

No. 621,403.

Patented Mar. 21, 1899.

W. A. FROECKMAN.
DOOR FOR FIRE ALARM BOXES.

(No Model.)

(Application filed Aug. 22, 1898.)

3 Sheets—Sheet 1.

Fig. 1.

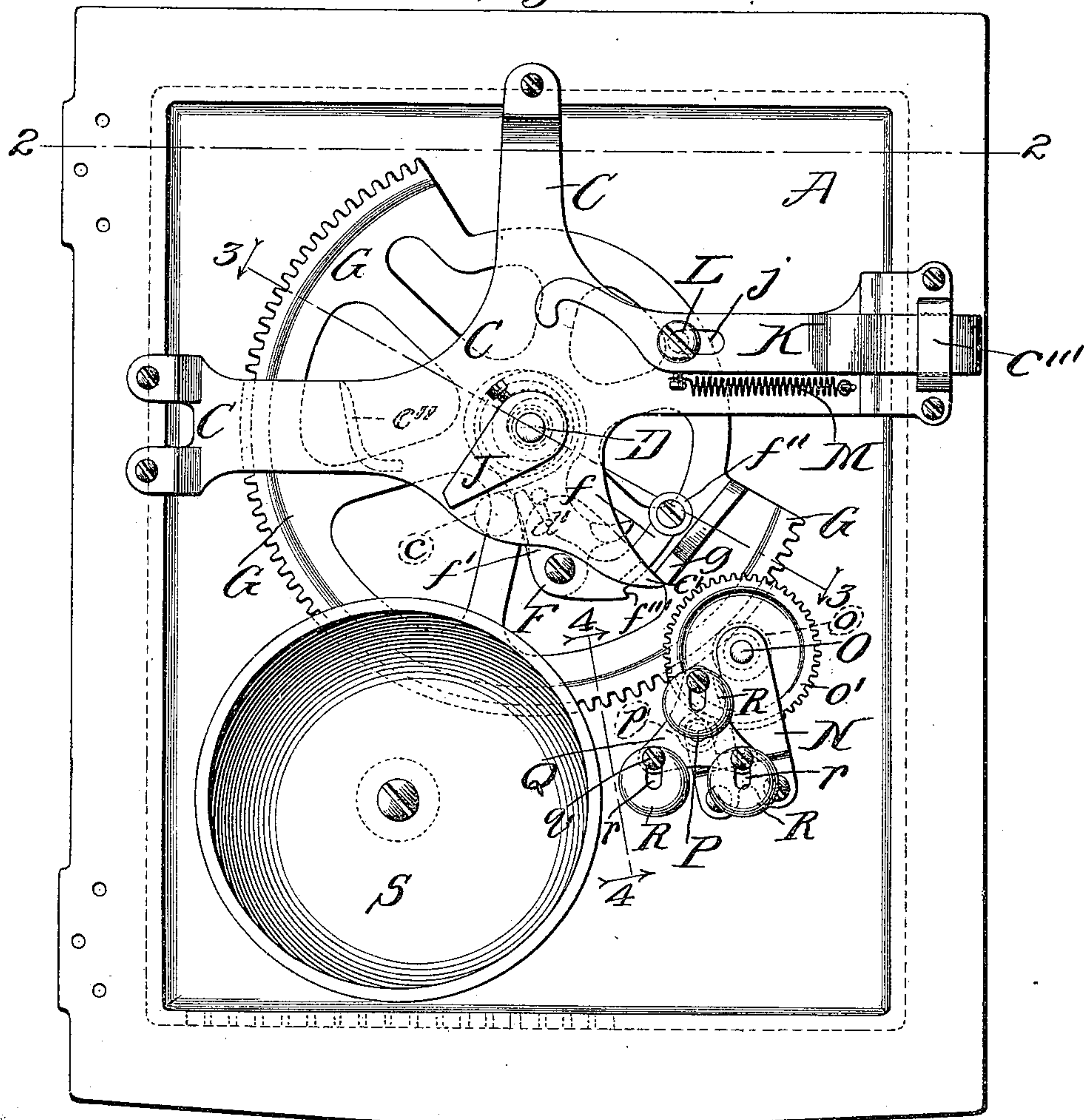
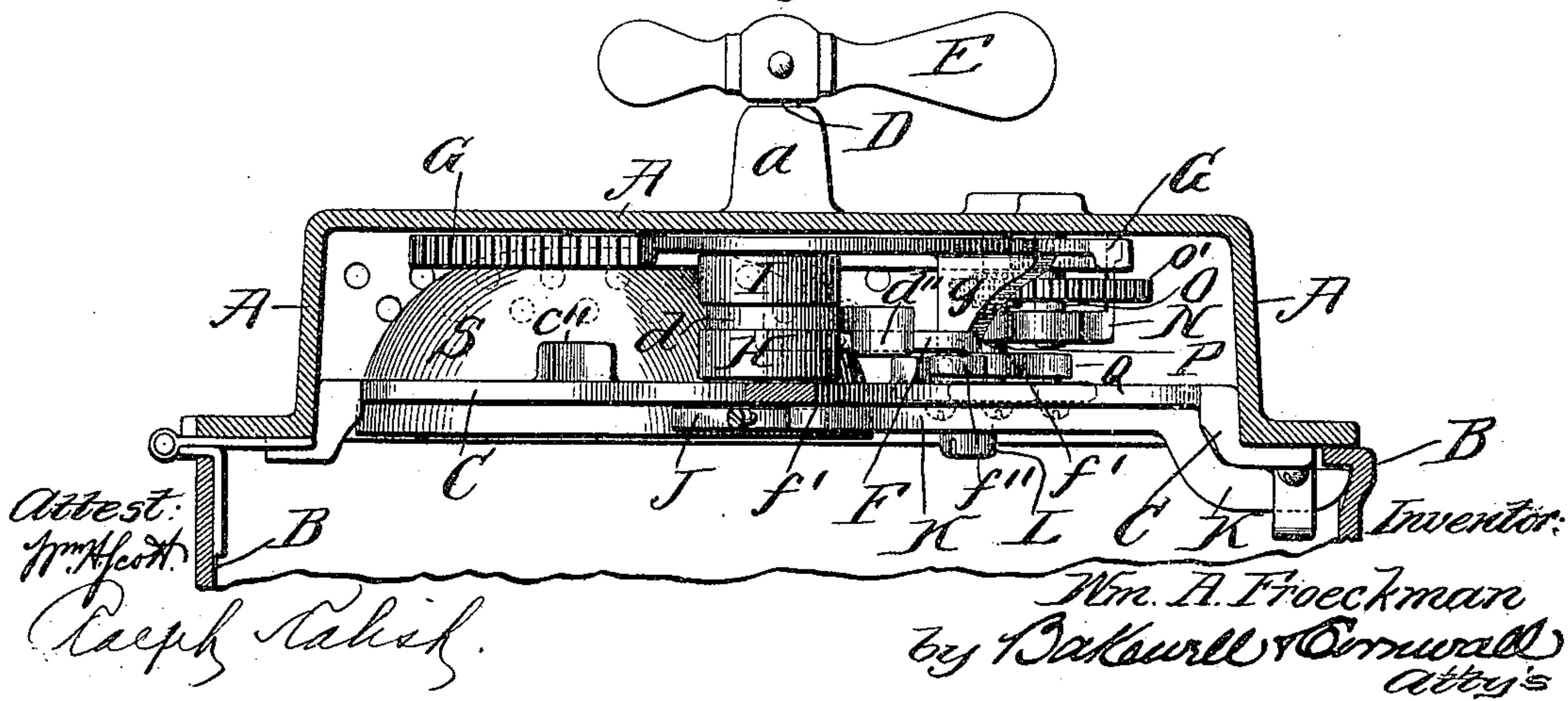


