

No. 821,283.

PATENTED MAY 22, 1906.

R. DARIO.

LOCK.

APPLICATION FILED JUNE 17, 1905.

3 SHEETS—SHEET 1.

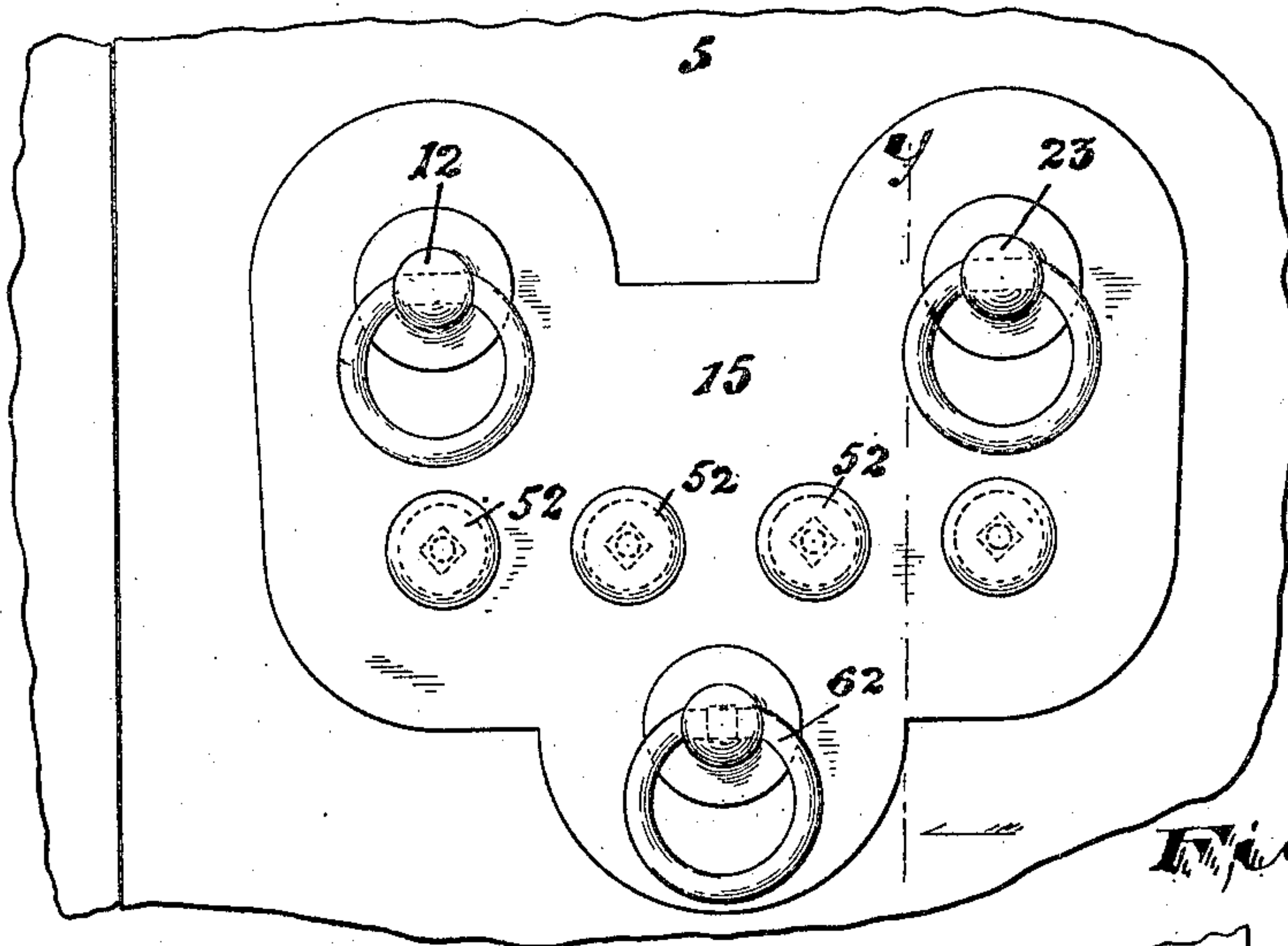


Fig. 1.

