

No. 674,043.

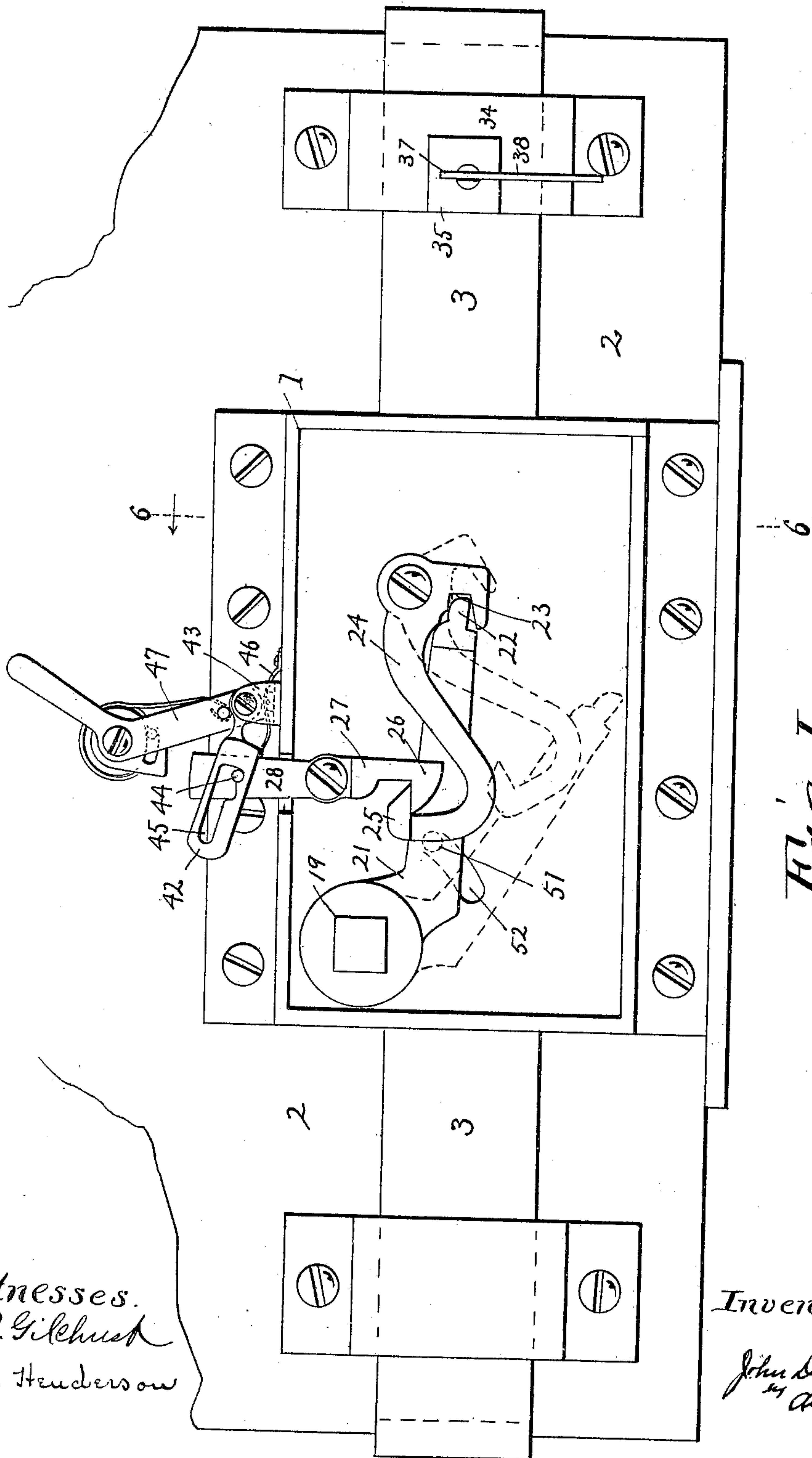
Patented May 14, 1901.

