

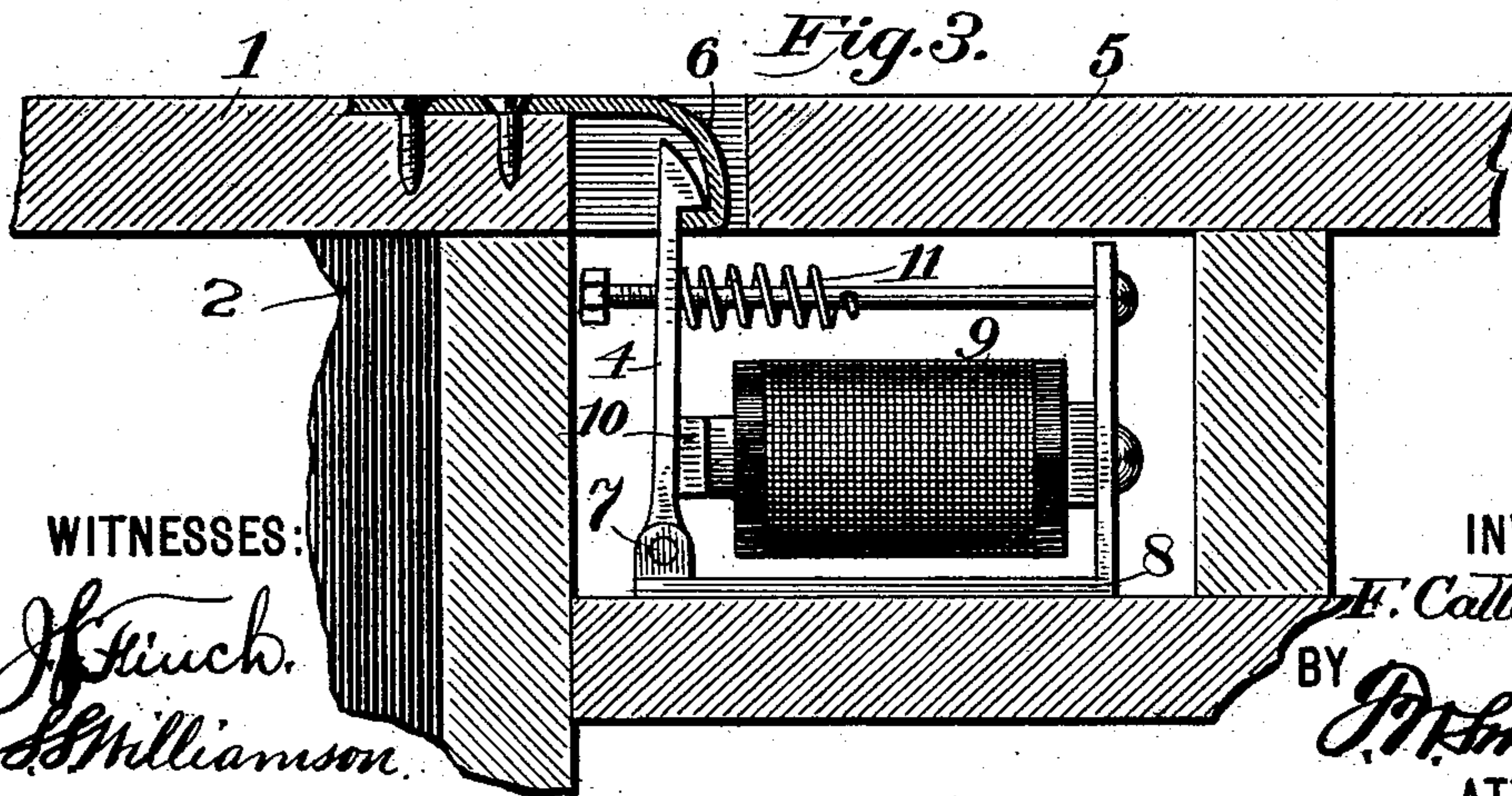
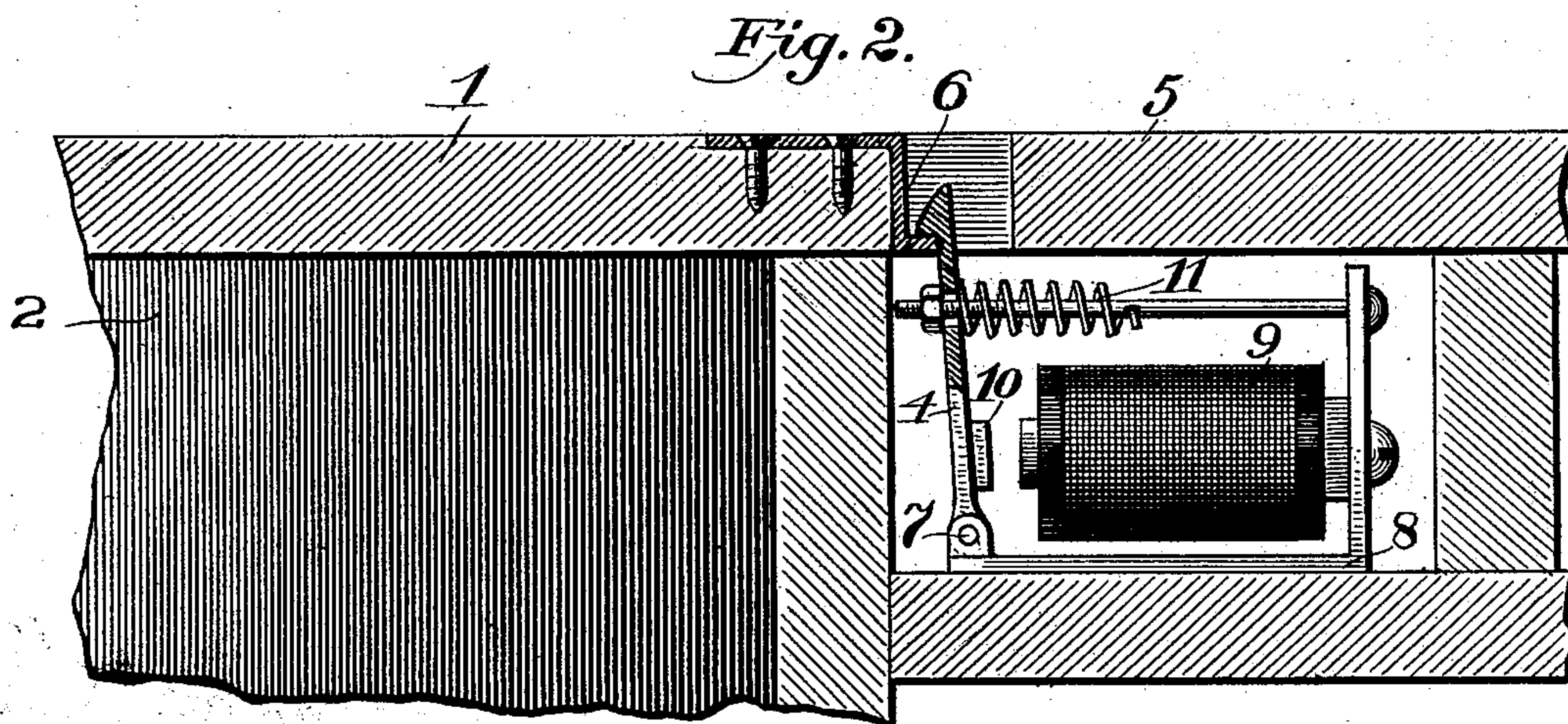