Fig. 2.



No. 621,403.

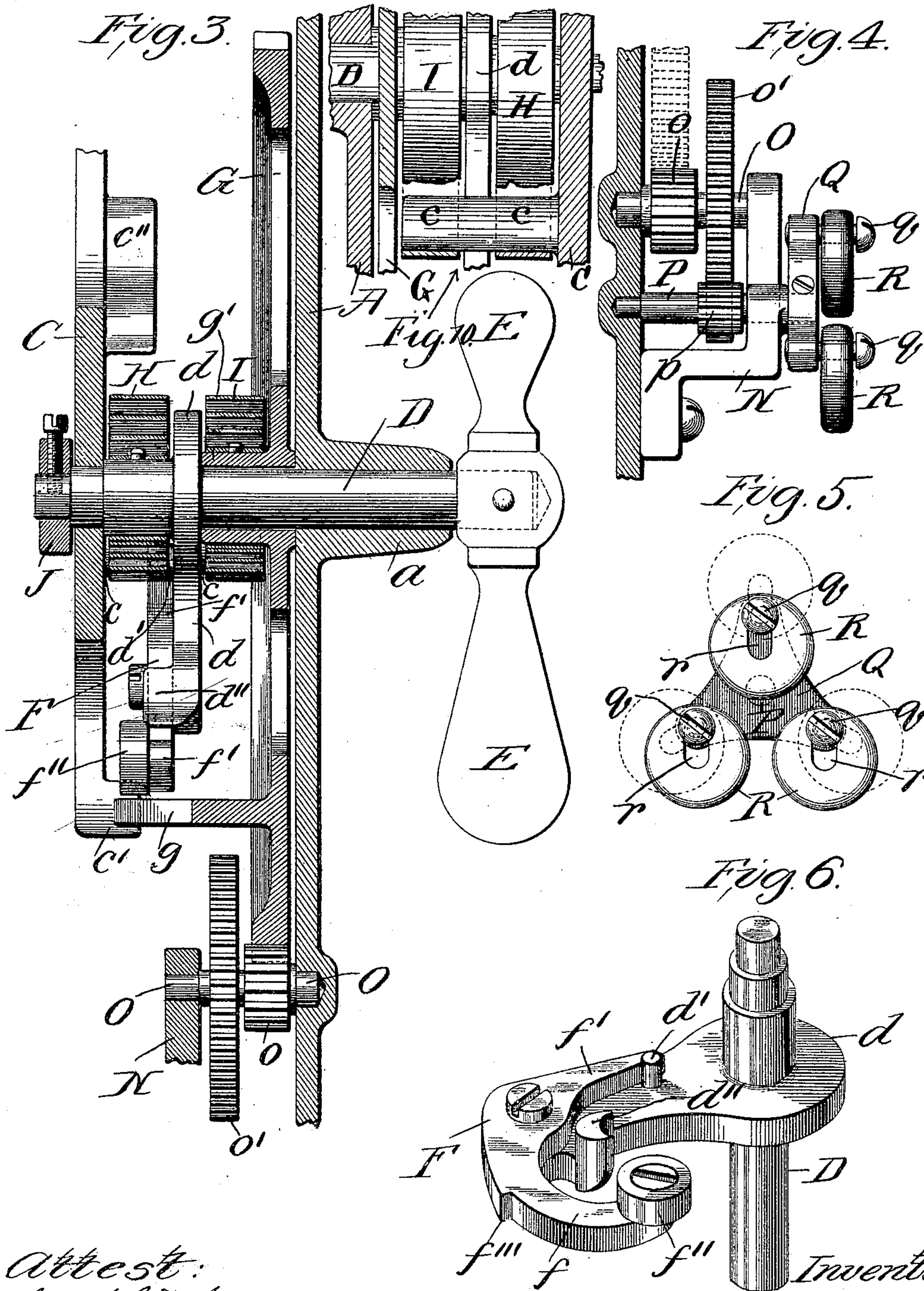
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3 Sheets—Sheet 2.