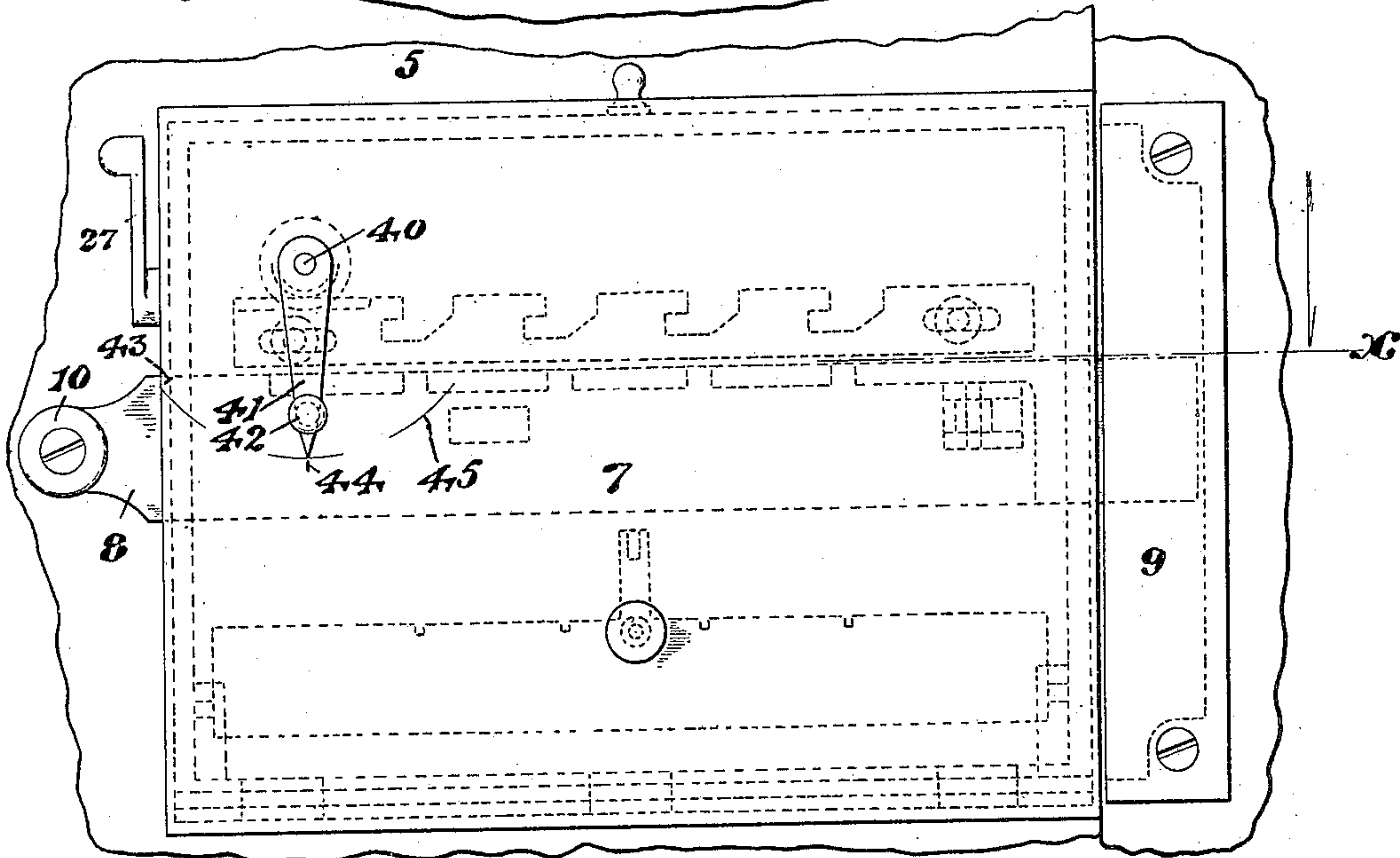


Fig. 2.