J. D. SPRING.
AUTOMATIC SAFE LOCK.

(Application filed June 19, 1899.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses.
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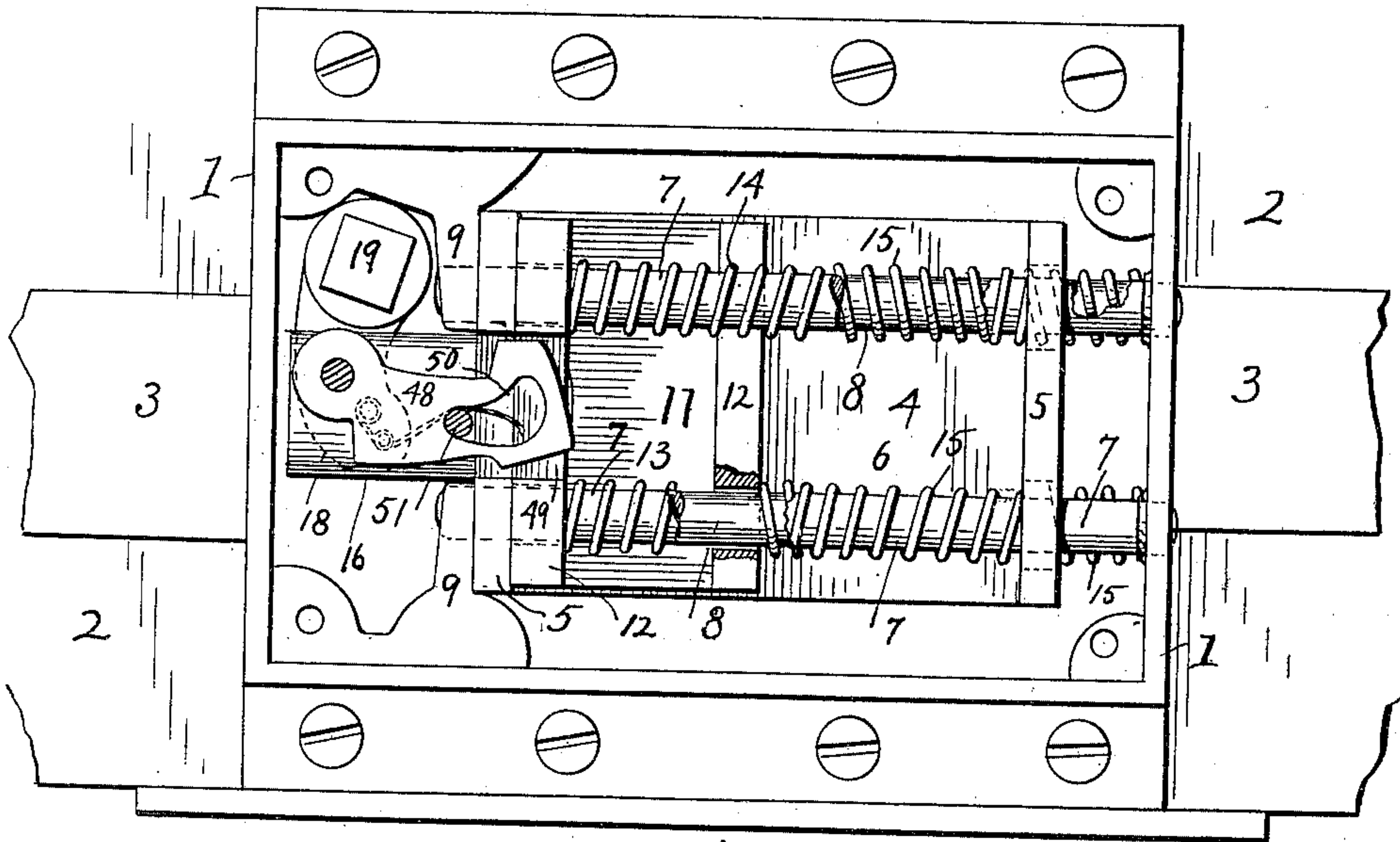


