

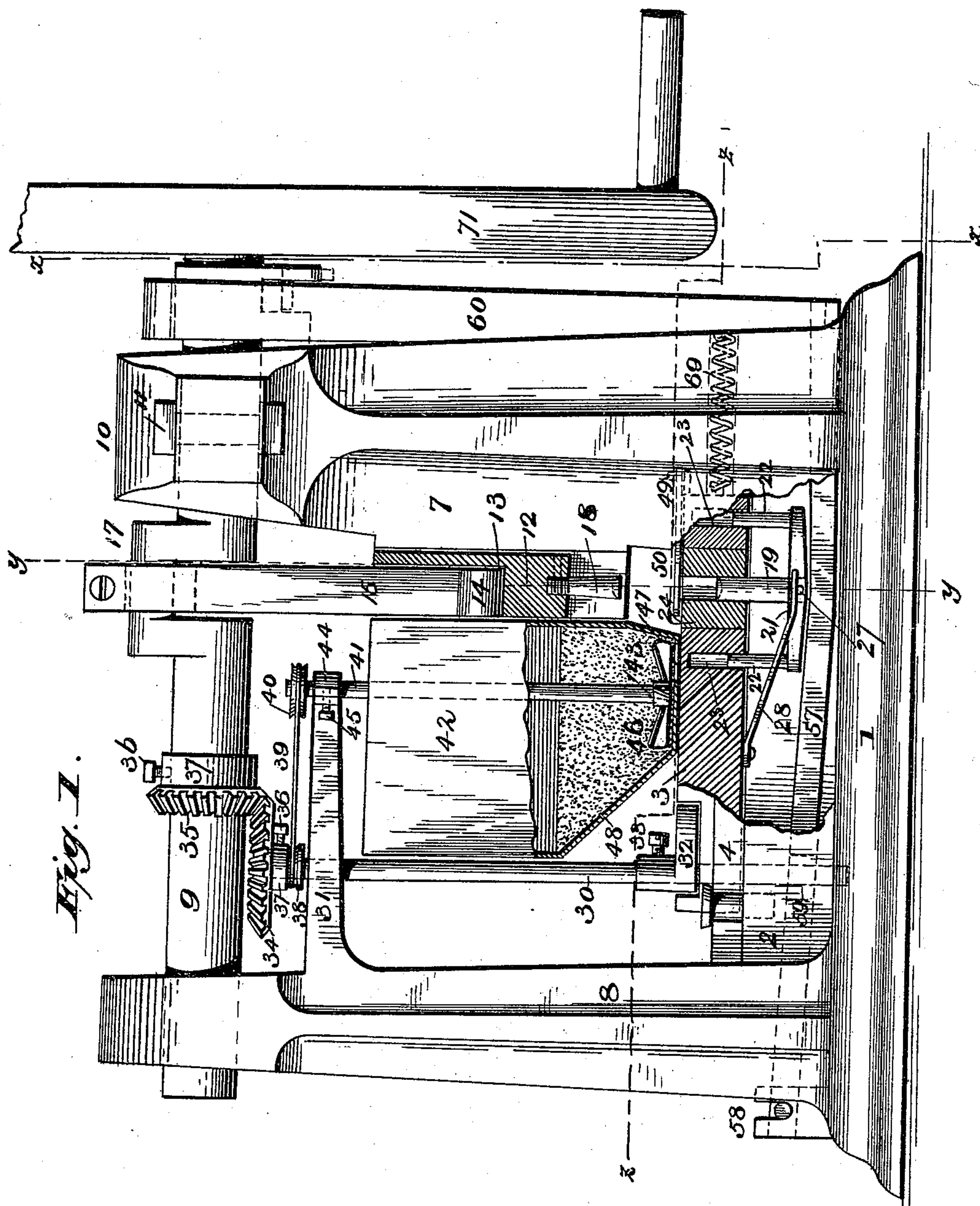
(No Model.)

3 Sheets—Sheet 1.

F. W. JORDAN.  
MACHINE FOR COMPRESSING TABLETS.

No. 438,763.