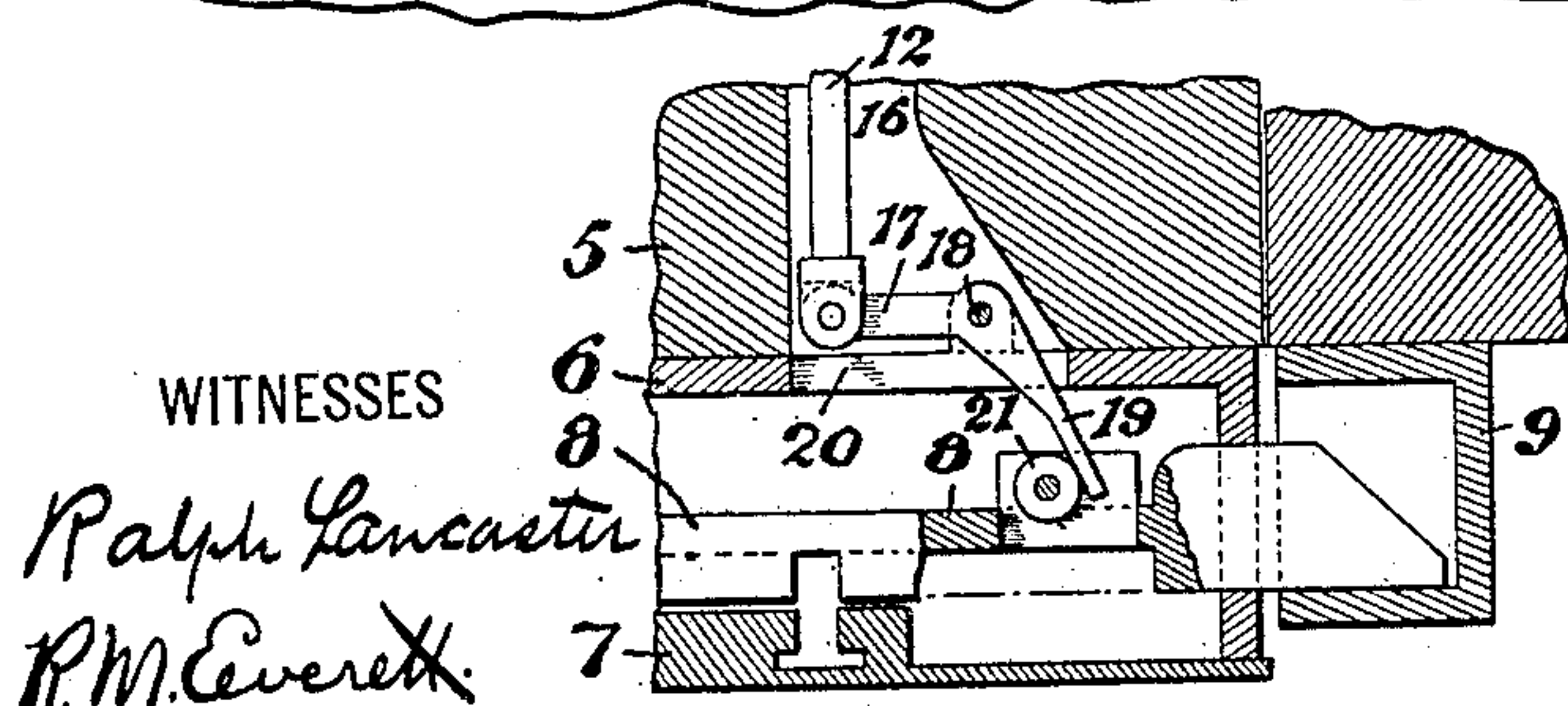


Fig. 3.