Fig. II,

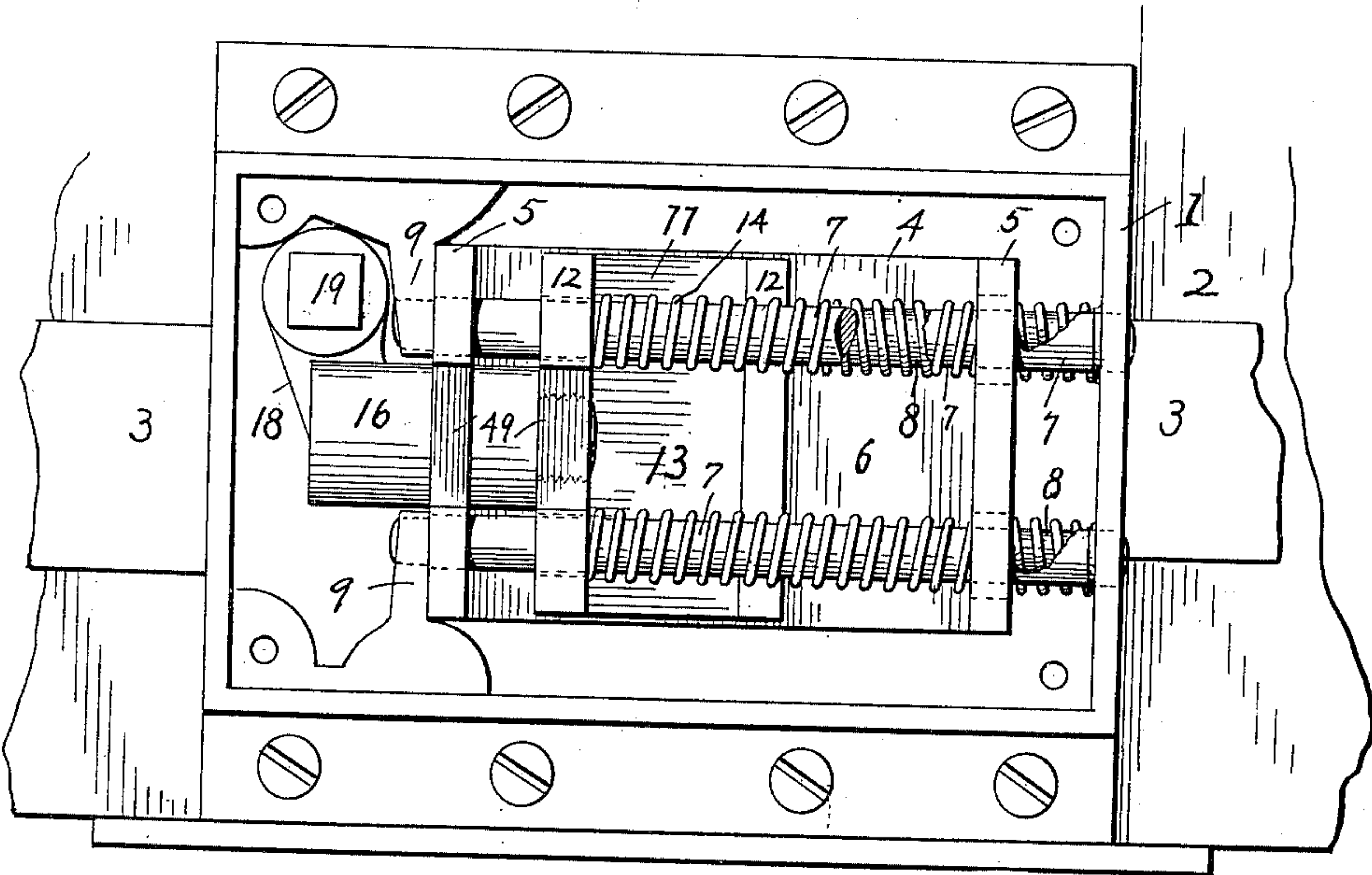


Fig. III,

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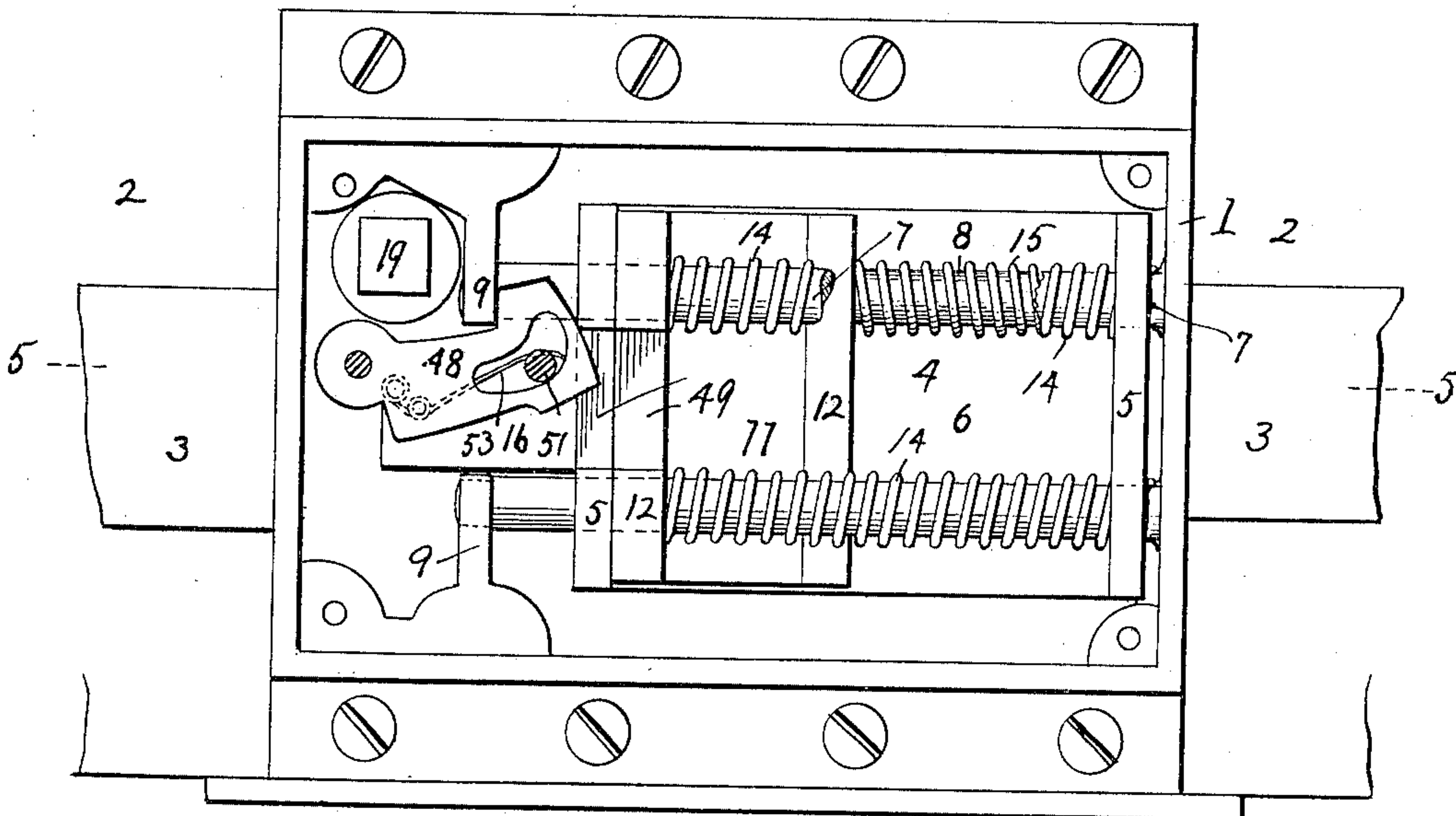