Patented Oct. 21, 1890.



Witnesses  
F. L. Ourand.

Wm. Bagger.

By his Attorneys,

C. Snow & Co.

Inventor  
Frank W. Jordan.

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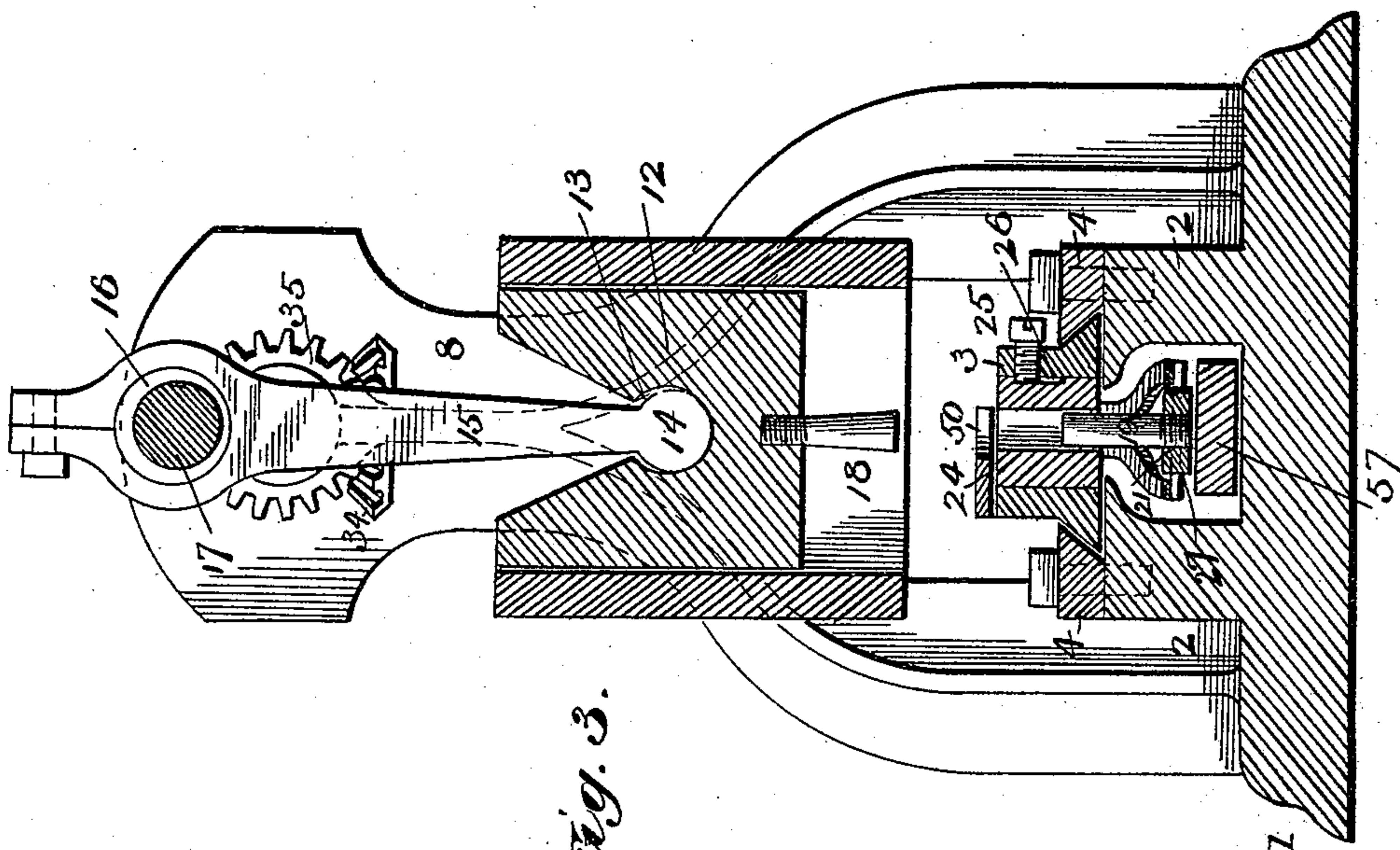


Fig. 3.