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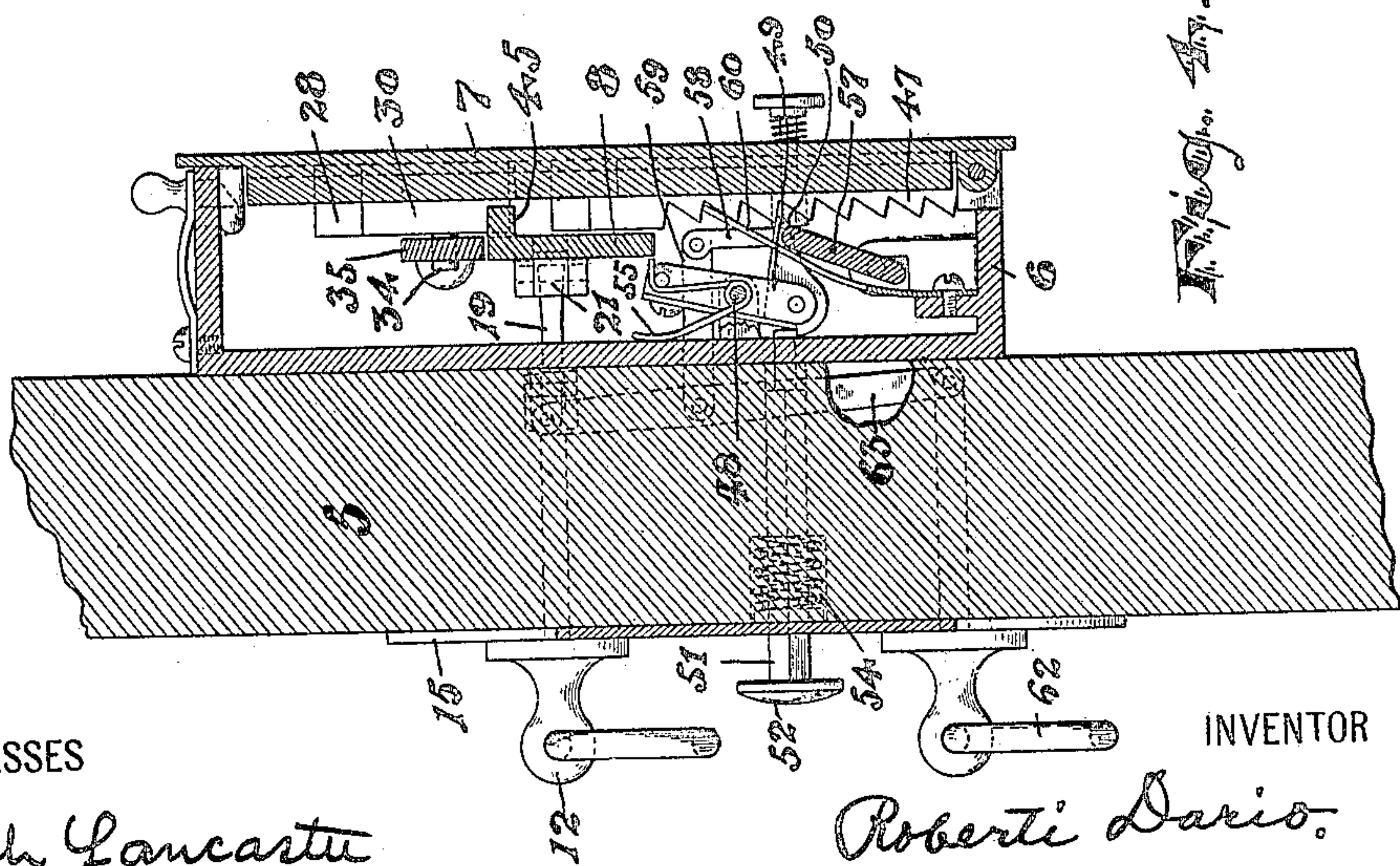
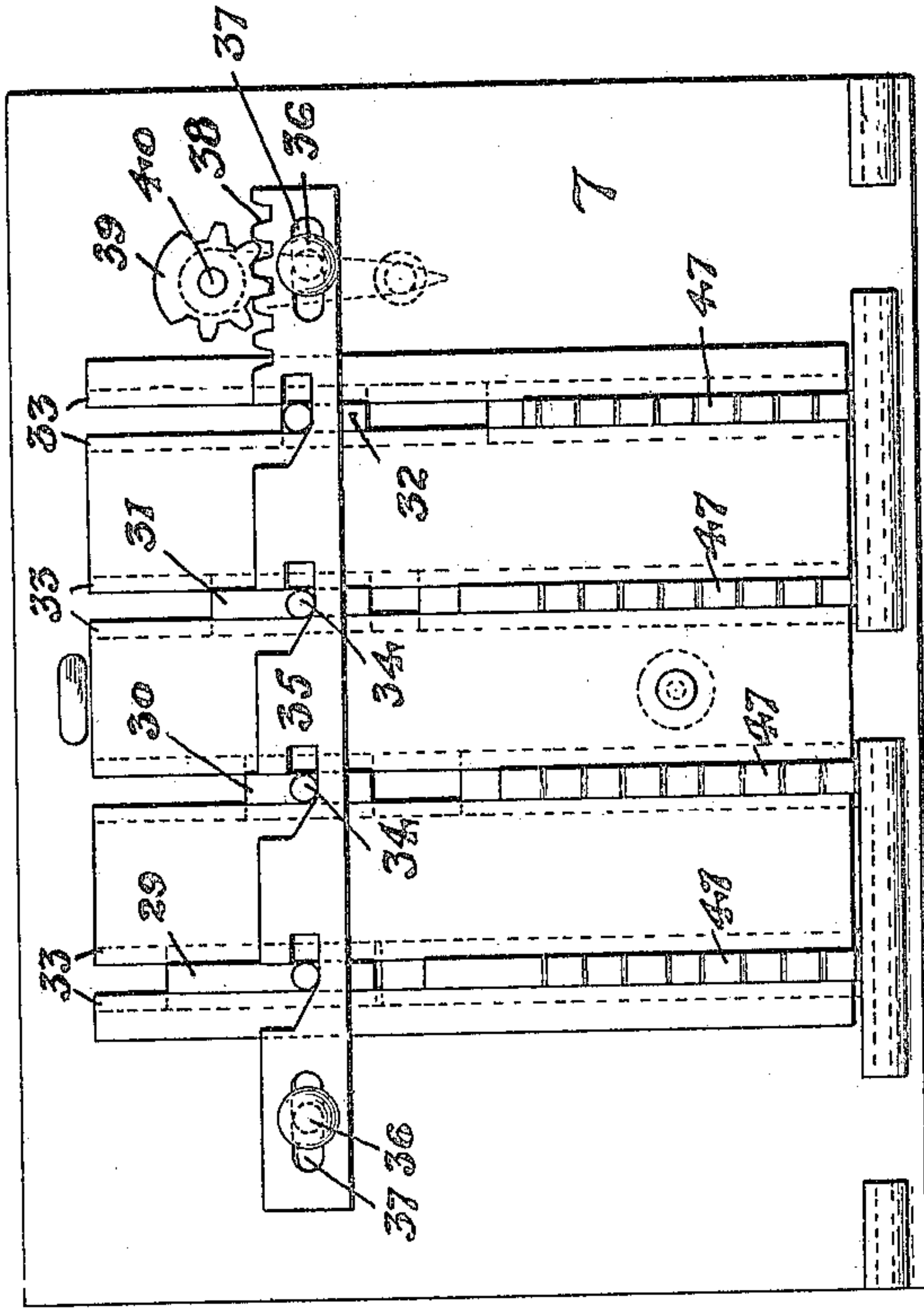