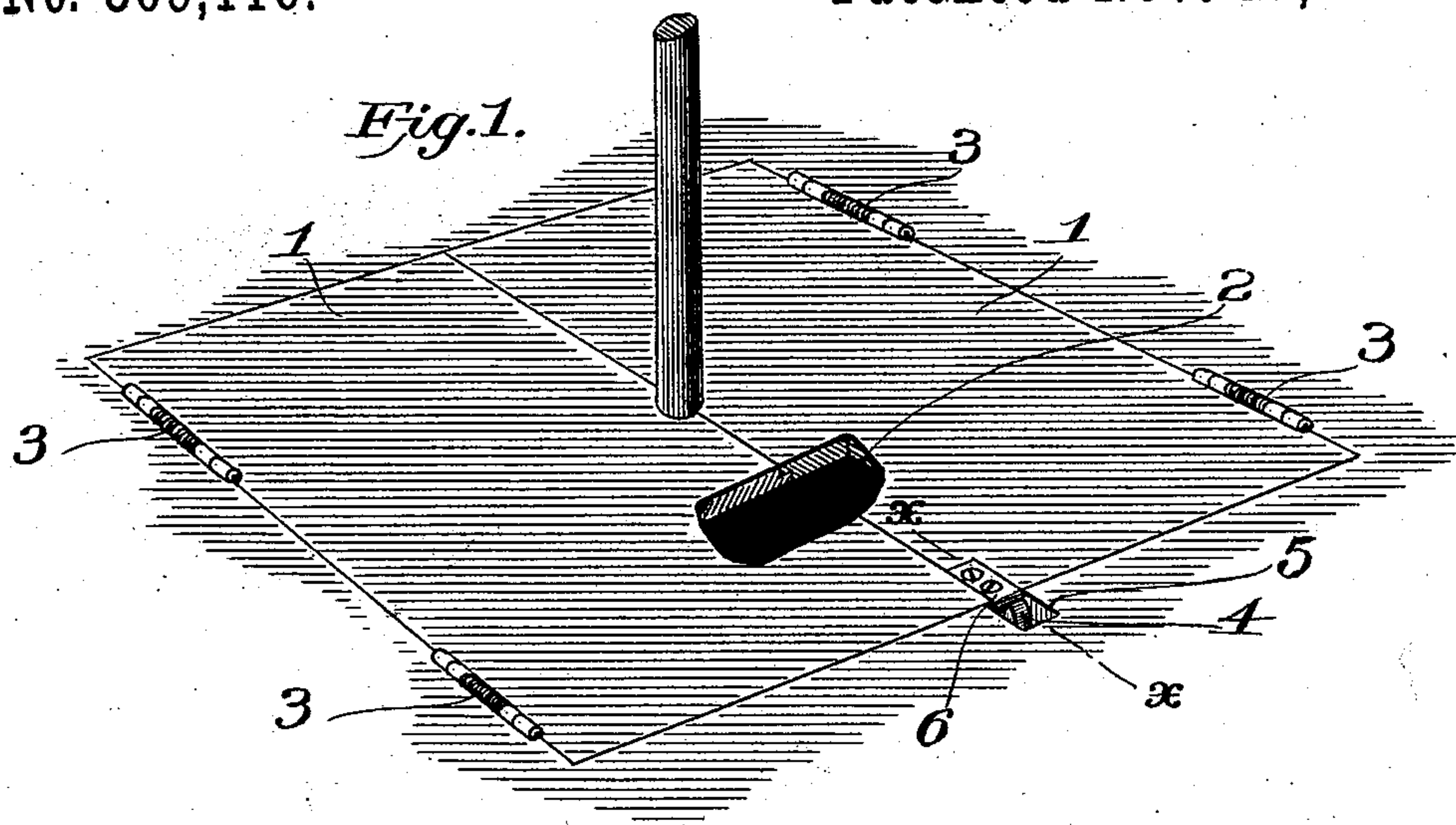
(No Model.)