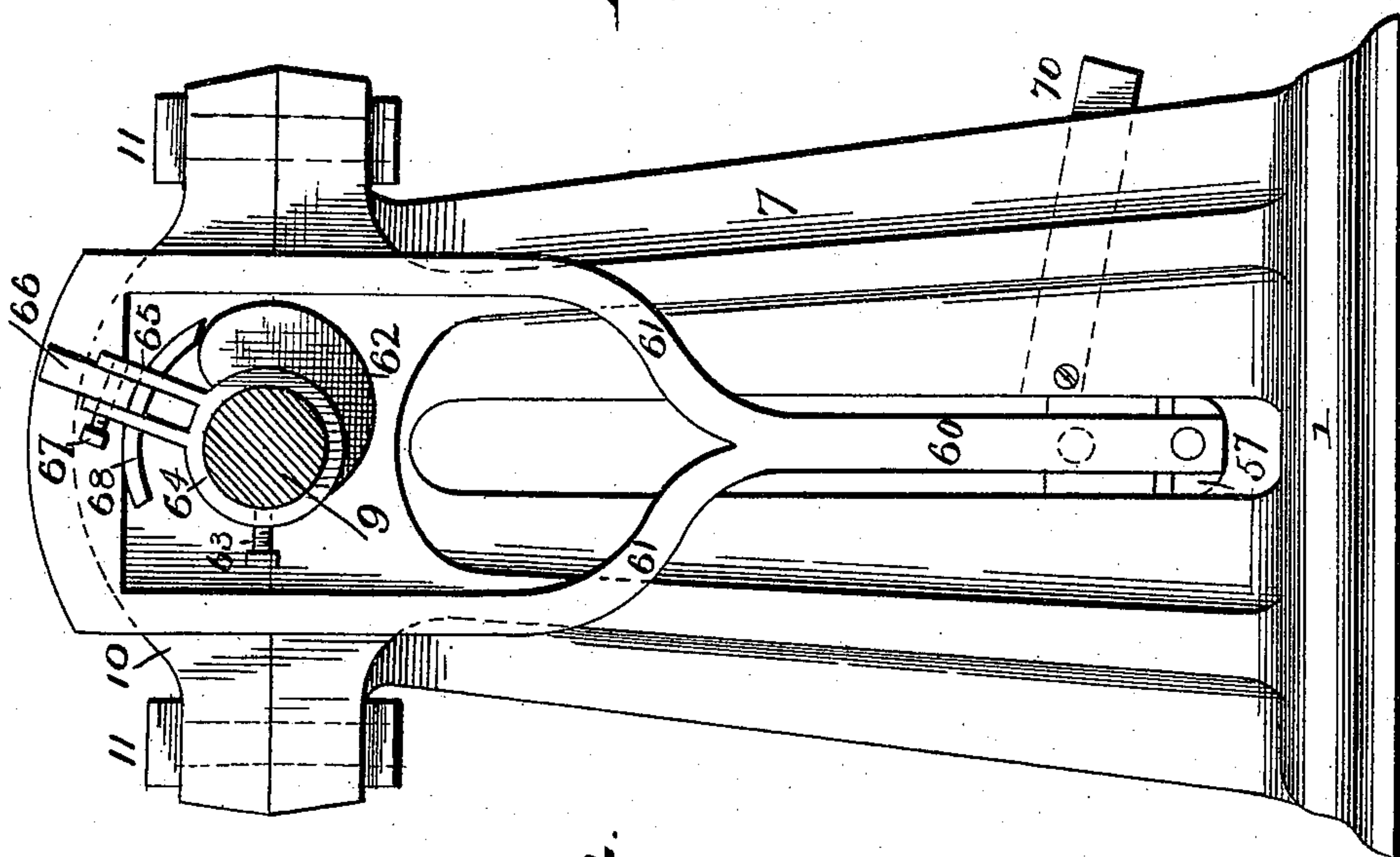


Fig. 2.