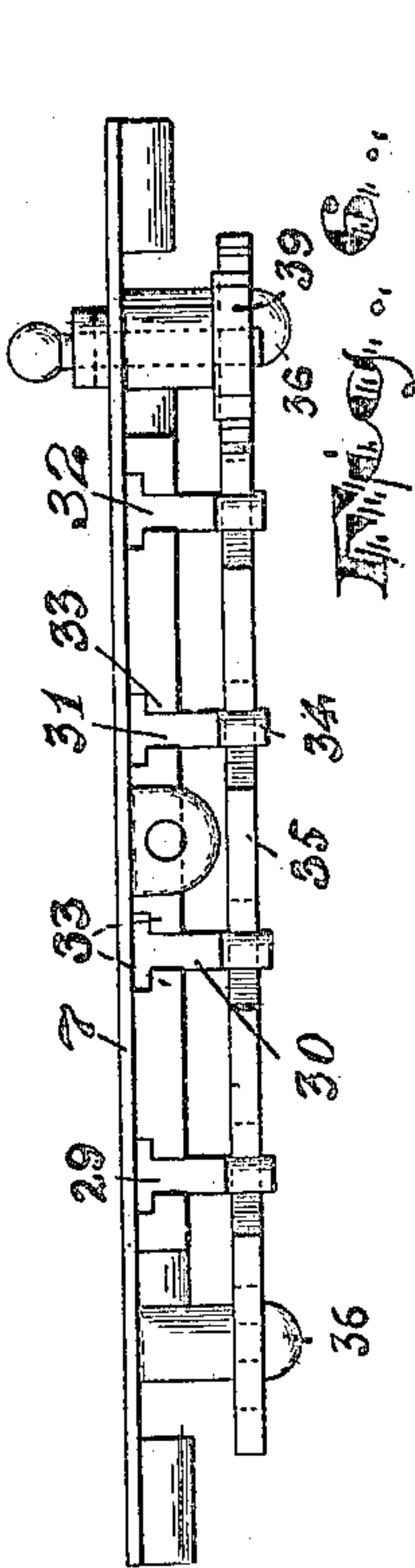
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3 SHEETS—SHEET 2.