Fig. IV,

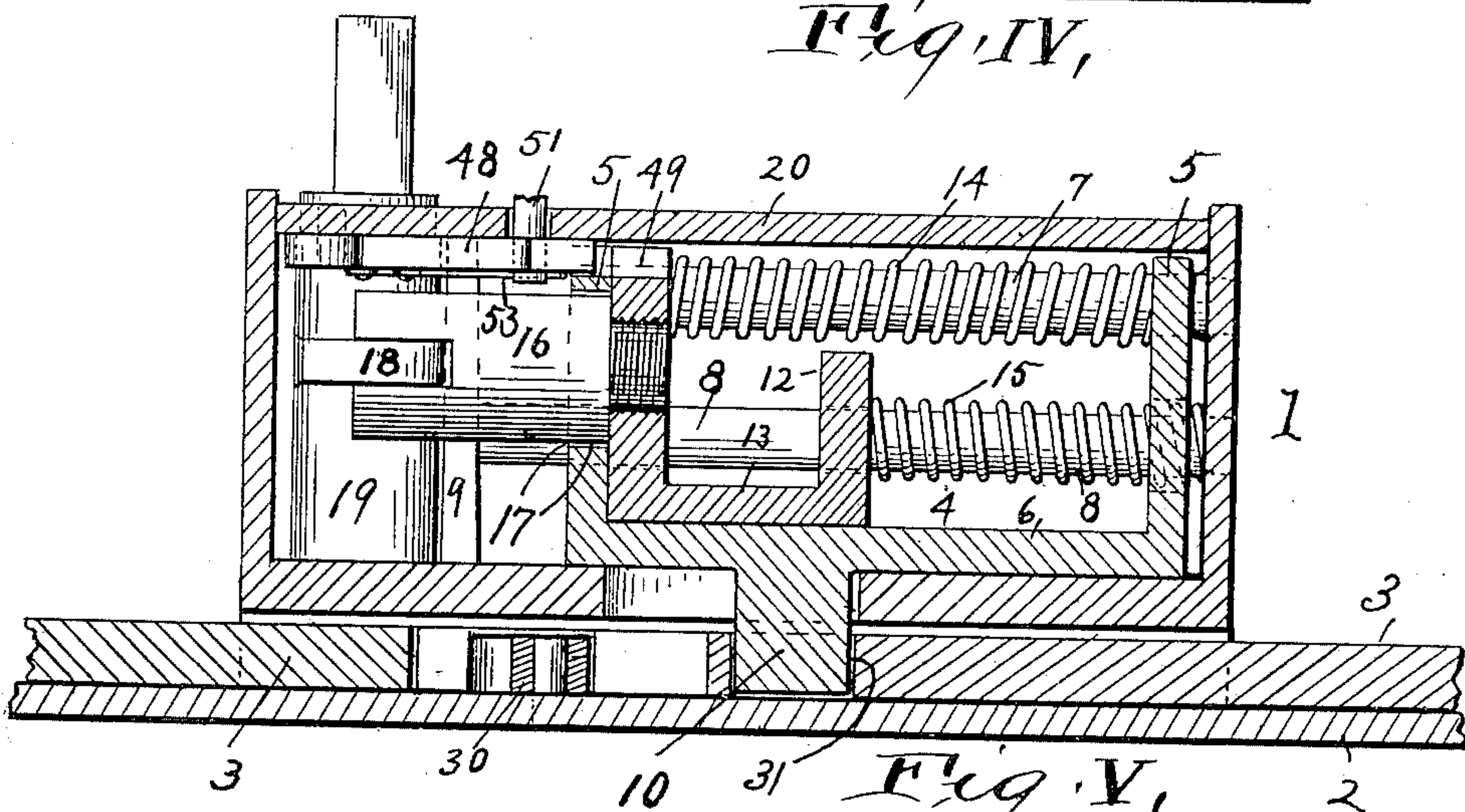


Fig. V,

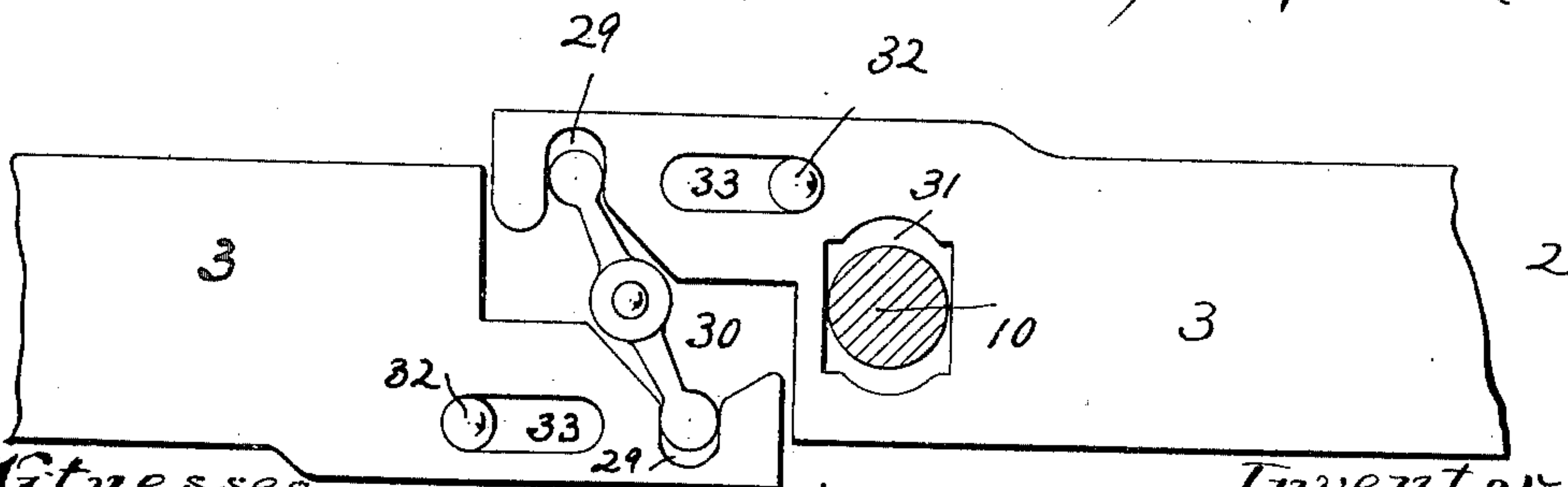


Fig. VII,

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