Witnesses

*F. L. Curand*

*Wm. Bagger*

Inventor

*Frank W. Jordan*

By his Attorneys,

*Chas. Snow & Co.*



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Fig. 4.

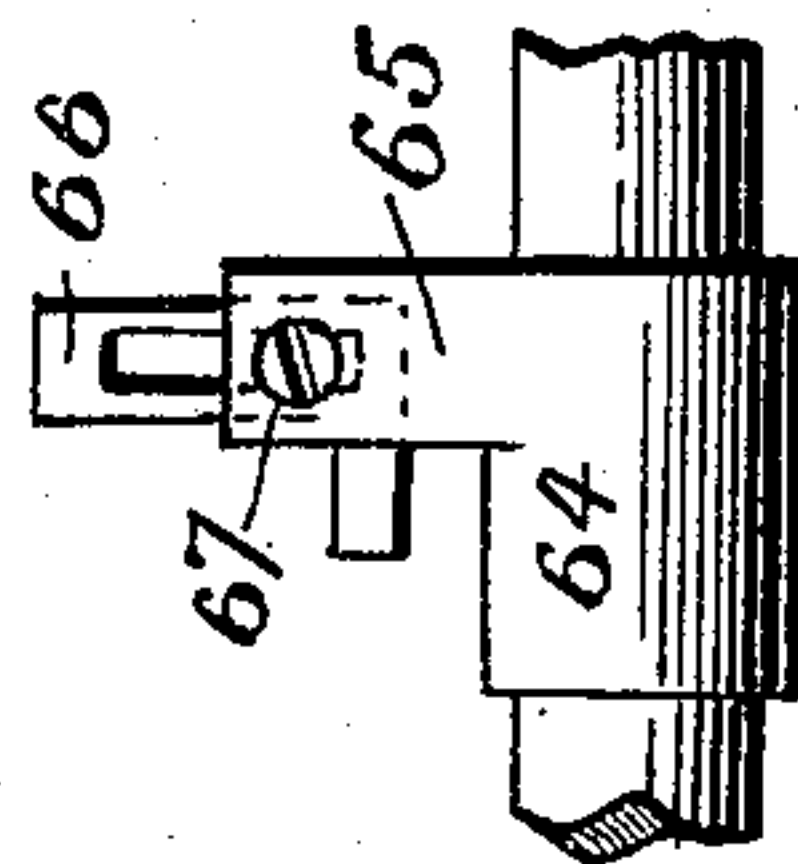
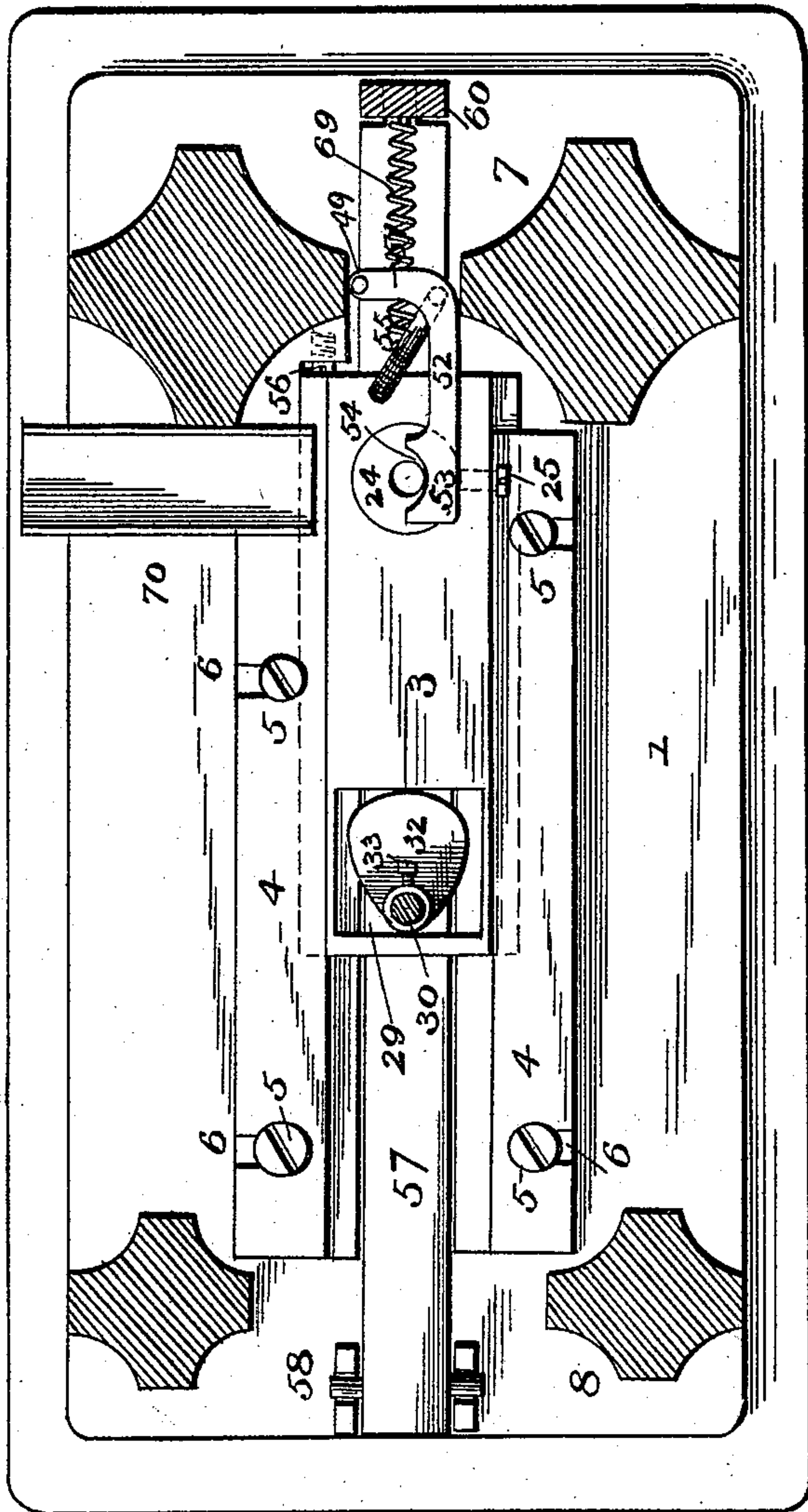