WITNESSES

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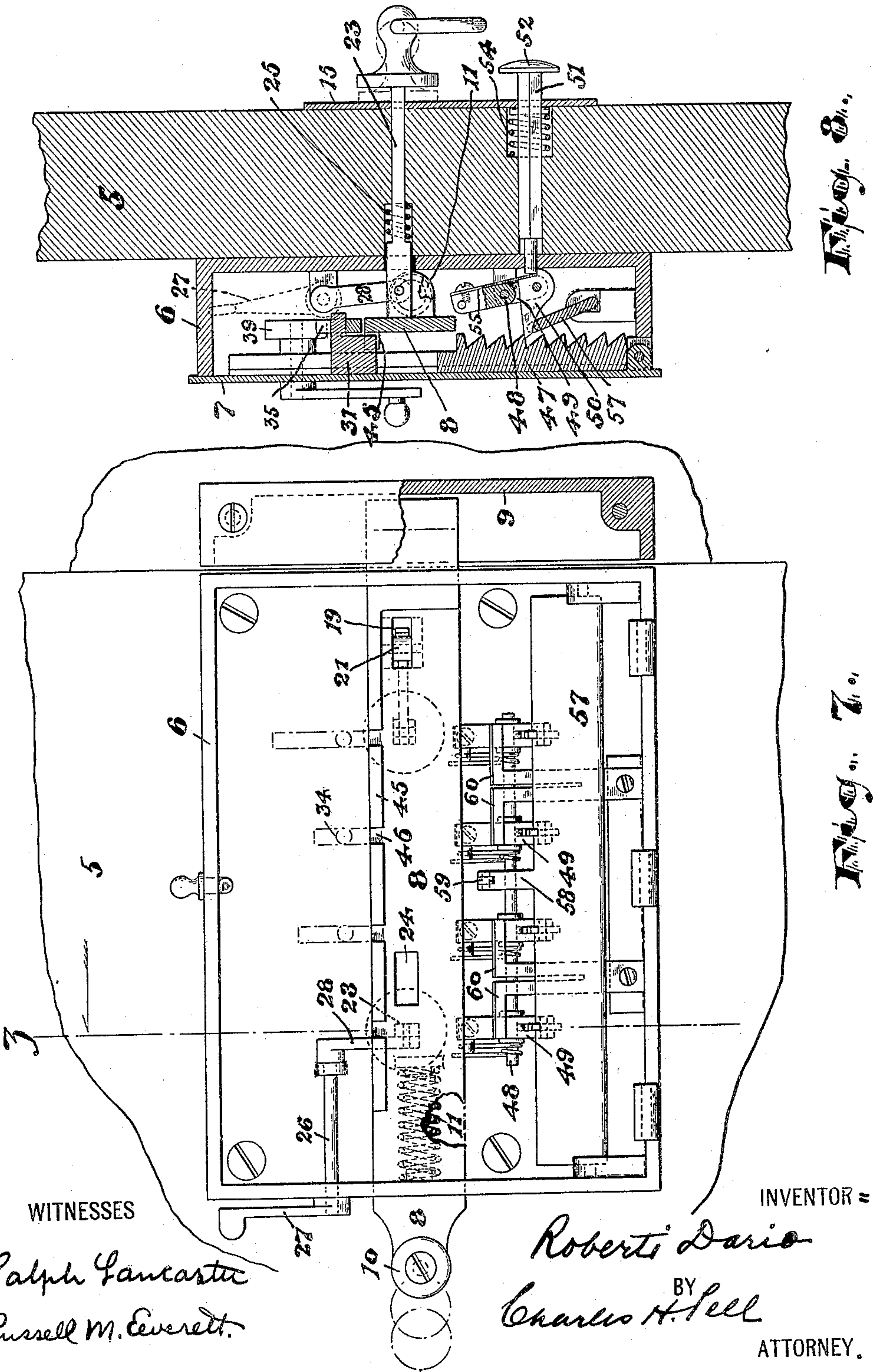
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3 SHEETS—SHEET 3.



WITNESSES

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# UNITED STATES PATENT OFFICE.

ROBERTI DARIO, OF NEWARK, NEW JERSEY.

## LOCK.

No. 821,283.

Specification of Letters Patent.

Patented May 22, 1906.

Application filed June 17, 1905. Serial No. 265,748.

*To all whom it may concern:*

Be it known that I, ROBERTI DARIO, a subject of the King of Italy, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Locks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such 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, and to numerals of reference marked thereon, which form a part of this specification.

The objects of this invention are to obtain a more secure locking of a door, to prevent an unlocking except by one acquainted with the "combination" governing the unlocking operation, to enable a combination-controlled lock to be provided at a limited cost of construction and one which will be durable and efficient, and to secure other advantages and results, some of which will be hereinafter referred to in connection with the description of the working parts.

The invention consists in the improved combination-lock for doors, and more particularly house-doors, and in the arrangements and combinations of parts of the same, all substantially as will be hereinafter set forth and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like numerals of reference indicate corresponding parts in each of the several figures, Figure 1 is an elevation of the outside of a portion of a door to which my improved lock has been applied. Fig. 2 is an inside view of the same. Fig. 3 is a detail section taken at line *x* of Fig. 2. Fig. 4 is a vertical section taken at line *y* of Fig. 1. Fig. 5 is an inside face view of a removable plate on the inside part of the lock and the parts affixed thereto. Fig. 6 is a top view of the same. Fig. 7 is an elevation showing the casing with the plate removed, showing the contents of it; and Fig. 8 is a vertical section taken at line *z* of Fig. 7, showing the removable plate and devices carried thereby in position.

In said drawings, 5 indicates the door to which my improved device has been applied. 6 is a box-like casing adapted to be applied to the inside of said door by screws or other suitable means, and 7 is the removable cover-plate for said casing. Within said box-like casing is arranged the latch-bolt 8, which is horizontally disposed in bearings in said casing

