, the molds

which have just been filled moving directly under the compression head. The operation of compressing the material in the molds and of ejection of the bricks from the other set of molds is then repeated.

From the foregoing description it will be seen that I have provided a continuously operating mechanism for forming bricks of material under extremely high pressure. The efficiency of the device depends upon its ability to handle continuously the material and this is seen to depend upon the operation of simultaneously forming bricks and of ejecting the completed bricks and preparing for the formation of subsequent ones. The broad mechanism to accomplish this operation is thought to be novel, the details being allowably changed to suit individual requirements as to sizes of bricks and the pressures to which it is desired to subject them in formation. The size of the bricks may be easily changed by substituting molds of different sizes, the compression head being adjustable in height by means of washers 90 on supports 41.

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

1. In a brick machine, a reciprocating carriage, brick molds carried by said carriage, movable hoppers adapted to supply material to said molds, and means to move said hoppers in the same direction as the motion of said reciprocating carriage.

2. In a brick machine, a reciprocating carriage, brick molds mounted on said carriage, a reciprocating hopper adapted to supply material to said molds, and means to move said hoppers at the same rate of movement and in the same direction as said reciprocating mold, after said mold has been charged.

3. In a brick machine in combination, a brick mold, said mold being formed with parallel walls in one portion of said mold, and inclined in another portion of said mold, compressing pistons operating in the portion of the mold having parallel walls, and means for driving said piston, means for causing said mold to have a reciprocatory movement, a reciprocating hopper adapted to supply the material to said molds, and means to move said hopper at the same rate of speed as said reciprocating mold after said mold has been charged.

4. In a brick machine, a reciprocating carriage, brick molds on said carriage, a reciprocating hopper adapted to supply material to said molds, means to move said hopper at the same rate of speed and in the same direction as said reciprocating mold after said mold has been charged, means for compressing brick in said mold, and means for ejecting brick from said molds, said compressing means and said ejecting means being geared together in such manner as to have a simultaneous cycle of operation.

In witness that I claim the foregoing I have hereunto subscribed my name this 10th day of June, 1908.

WALTER C. SHORT.

Witnesses:
EDMUND A. STRAUSE,
OLLIE PALMER.