Fig. 5.

Witnesses  
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# UNITED STATES PATENT OFFICE.

FRANK W. JORDAN, OF TACONY, PENNSYLVANIA.

## MACHINE FOR COMPRESSING TABLETS.

SPECIFICATION forming part of Letters Patent No. 438,763, dated October 21, 1890.

Application filed February 12 1890. Serial No. 340,231. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK W. JORDAN, a citizen of the United States, residing at Tacony, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Machine for Compressing Tablets, of which the following is a specification.

This invention relates to machines for manufacturing compressed tablets intended mainly for medicinal purposes; and it has for its object to construct a machine of this class designed especially for the use of retail druggists, and which shall therefore be simple, inexpensive, and easily manipulated, and which shall be perfectly accurate in its measurements, so as to be available for compressing drugs in small quantities, such as may be prescribed by physicians, as well as for limited manufacturing purposes.

My invention, with these ends in view, consists in the improved construction, arrangement, and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, Figure 1 is a side elevation, partly in section, of my improved tablet-machine. Fig. 2 is a vertical transverse sectional view taken on the line  $x$   $x$  in Fig. 1. Fig. 3 is a vertical transverse sectional view taken on the line  $y$   $y$  in Fig. 1. Fig. 4 is a horizontal sectional view taken on the line  $z$   $z$  in Fig. 1. Fig. 5 is a detail view of one end of the main shaft, having the collar 64 and adjacent parts.

Like numerals of reference indicate like parts in all the figures.