and at one end is beveled and adapted to enter the nosing 9. Said latch-bolt at its opposite end from that engaging the nosing 9 projects out from the casing 6 and is provided with a finger portion or handle 10, by means of which said latch-bolt can be drawn back from the nosing by hand. A spring 11 within said casing serves normally to throw said latch-bolt into locking engagement with the nosing. From the outside of the door said bolt is operable by handled bolt 12, (shown more clearly in Figs. 1, 3, and 4,) said bolt serving to draw the bolt back by power applied after said bolt has been released, so as to be free to slide from the nosing. Said handled bolt 12 has a bearing in the front plate 15, attached to the front of the door, and extends through a boring or aperture 16 in the door 5 to a bell-crank lever 17, fulcrumed at 18 upon the lock-casing 6, as shown in Fig. 3, where it is connected to said bell-crank. Said bell-crank has a lever-arm 19, which extends through a perforation or opening 20 in the casing and engages the latch-bolt 8 to force the same backward, said bolt being preferably provided with a roller-bearing 21 to reduce friction. When said latch-bolt 8 is forced back from the nosing by the handled bolt 12 or by the finger-piece 10, another handled bolt, which we may term a "stop-bolt" 23, arranged to slide in the outside plate 15 and which extends through a boring or aperture in the door 5, enters a perforation 24, Fig. 7, said stop-bolt being forced into such perforation automatically by a spring 25, which serves to lock said bolt in its unfastened relation. This said bolt can be released from its catching or locking relation to the latch-bolt 8 from the inside of the door 5 by means of a handled lever 26, the arm 27 of which lies outside of said lock-case and the arm 28 of which extends and is pivotally pinned to the inner end of said stop-bolt 23, as shown in Figs. 7 and 8. To lock said bolt in its position of engagement with the nosing, I employ a series of tumblers 29 30 31 32 of varying lengths, carried in slideways 33, fastened or formed on the inside of the cover-plate 7, as shown more clearly in Figs. 5 and 6, said tumblers being preferably T-shaped in cross-section and working in correspondingly-shaped slots between the slideways. Said tumblers have inwardly-projecting pintles or lugs 34, which latter are adapted to engage a sliding tumbler locking and releasing bar 35, carried on bearings 36 36 on the in-



side of the cover-plate, said bar 35 being slotted, as at 37 37, to permit of a limited horizontal movement of said plate, as hereinafter described. Said bar at one end is toothed to form a rack 38, adapted to engage a pinion 39, by means of which said rack and bar can be reciprocally operated from the inside of the door. Said pinion is fastened on a shaft or arbor 40, having its bearings in the cover-plate and having exposed for hand manipulation an index or pointer crank 41, having the handle 42. Said crank 41 may thus be changed in its position by hand to accord with marks 43 44 45 on the outside of the cover-plate to force the pinion and rack and bar 35 to the positions hereinafter described, at which the tumblers are either locked in their latch-locking positions, are free to be operated from the outside by means hereinafter described, or are thrown upward out of engagement with said latch-bolt, and are thus inoperative so far as the latch-locking operations are concerned. Said tumblers are adapted to drop by gravity into locking relation with the latch-bolt, the latter being provided with a notched flange 45, adapted to lie underneath the bar 35, the notches coinciding with the slideways 33. When the tumblers have entered notches 46 of the latch-bolt, the latter is prevented from sliding horizontally or longitudinally on its bearings, as will be evident.

Within the slots or slideways 33 are also arranged below the tumblers 29 30 31 32 ratcheted slides 47, each of which is adapted to be forced upward in its slot to engage a tumbler to force the same out of locking engagement with the latch-bolt. Said tumbler-operating slides 47 are engaged by pawls 50, which are pivoted on the levers 49, these levers being fulcrumed on a shaft or shafts 48, having bearings on the casing. Thus when one of said levers 49 is pressed by a push-piece 51, extending through the door 5, from the outside and at said outside being provided with a finger-piece or button 52 the pawl or arm 50 is thrown upward and with it the ratcheted slide, and the last engages one of the tumblers to force it upward out of engagement with the latch-bolt. Springs 54 hold the push-pieces 51 in normally outward positions, and springs 55 hold the pivoted pawls in engagement with the ratchet-teeth, but permit a sliding thereon. A plate 57, pivoted at opposite ends and between said ends provided with an arm 58 in connection with a link 59, extending toward the outside of the door, enables all the pawls to be raised out of engagement with their respective ratcheted slides. Springs 60 serve to engage and hold the sliding ratchets from falling as the pawls are moving downward to engage the lower teeth. Said springs are also thrown out of engagement by the pivoted plate 57 and its connections. A link 59 for operating

the plate 57 may be operated by the handle 62 at the front plate 15 through the medium of a lever 63 or in any suitable manner.

In operating the device to open the locked door the handle 62 may be first pulled to bring the ratcheted slides to their initial or lowest positions. Then the push-pieces 52 are pressed to operate the pawls and by step-by-step movements raise the ratchet-slides to their limits and the variously-sized tumblers to the limits at which they are disengaged from the latch-bolt in accordance with the combination of the lock, after which the latch-bolt is withdrawn from the nosing, as heretofore described.