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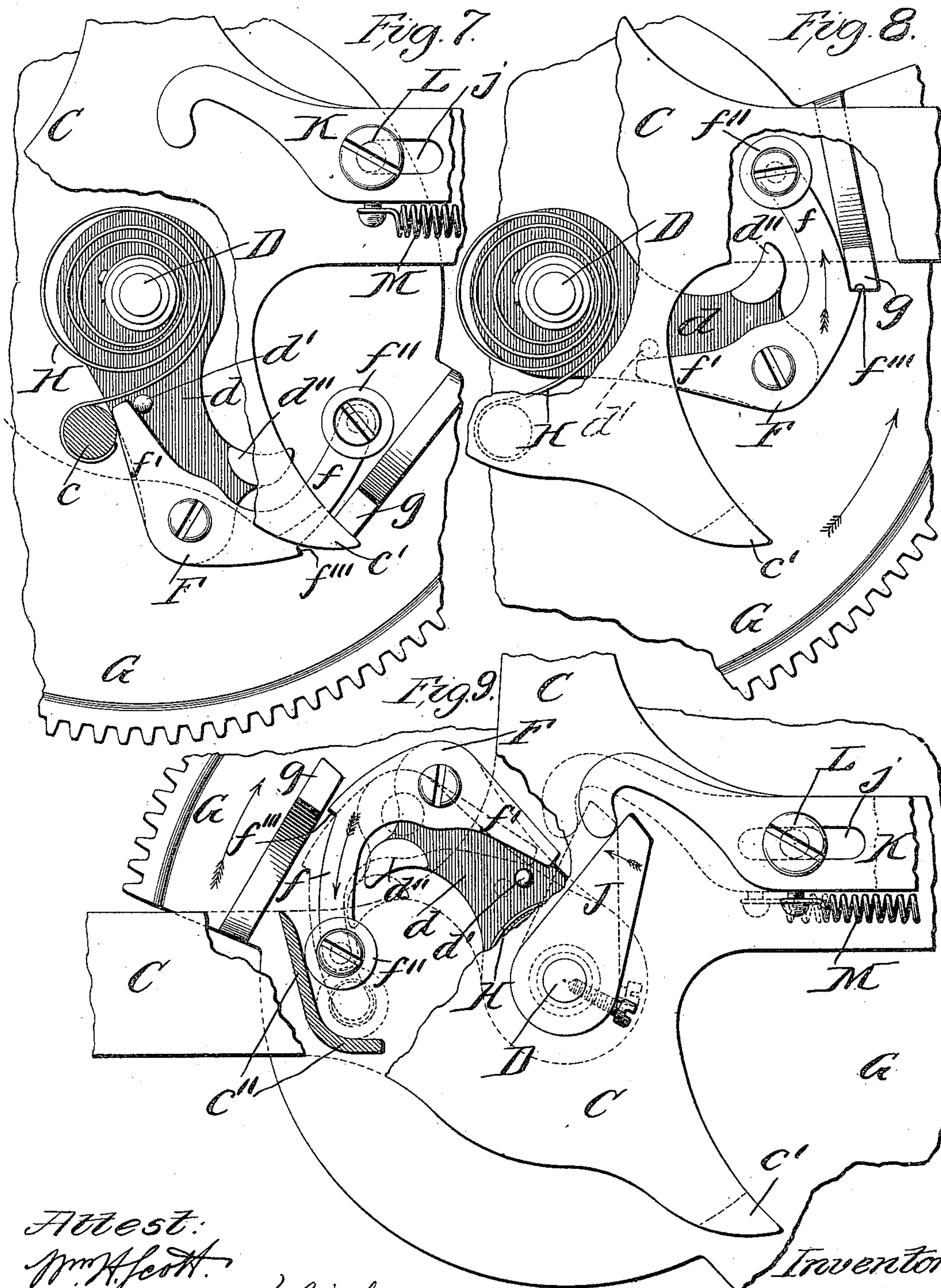
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

WILLIAM A. FROECKMAN, OF ST. LOUIS, MISSOURI.

DOOR FOR FIRE-ALARM BOXES.

SPECIFICATION forming part of Letters Patent No. 621,403, dated March 21, 1899.