The base of the machine, which is designated by 1, is provided with a pair of longitudinal parallel flanges 2 2, which constitute the foundation upon which the movable bed 3 of the machine rests, said bed being guided between the cleats or flanges 4 4, which are secured adjustably upon the foundation-flanges by means of set-screws 5, passing through slots 6 in the said cleats. From the base rise the front and rear uprights 7 and 8, both of which, but especially the latter, should be made quite heavy and strong in order to be able to resist the pressure to which it will in practice be subjected. The upper ends of the said uprights are provided with bearings

for the longitudinal main shaft 9, which is held removably by a detachable cap 10, which is firmly connected to the front upright by means of bolts 11.

Upon the rear side of the front upright are formed vertical guideways for a vertically-movable cross-head 12, the upper side of which has a socket 13 to receive the head 14, formed upon the lower end of a pitman 15, with which it is in this manner connected. The upper end of said pitman has an eye or strap 16, whereby it is connected with a crank or eccentric 17 upon the main shaft 9, from which it receives motion. It will be seen that the connection of the cross-head or plunger 12 with the pitman 15 is without the use of pins or bolts, and that consequently very great pressure may be exerted without danger of breakage.

Screwed detachably into the under side of the cross-head 12 or socketed therein and secured by means of a set-screw is the upper die 18, which is made slightly tapering, as shown, so as to avoid danger of binding in the mold, and having a concave face. The lower die 19, which is similarly constructed, is likewise secured detachably in a frame 21, having upwardly-extending guide-pins 22, that extend into perforations 23 in the movable bed 3 of the machine.

24 designates the mold or cylinder, which is secured detachably in the bed 3 by means of a set-screw 25, engaging a slot 26 in the said cylinder, which is thereby secured very firmly in position. The said mold or cylinder is perforated to receive the upper and lower dies, and the latter, as well as the cylinder, being mounted detachably it will be seen that they may be readily removed when desired and others of a different size or shape substituted. The frame-plate 21 is provided with laterally-extending pins 27 to receive the impact of a flat bifurcated spring 28, secured upon the under side of the bed 3, for the purpose of forcing the said frame and the lower die carried thereby normally in a downward direction.

The bed-plate 3 is provided with a slot 29 for the passage of a vertical shaft 30, the lower end of which is journaled in the base 1 and the upper end of which has a bearing in



an arm or bracket 31, extending from the upright 8. Said shaft has a cam 32, secured adjustably thereon by a set-screw 33, and which works in a slot or recess in the bed-plate 3, to which latter a longitudinal reciprocating motion may thus be imparted. The upper end of the shaft 30 has a bevel-gear 34, meshing with a bevel-gear 35 upon the main shaft 9, said bevel-gears being held by means of set-screws 36, passing through collars 37 formed thereon. The collar 37 of the bevel-gear 34 is provided with an annular groove 38, from which a band 39 passes over a pulley 40 at the upper end of a shaft 41, arranged vertically in the feed-can 42, the bottom of which latter is provided with a gudgeon 43 to form a bearing for the lower end of said shaft. The upper end of the latter is journaled detachably in a bearing formed at the outer end of the arm 31, which is provided with a hinged cap 44, which may be held closed by a thumb-screw 45. The lower end of the shaft 41 is provided with a series of spirally-curved radial wings 46, that serve to agitate and loosen the contents of the feed-can and cause it to escape through a slot 47 in the bottom of said can. The side of the latter is inclined, as shown at 48, in order that its contents shall be naturally guided to the escape slot or opening in the bottom thereof.

The standard or upright 7 of the frame of the machine has a lug 49, on which is pivoted an L-shaped arm 50, the function of which is to sweep the finished tablet off the bed 3. Said arm is pivoted at the end of its short arm 51. At the end of its long arm 52 it has a head 53, provided with a curved notch or recess 54 to engage the tablet, and the angle of said arm is connected by a link 55 with the upper side of the movable bed 3. The extent of the movement of the latter in a forward direction may be limited and accurately gaged by means of a set-screw 56, adjusted in the frame of the machine, thereby enabling the movement of said bed in a forward direction to be stopped precisely at the point where the mold or cylinder of the machine is in alignment with and adapted to receive the upper die.