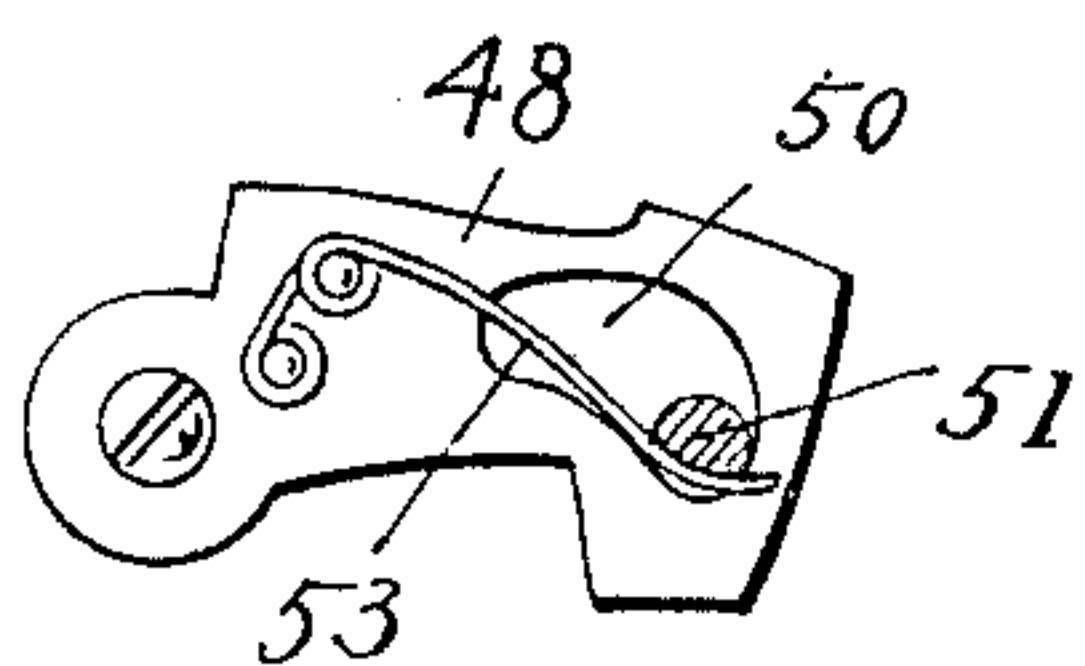
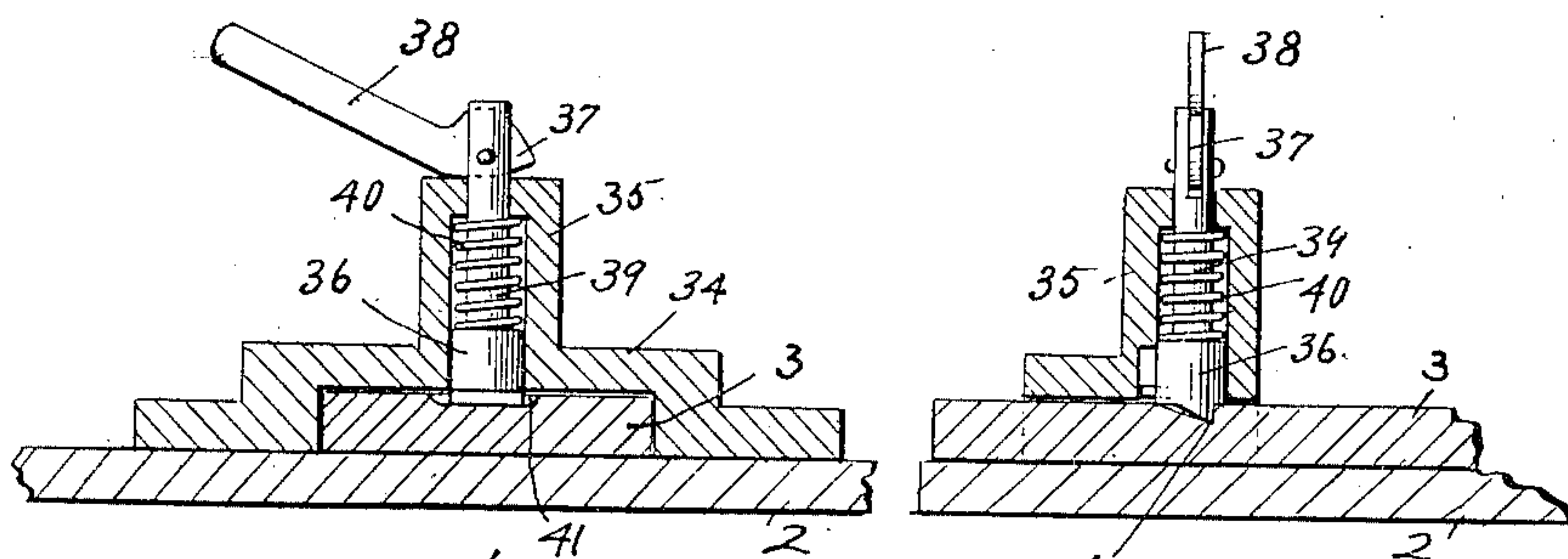
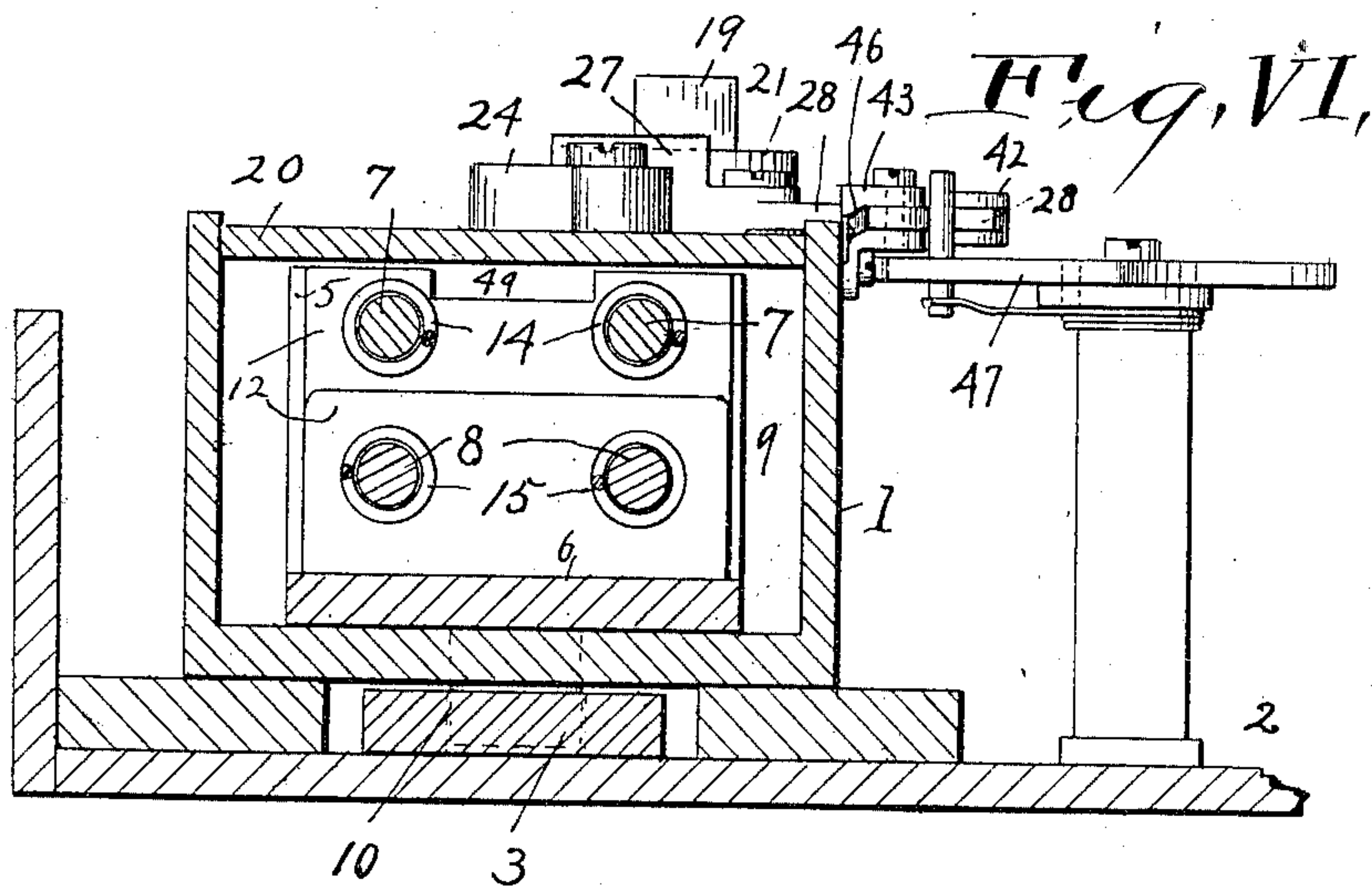
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(No Model.)