2 Sheets—Sheet 1.

F. CALLAHAN.  
ELECTRICALLY CONTROLLED DOOR.

No. 509,116.

Patented Nov. 21, 1893.



WITNESSES:

*J. H. Krich.*  
*S. Williamson.*

INVENTOR

*F. Callahan.*

BY

*J. D. Smith.*  
ATTORNEY



(No Model.)

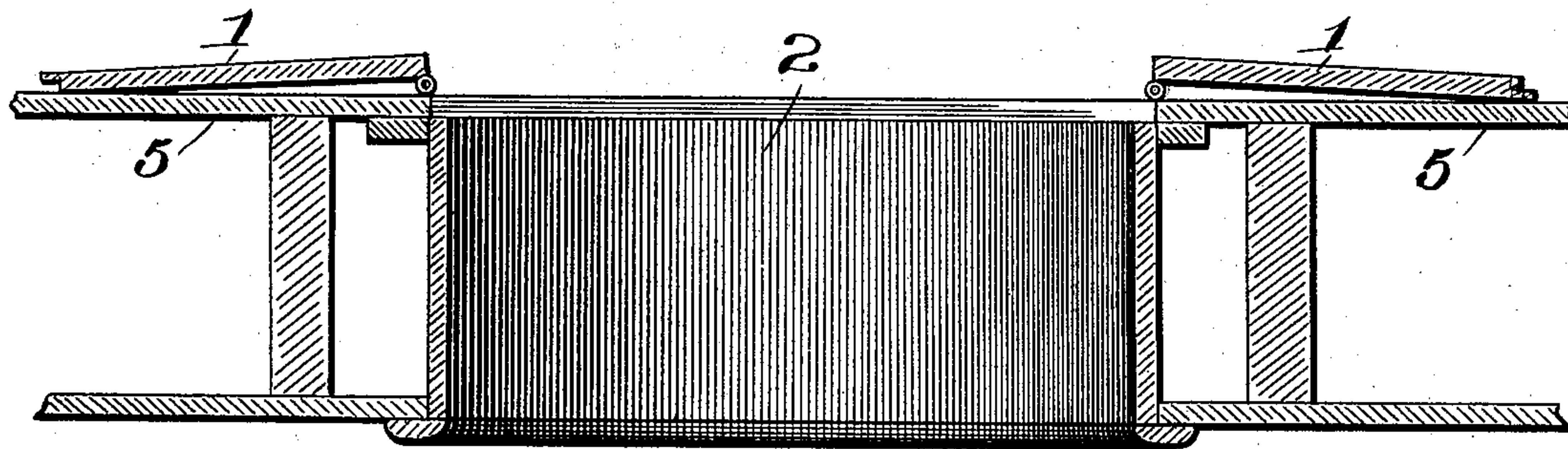
2 Sheets—Sheet 2.