57 designates a lever or pedal which is mounted pivotally at 58 near the rear end of the base and extends between the flanges 2 and under the movable bed 3 to the front end of the base, it being provided with a slot 59 for the passage of the shaft 30. This pedal, which is slightly bent, as shown, so as to enable its front end to rest level upon the base, supports the frame 21, carrying the lower die, and its front end is suitably connected with the lower end of a vertically-reciprocating lifter 60, for which guideways or bearings are provided upon the front upright of the machine. The upper end of the lifter 60 terminates in a frame 61, in which works a cam 62, which is secured by a set-screw 63 upon the main shaft of the machine. The collar 64 of

the cam 62 is provided with a radially-extending arm 65, which is slotted to receive an extension-arm 66, which may be secured adjustably therein by a thumb-screw 67, and which carries a cam-section 68, adapted to engage the frame 61 at the upper end of the lifter 60. The cam-section 68 may be adjusted to receive the frame 61 as the latter passes out of engagement with the cam 62, and thereby to regulate the extent to which the lifter 60 and the front end of the pedal 57 shall be permitted to descend while the movable bed 3 of the machine is in the position at which the mold or cylinder receives the contents of the feed-can. The position of the bottom die in the mold being thus regulated, it follows that the quantity of material supplied to the mold may be very accurately gaged.

69 designates a spiral spring suitably attached to the lifter 60 and to the front end of the movable bed 3 to hold the latter in contact with the gage-screw 56.

A trough or chute 70, to carry the finished tablets off to some suitable receptacle as they are being pushed off the bed 3 by the pivoted arm 50, is attached to the base of the machine. The front end of the main shaft is to be provided with a hand-wheel 71 or with a band-wheel or other suitable means for receiving motion from any convenient source of power.

The operation of my invention is as follows: The material which is to be compressed into tablets is placed in the feed-can or hopper 42 and power is applied to the main shaft 9. The vertical counter-shaft 30, having the cam 32, will first operate to move the bed-plate 3 in a rearward direction upon the base of the machine until the mold or cylinder comes under the slot in the bottom of the hopper. The contents of the latter, being agitated by the spiral-wings upon the rotary shaft 41, will fill the mold, in which the bottom die is meanwhile held in a properly-gaged position by means of the pedal 57 and the operating mechanism of the latter. The bed-plate 3 will next be moved by the cam 32 in a forward direction until the mold or cylinder comes into alignment with the upper die. The latter now descends and compresses the tablet, the frame carrying the bottom die resting meanwhile upon that portion of the pedal 57 which is lying smoothly or level upon the base. The cam 62 at the front end of the main shaft next comes into play and moves the lifter 60 in an upward direction, thus elevating the front end of the pedal 57 and the frame carrying the bottom die, which is thus caused to eject the finished tablet, the upper die meanwhile receding in an upward direction. The lifting-frame now slides off the cam 62 and onto the cam-section 68, which supports it and the pedal in the properly-gaged position to support the frame carrying the lower die, which is forced downward upon the pedal by the ac-



tion of the spring 28. When the bed 3, actuated by the cam 32, again moves in a rearward direction upon the base, the arm 50, actuated by the link 55, sweeps the finished tablet onto the trough or chute 70.

My improved tablet-compressing machine is, as will be seen from the foregoing description, simple in construction and very compactly and at the same time comparatively lightly built, so that while it is quite as efficient in operation as more complicated machines it may be manufactured at a cost that places it within the reach of the retail trade. The capacity of the machine may be increased by providing it with several sets of dies instead of with only a single set, as herein shown and described. The structural changes necessary to accomplish this result would be readily understood by the skilled mechanic and do not require to be enlarged upon. At the same time I desire it to be understood that I reserve the right to this and to any other changes and modifications in the construction of the machine which may be resorted to without departing from the spirit of my invention.