4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

JOHN D. SPRING, OF CLEVELAND, OHIO.

AUTOMATIC SAFE-LOCK.

SPECIFICATION forming part of Letters Patent No. 674,043, dated May 14, 1901.

Application filed June 19, 1899. Serial No. 721,027. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. SPRING, a citizen of the United States of America, residing at Cleveland, county of Cuyahoga, State of Ohio, have invented certain new and useful Improvements in Automatic Safe-Locks, of which the following is a specification.

The annexed drawings and the following description set forth in detail one construction embodying the invention, said detail mechanism constituting but one of various mechanical forms in which the principle of the invention may be used.

In the accompanying drawings, Figure I represents a view of my improved automatic safe-lock secured to the door of a safe, illustrating the levers in their operative and non-operative positions, the latter position being indicated by dotted lines. Fig. II represents a view with the top plate and levers removed, showing the mechanism in its non-operative position. Fig. III represents a similar view showing the position of the bolt-operating mechanism after the springs have been compressed and before the bolts have been cast. Fig. IV illustrates the position of the parts after the bolts have been cast. Fig. V represents a longitudinal cross-sectional view on the line 5 5 of Fig. IV. Fig. VI represents a vertical cross-sectional view on the line 6 6 of Fig. I. Fig. VII represents a view of the bolts in their non-operative position. Figs. VIII and IX represent sectional views of the bolt-trip. Fig. X represents a bottom plan view of the safety-detent.

The casing 1, that contains the bolt-operating mechanism, is secured to the safe-door 2 in suitable relation to the locking-bolt 3. A movable locking-frame 4, consisting of the end plates 5 and base-plate 6, is secured in the casing and is preferably movable upon the rods 7 7 and 8 8, that are arranged between one end of the casing and abutments 9, formed integral therewith. A stud 10 projects from the bottom of the frame and engages with one of the locking-bolts. An operating-frame 11, consisting, preferably, of the end plates 12 and bottom plate 13, is mounted within the locking-frame, upon the rods, and is movable thereon. A locking spring or springs 14 are arranged between the operating frame and the locking-frame, preferably

erably between one end of said operating-frame and the opposite end of the locking-frame, and are supported by the rods 7 7. A retracting spring or springs 15, supported by the rods 8 8, are likewise arranged between the operating-frame and the end of the casing.

A plunger 16 is secured to the inner end of the operating-frame and passes through a perforation 17 provided in the locking-frame. The plunger is suitably pivoted at its opposite end to a lip or projection 18, formed upon a rotatable post 19, that is journaled in the casing. Said post projects above the top plate 20, thereby permitting same to be rotated by a crank or other suitable means. An operating-lever 21 is rigidly secured to the rotatable post, above the top plate, and its free end 22 is adapted to engage with a hook or recess 23, formed by the smaller arm of a locking-lever 24, that is pivoted to the casing. The longest arm of said locking-lever is preferably provided with a hook 25, adapted to engage with a hook 26, formed on a trip-lever 27, that is likewise pivoted to the casing. Said trip-lever is provided with an upwardly-projecting arm 28, adapted to engage with and be rotated by an arm actuated by a suitable time mechanism in the usual manner.

The adjacent ends of the locking-bolts are oppositely beveled or cut away, so that same will overlap, and are provided in said beveled portions with recesses 29, formed to receive the opposite ends of a lever 30, that is pivoted between the bolts. A recess 31 is provided in one of said bolts to receive the stud formed on the bottom of the locking-frame. The bolts are suitably guided and held against lateral displacement by means of projections 32, that engage slots 33 provided in the bolts.

Secured to the safe-door, a suitable distance from the casing and arranged transversely of the locking-bolts, is a bracket 34, formed with a barrel 35, that provides a bearing for a plunger 36. A cam-lever 37, provided with an outwardly-projecting arm 38, is pivoted to the top of the stem 39 of the plunger and provides means for moving same against a coiled spring 40, contained within the barrel. Said plunger is adapted to engage with a recess 41, formed in the bolt, in the bolt's non-operative position, and hold same against the pressure of the locking-springs.