F. CALLAHAN.  
ELECTRICALLY CONTROLLED DOOR.

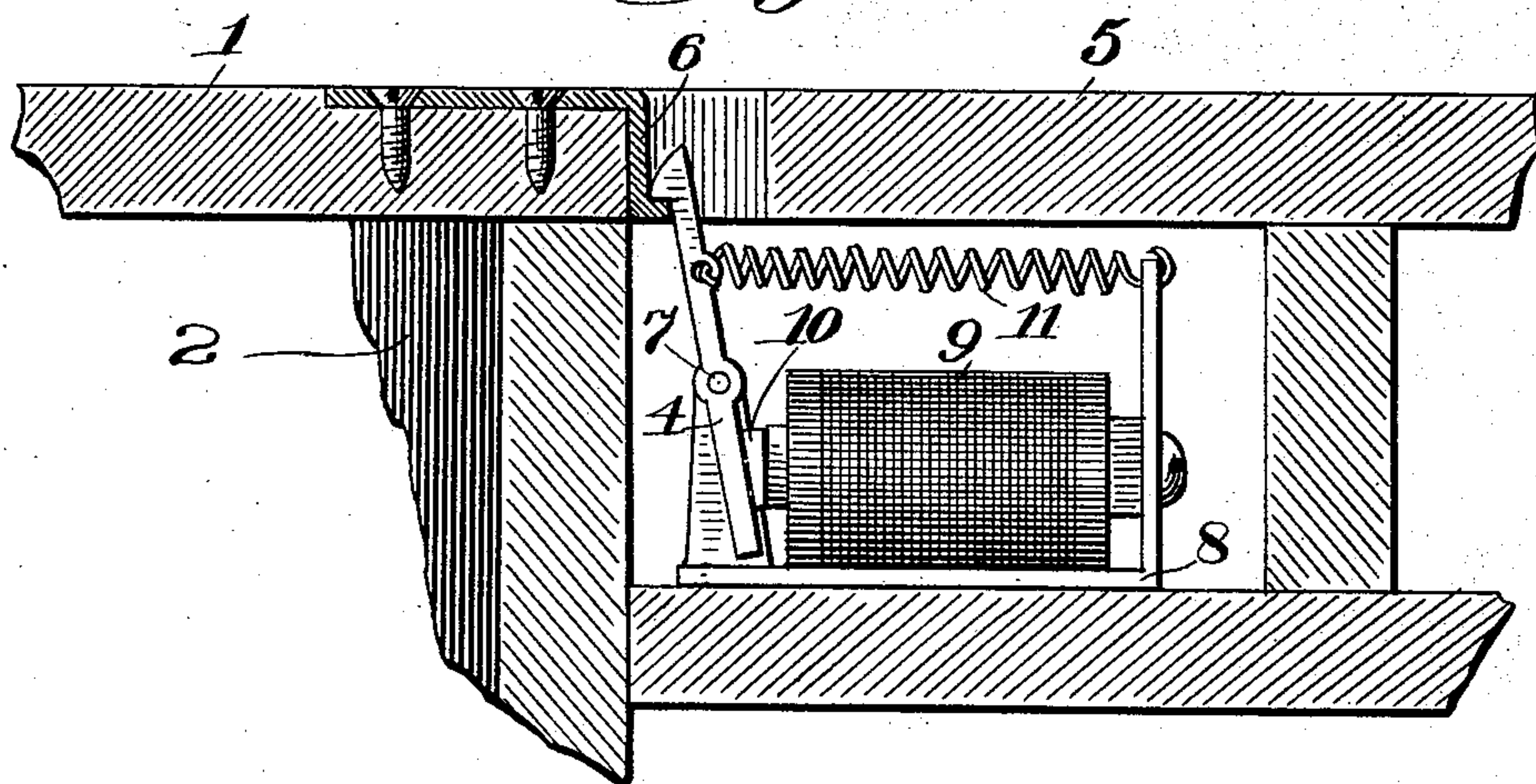
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*Fig. 4.*



*Fig. 5.*



WITNESSES:

*J. Finch.*  
*S. Williamson.*

INVENTOR

*F. Callahan.*

BY

*A. Smith Jr.*

ATTORNEY



# UNITED STATES PATENT OFFICE.

FRANK CALLAHAN, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO JACOB B. KLEIN, OF SAME PLACE.