Having thus described my invention, what I claim is—

1. The combination, with the laterally-reciprocating bed having the mold or cylinder, of the vertically-movable frame having guide-pins extending into perforations in the bed and carrying the lower die and the pedal supporting said vertically-movable frame, substantially as set forth.

2. The combination of the laterally-reciprocating bed-plate, the vertically-movable frame having guide-pins extending into perforations in the bed-plate and carrying the lower die, the pedal supporting said frame, a spring attached to the bed-plate and serving to force the said frame normally in a downward direction, and mechanism for operating the pedal, substantially as set forth.

3. The combination, with the laterally-reciprocating bed-plate, of the vertically-movable frame having guide-pins extending into perforations in the bed-plate and carrying the bottom die, the spring to force said frame in a downward direction, the pedal supporting the said frame, and mechanism for operating and for regulating the extent of the movement of said pedal, substantially as set forth.

4. The combination, with the laterally-reciprocating bed-plate and the vertically-movable frame carrying the bottom die, of the pedal supporting the said frame, said pedal being bent to enable its front end to rest level upon the base, while the frame carrying the bottom die is supported in operative position, substantially as set forth.

5. The combination of the laterally-reciprocating bed-plate carrying the mold or cylinder, the vertically-movable frame carrying the bottom die, the vertically-reciprocating cross-head carrying the upper die, a vertical rotating shaft having a cam engaging a re-

cess in the bed-plate to impart motion to the latter, and a gage-screw to regulate the extent of the movement of the bed-plate and to arrest the latter with the mold or cylinder in alignment with the upper die, substantially as set forth.

6. The combination of the base having longitudinal flanges, the reciprocating bed-plate mounted upon said flanges, the guide-cleats secured adjustably upon the latter, the pedal arranged between the flanges, and the frame supported upon the pedal and carrying the bottom die, substantially as and for the purpose set forth.

7. The combination of the base having the longitudinal flanges, the bed-plate mounted upon the latter, the guide-cleats secured adjustably upon said flanges, the vertically-movable frame carrying the lower die and having guide-pins extending into perforations in the bed-plate, a spring to force the said frame in a downward direction, and the pedal supporting said frame, substantially as set forth.

8. The combination, with the reciprocating bed-plate carrying the mold or cylinder, of the vertically-movable frame carrying the bottom die and having guide-pins extending into perforations in the bed-plate, pins or lugs extending laterally from said frame, and a flat bifurcated spring secured to the under side of the bed-plate and bearing downwardly upon the pins or lugs of the vertically-movable frame, substantially as set forth.

9. The combination, with the laterally-reciprocating bed-plate carrying the mold or cylinder and the vertically-movable frame carrying the bottom die, of the ejecting mechanism for forcing the said frame in an upward direction after the formation of the tablet, and angular or L-shaped arm pivoted to the frame of the machine, resting loosely upon the bed-plate, and connected with the latter by means of a pivoted link, substantially as set forth.

10. The combination, with the reciprocating bed-plate, of the angular or L-shaped arm connected pivotally to the frame of the machine and having a head provided with a curved notch or recess, and a link pivotally connecting the angle of said arm with the reciprocating bed-plate, substantially as set forth.

11. The combination, with the reciprocating bed-plate having the mold or cylinder and the vertically-movable frame carrying the bottom die, of the pedal supporting said frame, the longitudinally-arranged main shaft, a vertically-reciprocating lifter suitably connected with the free end of the pedal and having a frame at its upper end, and a cam secured upon the main shaft and working in said frame, substantially as set forth.

12. The combination, with the pedal supporting the lower die-carrying frame, of the lifter terminating in a frame at its upper end, a cam mounted upon the main shaft, engaging

said frame, and having an outwardly-extending slotted arm, and an extension-arm mounted adjustably in the latter and having a cam-section adapted to receive the lifter-frame  
5 when the latter slides off the main operating-cam, substantially as and for the purpose set forth.

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

FRANK W. JORDAN.

Witnesses:

WM. MILLER,

JNO. S. MAKIN.