Having thus described the invention, what I claim as new is—

1. The improved door-lock herein described, comprising a casing, adapted to be attached to the door, containing a latch-bolt, said bolt being arranged horizontally in bearings of said casing and at one end being beveled and at the opposite end provided with a handle, a spring within said casing to throw the bolt into engagement with a nosing, a handled bolt adapted to be operated from the outside of the door, a lever for transmitting motion from said handled bolt to said latch-bolt for drawing the latter when released back from the nosing, a series of tumblers adapted to lock said latch-bolt, a series of independent devices for operating the respective tumblers, said devices having manually-operated connections adapted to be operated at the outside of the door, substantially as set forth.

2. The improved door-lock herein described, comprising a casing, adapted to be attached to the door, containing a latch-bolt having notches, a series of tumblers disposed to enter said notches and lock said latch-bolt, ratcheted slides to operate the tumblers, pawls to operate said ratcheted slides and release said tumblers from the latch-bolt and manually-operated connections adapted to lie at the outside of the door and adapted to independently operate the tumblers, substantially as set forth.

3. The improved door-lock herein described, comprising a casing, adapted to be attached to the door, containing a latch-bolt having notches, a series of tumblers disposed to enter said notches and lock said latch-bolt, ratcheted slides to operate the tumblers, pawls to operate said ratcheted slides and release said tumblers from the latch-bolt, and manually-operated connections adapted to lie at the outside of the door and adapted to independently operate the tumblers, and springs holding said ratcheted slides while the pawl makes return movements, substantially as set forth.

4. The improved door-lock herein described, comprising a casing, adapted to be attached to the door, containing a latch-bolt



having notches, a series of tumblers disposed to enter said notches and lock said latch-bolt, ratcheted slides to operate the tumblers, pawls to operate said ratcheted slides and release said tumblers from the latch-bolt and manually-operated connections adapted to lie at the outside of the door and adapted to independently operate the tumblers, and means for holding said latch-bolt in its unlocking position, the last said means being operable from the outside of the door.

5. The improved door-lock herein described, comprising a casing, adapted to be attached to the door, containing a latch-bolt longer than said casing and at one end having an exposed handle and at the opposite end adapted to engage a nosing, said latch-bolt having a series of tumbler-notches, means for throwing said latch-bolt longitudinally to its unlatched position, said means being operable from the outside of the door, a series of tumblers adapted to lock said latch-bolt, a series of independent devices for operating the respective tumblers, said devices having manually-operated connections adapted to be operated at the outside of the door, substantially as set forth.

6. The combination with the box-like casing having slideways, of a notched latch-bolt and means for moving the same by hand and a spring to give return movement to said latch-bolt, a manually-operated bolt cooperating to draw the latch-bolt back from the outside of the door, a bell-crank lever having an arm engaging the latch-bolt and operated by said manually-operated bolt, a stop-bolt adapted to hold said latch-bolt in its unfastened relation, a series of tumblers of varying lengths carried in suitable slideways of the casing, a sliding tumbler locking and releasing bar, said bar being slotted and having means in its slots to limit the movement of said bar, said bar being toothed at one end, a pinion engaging the toothed part and a shaft or arbor for operating said pinion, ratcheted

slides to engage the tumblers, pawls to engage said slides and means for operating said pawls from the outside of the door, springs serving to prevent the ratcheted slides from falling, and a pivoted plate and means for operating the same from the front of the door to bring the ratcheted slides to their initial positions, substantially as set forth.

7. The combination with the box-like casing having slideways, of a notched latch-bolt and means for moving the same by hand and a spring to give return movement to said latch-bolt, a manually-operated bolt cooperating to draw the bolt back from the outside of the door, a bell-crank lever having an arm engaging the latch-bolt and operated by said manually-operated bolt, a stop-bolt adapted to hold said latch-bolt in its unfastened relation, a series of tumblers of varying lengths carried in suitable slideways of the casing, a sliding tumbler locking and releasing bar, said bar being slotted and having means in the slots to limit the movement of said bar, said bar being toothed at one end, a pinion engaging the toothed part and a shaft or arbor for operating said pinion, ratcheted slides to engage the tumblers, pawls to engage said slides and means for operating said pawls from the outside of the door, springs serving to prevent the ratcheted slides from falling, and a pivoted plate and means for operating the same from the front of the door to bring the ratcheted slides to their initial positions, said means comprising a link connection with the pivoted plate, a lever and manually-operated means for operating the lever.

In testimony that I claim the foregoing I have hereunto set my hand this 12th day of June, 1905.

ROBERTI DARIO.

Witnesses:

CHARLES H. PELL,  
LOUIS DE FRONZO.