## ELECTRICALLY-CONTROLLED DOOR.

**SPECIFICATION** forming part of Letters Patent No. 509,116, dated November 21, 1893.

Application filed April 8, 1892. Serial No. 428,369. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK CALLAHAN, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Electrically-Controlled Doors; 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.

My invention relates to certain new and useful improvements in electrically controlled trap doors, and is especially designed to be used in connection with the "man hole" in a fire engine house.

In my pending application, Serial No. 415,029, filed December 14, 1891, I have shown and described trap doors held in closed position by the action of electro-magnets upon armatures carried by the doors, the latter adapted to open with a spring action when the magnets have lost their vitality.

The present improvement contemplates the use of a hook catch or similar device for holding the doors closed, and an electro-magnet for controlling the operation of said hook.

In the accompanying drawings,—Figure 1 is a perspective showing the trap doors closed; Fig. 2, a broken sectional elevation at the line  $x, x$ , of Fig. 1; Fig. 3, a view similar to Fig. 2, but showing the position of the hook and catch-plate reversed, the magnet in Fig. 3 being in a closed circuit to maintain the doors in closed position, while in Fig. 2 the magnet is in an open circuit to effect the same result. Fig. 4 is a broken sectional elevation showing the "man hole" and the doors open, and Fig. 5, a sectional elevation showing a modified form of the constructions shown in Figs. 2 and 3.

Similar numbers denote like parts in the several figures of the drawings.

1 are the doors hinged at the sides of the "man hole," 2 and provided with ordinary spring elements 3 at the hinges whereby said doors are thrown open.

4 is a pivoted catch-hook located below the floor 5, and 6 a catch plate secured to one of

the doors with which plate said hook engages to hold the doors closed. The meeting edges of the doors are preferably rabbeted as seen at Fig. 1, so that a single catch-plate in connection with the hook will be sufficient to hold both doors in closed position, although, if desired, there may be two sets of catch plates and hooks. I shall, however, hereinafter refer to but one set of devices for holding both doors, but I do not wish to be limited in this respect since the duplication of such devices is immaterial. The hook 4 is pivoted at 7 to a frame 8 secured beneath the floor.

9 is an electro-magnet supported by the frame 8, and 10 an armature carried by the hook and within the field of said magnet.

11 is a spring whose function is to so act on the hook as to cause the latter to resist the attraction of the armature carried by the hook. The spring may effect the automatic engagement of the hook and catch-plate, as shown at Fig. 2, in which instance the magnet is never in electrical circuit except when the alarm is sounded, and when this happens the magnet will attract the armature, thereby retracting the hook against the action of the spring and releasing the doors.

In Figs. 3 and 5, the magnet is always in circuit except when the alarm is sounded, and the engagement of the hook and catch-plate is effected by the attraction of the armature by said magnet, the releasing of the doors being accomplished by the action of the spring when the circuit is broken by the sounding of the alarm.

I do not therefore wish to be confined to any especial arrangement of spring or magnet, or to the maintaining of the closed position of the doors by the effective action of either of such elements alone, the gist of my invention in this respect resting in the broad idea of controlling the hook by the forces of a spring and magnet applied and acting in opposite directions.

I claim—

1. The combination with the hinged doors and springs adapted normally to open said doors, of a catch-plate carried by one of the doors, a pivoted hook designed to engage the

catch, an armature carried by the hook, and an electro-magnet supported contiguous to the armature.

2. The combination with the hinged doors  
5 and springs adapted normally to open said doors, of a catch-plate carried by one of the doors, a frame located adjacent to the meeting-edges of the doors, an electro-magnet supported by the frame, a pivoted hook carried

by the frame and adapted to engage the catch-plate, an armature carried by the hook, and a spring co-acting with the hook.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK CALLAHAN.

Witnesses:

F. W. SMITH, Jr.,

JONATHAN GODFREY.