In order to cast the bolts, the post is rotated by a crank or other suitable means, which actuates the plunger, and thereby forces the operating-frame forward and compresses both the locking and retracting springs. The operating-lever is raised simultaneously by the rotation of the post and in turn raises the locking-lever, permitting the recess formed by the smaller arm thereof to come into engagement with the free end of the arm. As the locking-lever is raised the hook on its longer arm comes into engagement with the hook on the end of the trip-lever, whereby the post is held in its rotated position and the springs are held under compression. When the bolt-trip is actuated by closing the door of the safe and causing the door of the safe to engage the cam-lever and depress same, thereby raising the plunger and freeing the locking-bolts, the locking-springs force the locking-frame forward against the inner end of the operating-frame or the end of the casing, thereby carrying forward the projecting stud which casts the bolts. Meanwhile the retracting-springs remain under compression. When the levers are released by the rotation of the trip-lever, which disengages same from the locking-lever and frees the operating-lever, the retracting-spring forces both frames backward into their non-operative position, thereby drawing back the stud on the locking-frame and retracting the bolts.

To prevent the trip-lever from being disengaged accidentally by means of a jar or concussion, a guard 42 is provided, that is pivoted to a lug 43 or to the casing. Said guard is provided with a notch or notches adapted to seat and engage with a projecting pin 44, formed on the trip-lever. Said notches are preferably formed in a slot 45 provided through the guard. A spring 46, secured at one end to the lug or the casing, bears against the bottom of the guard and holds same normally in engagement with the pin. The guard is so arranged in relation to the trip-lever that it is depressed and the pin and notches disengaged by the arm 47, actuated by the time-lock that releases the trip-lever and permits the retraction of the locking-bolts.

To prevent the bolts from being retracted before the levers are released, I provide a detent 48, that is pivoted to the casing, preferably to the bottom of the top plate, and seats in a recess 49, formed in the top of the frames. Said detent is provided with a curved slot 50, adapted to receive a projection 51, that is provided on the bottom of the operating-lever and projects inward through a perforation 52, formed in the top plate. A spring 53 is secured to the detent and passes over said projection, so that when the lever is rotated from its non-operative to its operative position the spring will be brought under tension. The detent is held against upward displacement, however, until the bolt-trip is actuated and the locking-frame is cast by the locking-spring.

The detent is then raised by the spring so that it seats between the abutment formed in the casing and the locking-frame. When the levers are released, the projection, engaging the recess, carries the detent downward on its pivot and permits the retracting-spring to return the frames to their non-operative position.

Various changes within the skill of the mechanic may be made as regards the mechanism herein disclosed without departing from my invention, provided the means covered by any one of the following claims be employed.

I claim as my invention—

1. In an automatic safe-lock, the combination of a locking-frame and an operating-frame inclosed by and movable within the locking-frame, said locking-frame being operatively connected with the locking-bolts, means for positively casting said operating-frame, means arranged between said frames for automatically casting the locking-frame when the operating-frame is in its cast position, and means arranged between the operating-frame and the casing to retract both of said frames, substantially as described.

2. In an automatic safe-lock, the combination of two frames, each consisting of parallel end plates rigidly secured together, one of said frames being movable between the end plates of the other frame, and means for actuating said frames, substantially as described.

3. In an automatic safe-lock, the combination of a locking-frame and an operating-frame, each consisting of parallel end plates rigidly connected together, the operating-frame being movable between the end plates of the locking-frame, said locking-frame being operatively connected with the locking-bolts, means for positively moving the operating-frame and means for automatically moving the locking-frame, substantially as described.

4. In an automatic safe-lock, the combination of a locking-frame operatively secured to the locking-bolts and an operating-frame inclosed by and movable in said locking-frame, each of said frames consisting of parallel end plates connected by a base-plate, a spring arranged between the locking-frame and the operating-frame, a spring between the locking-frame and the casing, and means for positively moving the operating-frame in one direction, substantially as described.

5. In an automatic safe-lock, the combination with a casing provided with an opening in its bottom, of an operating-frame and a locking-frame, each consisting of two parallel end plates connected by a base-plate, said operating-frame being inclosed by and movable in the locking-frame, a projection upon said locking-frame extending through the slot in the casing and engaging with the locking-bolts, means for positively moving the operating-frame in one direction, a spring between said locking-frame and operating-frame for automatically casting said locking-frame

in the same direction, and a spring between the locking-frame and the casing for automatically retracting both of said frames, substantially as described.

5 6. In an automatic safe-lock, the combination of a locking-frame operatively connected with the locking-bolts, an operating-frame within said locking-frame, said frames being movably mounted upon rods arranged within
10 the casing, a rotatable post operatively connected to said operating-frame and adapted to move same in one direction, means for temporarily holding said operating-frame in its adjusted position, a spring arranged between
15 said frames adapted to automatically cast the locking-frame, a spring between said operating-frame and the casing to automatically retract both of said frames, when the operating-frame is released, and means for preventing
20 the casting of said locking-frame while the operating-frame is being actuated, substantially as described.

7. In an automatic safe-lock, the combination with two or more locking-bolts suitably
25 connected to be simultaneously cast in opposite directions, of a locking-frame provided with a projection engaging one of said bolts, an operating-frame movable within the locking-frame, both of said frames being mounted
30 upon rods arranged in the casing, a rotatable post journaled in said casing and adapted to move said operating-frame in one direction, a lever rotatably connected with said post and means for temporarily holding said lever in
35 its adjusted position, a spring arranged between frames to cast said locking-frame, a spring between the operating-frame and the casing to retract both of said frames when said lever is in its non-operative position
40 while the operating-frame is being moved, and means for preventing the retraction of the bolts before said lever is released, substantially as described.

8. In an automatic safe-lock, the combination with a locking-bolt, of a movable frame
45 operatively connected with said bolt, an operating-frame movable within the locking-frame, a rotatable post adapted to move said operating-frame in one direction, an operating-lever in its adjusted position, a spring between
50 said frames to automatically cast the locking-frame, a spring between said operating-frame and the casing to retract both of said frames, a trip arranged to prevent the casting of the bolts while the operating-frame
55 is being moved, a detent adapted to prevent retraction of the bolts before said operating-lever is released, and means for automatically rotating the trip-lever and releasing the operating-lever, substantially as described.
60

9. In an automatic safe-lock, the combination with a rotatable post operatively connected with the bolt-actuating mechanism, of
65 an operating-lever rotatively secured thereto, a locking-lever adapted to be raised by the rotation of said operating-lever and provided near one end with a bent arm forming a re-

cess to engage the free end of the operating-lever in its raised position, and at its other
70 end with a hook, a trip-lever provided with a hooked end engaging the hook on the locking-lever in its raised position, and means for rotating said trip-lever to disengage same and the locking-lever and thereby release the operating-lever, substantially as described. 75

10. In an automatic safe-lock, the combination with means for holding the bolt-actuating mechanism in its locked position, of a
80 device for yieldingly engaging said holding means whereby the same is held locked until released by the time mechanism, substantially as described.

11. In an automatic safe-lock, the combination with interlocking levers for holding
85 the bolt-actuating mechanism in its locked position, of a device for yieldingly engaging said levers whereby same are held locked until released by the time mechanism, substantially as described.

12. In an automatic safe-lock, the combination with means for holding the bolt-actuating
90 mechanism in its locked position, of a guard pivoted to a stationary portion of the lock for yieldingly engaging with said holding means whereby the bolt-actuating mechanism is held locked until released by the time
95 mechanism, substantially as described.

13. In an automatic safe-lock, the combination with means for holding the bolt-actuating
100 mechanism in its locked position, of a guard for yieldingly engaging said holding means whereby same is held locked until released by the time mechanism, and means for disengaging said guard and for releasing the bolt-actuating mechanism, substantially as
105 described.

14. In an automatic safe-lock, the combination with interlocking levers for holding
110 the bolt-actuating mechanism in its locked position, of a guard for holding said levers locked until released by the time mechanism, and means for yieldingly holding said guard in engagement with one of said levers, substantially as described.

15. In an automatic safe-lock, the combination with interlocking levers for holding
115 the bolt-actuating mechanism in its locked position, one of said levers being provided with a projection, of a guard pivoted to the casing and provided with a slot having a notch
120 therein, a spring yieldingly holding said notch in engagement with said projection whereby said levers are held locked until released by the time mechanism, and means for disengaging said guard and for unlocking the le-
125 vers, substantially as described.

16. In an automatic safe-lock, the combination with interlocking levers for holding
130 the bolt-operating mechanism in its adjusted position, of a guard provided with notches adapted to engage with one of said levers, and means for holding one of said notches in engagement with the lever in its interlocked position, said guard being adapted to be disen-

gaged without releasing said levers, substantially as described.

17. In an automatic safe-lock, the combination with a lever for holding the bolt-operating mechanism in its adjusted position and a projection on said lever, of a guard pivoted to the casing and provided with notches, a spring for yieldingly holding said notches in engagement with said projection, and means for disengaging same before the bolt-operating mechanism is released, substantially as described.

18. In an automatic safe-lock provided with a movable frame operatively connected with locking-bolts, a detent pivoted to the casing and adapted to engage between said frame and the casing in the bolt's cast position, substantially as described.

19. In an automatic safe-lock, the combination with a movable frame operatively secured to the locking-bolts, and interlocking means for holding the frame in its adjusted position, of means engaging between said frame and a fixed portion of the lock in the bolt's cast position to hold same against retraction until said interlocking means are released, substantially as described.

20. In an automatic safe-lock, the combination with means for actuating the locking-bolts, of a detent pivoted to a stationary portion of the lock and adapted to engage between said bolt-actuating means and a fixed portion of the lock in the bolt's cast position, substantially as described.

21. In an automatic safe-lock, the combination with a movable frame for casting and retracting the locking-bolts and interlocking means for holding said frame in its adjusted position, of a detent operatively connected with said interlocking means and adapted to engage between the frame and a rigid portion of the lock in the bolt's cast position and to be disengaged when said means are unlocked to permit retraction of the bolts, substantially as described.

22. In an automatic safe-lock, the combination with a movable frame for casting and retracting the locking-bolts and interlocking levers for holding said frame in its adjusted position, of a detent operatively connected with one of said levers and adapted to engage between said frame and the casing in the le-

ver's interlocking position and to be disengaged therefrom in the lever's unlocked position, substantially as described.

23. In an automatic safe-lock, the combination with a movable frame, and a lever operatively connected with said frame, of a detent pivoted to the casing, means for moving the detent between the frame and casing in the lever's operative position, and means connected with said lever for disengaging said detent in the lever's non-operative position, substantially as described.

24. In an automatic safe-lock, the combination with a movable frame, and a lever operatively connected with said frame, of a detent pivoted to the casing and provided with a curved slot, a spring secured to said detent adapted to move same between the frame and the casing in the lever's operative position, and a projection on the lever engaging said slot and adapted to remove said detent in the lever's non-operative position, substantially as described.

25. In an automatic safe-lock, the combination with the locking-bolts, of a lever pivoted between said bolts, the ends of said lever engaging corresponding recesses provided in said bolts to cast said bolts in opposite directions, and means for actuating one of said bolts, substantially as described.

26. In an automatic safe-lock, the combination with two locking-bolts having oppositely-beveled ends each provided with a recess, a lever pivoted between said bolts engaging said recesses, and a movable locking-frame operatively connected with one of said bolts, and means for actuating said locking-frame, substantially as described.

27. In an automatic safe-lock, the combination with a locking-bolt provided with a recess, of a bracket arranged above said recess, a plunger movable in said bracket, and a cam-lever pivoted to the stem of the plunger and fulcrumed upon the bracket to actuate the plunger, substantially as described.

In testimony whereof I sign this application, in the presence of two witnesses, this 17th day of June, 1899.

JOHN D. SPRING.

Witnesses:

J. R. KRAUS,
G. H. FOSTER.