Application filed August 22, 1898. Serial No. 689,185. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. FROECKMAN, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have
5 invented a certain new and useful Improvement in Keyless Doors for Fire-Alarm Boxes, &c., of which the following is a full, clear, and exact description, such as will enable
10 others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an inside elevational view of my improved keyless door for fire-alarm boxes,
15 &c. Fig. 2 is a horizontal sectional view on line 2 2, Fig. 1. Fig. 3 is an enlarged oblique sectional view on line 3 3, Fig. 1. Fig. 4 is an enlarged detail vertical sectional view on line 4 4, Fig. 1. Fig. 5 is an enlarged detail
20 view of the bell-ringing hammers mounted upon their support. Fig. 6 is an enlarged perspective view of the main shaft and its carried arm, together with its bell-crank lever. Figs. 7, 8, and 9 are enlarged detail views of
25 the mechanism employed in opening the door and causing an alarm to be sounded, said views illustrating the several different positions assumed by said mechanism in one complete operation—that is, Fig. 7 illustrates the
30 home or locked position, Fig. 8 the position of the several parts when the mechanism is moving in the proper direction preparatory to the opening of the door, and Fig. 9, in full lines, the position of the parts after the spur-
35 gear has been released, the same starting immediately back in the opposite direction to that in which it came, whereby an alarm is sounded which cannot be controlled by the operator. The dotted lines of the several
40 parts in this figure illustrate the continued and limited movement of the mechanism, the same drawing the bolt of the door, permitting the same to be opened. Fig. 10 is an enlarged vertical sectional view on line 10 10 of
45 Fig. 7.

This invention relates to a new and useful improvement in keyless doors for fire-alarm boxes, &c., whereby access to said box is obtained by turning a suitable handle outside
50 of said door and at the same time causing a local alarm to be sounded before said door can be opened for the purpose of attracting

the attention of the public to the fact that an alarm is to be turned in.

The object of my present invention is to
55 provide a simple, durable, reliable, and inexpensive door for fire-alarm boxes, &c., and one which when once in place is not likely to become out of order, another object being to obviate several of the objectional features
60 found in doors of similar character. I am aware that various devices exist for accomplishing this end, wherein is shown an escapement-movement coöperating with a
65 “toothed disk” or spur-gear. In this construction it will be readily understood that in course of time the teeth of the disk or gear will become worn or rounded from their constant
70 coaction with the escapement, as will also the engaging ends of said escapement, thus preventing the hammer of the bell secured to said escapement from delivering its
75 designed blow, and when these parts are badly worn hardly any sound will be heard outside of the box. Another objection found
80 in this construction is that frequently the hammer of the bell becomes broken or the end becomes so battered that it will not strike, and as this single bell-hammer is the sole medium of sounding the alarm the alarm is thus
85 rendered useless for the purposes it is designed to serve. These objections are clearly obviated by the use of the construction employed in my invention, as will hereinafter be fully pointed out.

With these objects in view this invention consists in the construction, arrangement, and combination of the several parts, all as will hereinafter be described and afterward
90 pointed out in the claims.

In the drawings, A indicates the door, containing thereon my present invention.

B indicates the box to which door A is hinged, as shown in Fig. 2, said door being preferably channel-shaped in cross-section,
95 whereby the mechanism employed in carrying out my invention is permitted to be wholly contained therein, thus occupying no space in the box B.

C indicates a suitable bridge or support,
100 preferably secured to the inner edges of the door, said bridge performing several functions, the most important of which is to support the inner end of the main shaft D. This

main shaft D is supported upon its inner end by the bridge C, as before stated, and its other end or outer end is supported by and journaled in the door proper, said door being reinforced at this journal by an extended boss *a*, through which said main shaft passes. This boss in addition to forming an extended bearing for said shaft also acts as a distance-piece, in that it necessitates placing the handle E, secured to the outer end of shaft D, sufficiently far from the cover to enable the operator to insert the fingers of the hand between said handle and door when in the act of gripping said handle preparatory to or in the act of opening the same.

Formed on or secured to the shaft D is an arm *d*, preferably located between the inside face of the door A and the bridge C. Upon the outer end of this arm is pivoted a bell-crank lever or engaging dog F, the arms of which will be referred to as *f* and *f'*. The outer or free end of the arm *f* carries an anti-friction-roller *f''*, and upon the outer edge of this arm *f* is formed a notch or shoulder *f'''*, preferably located between the pivot-point of said arm and said roller. The arm *f'* of this bell-crank lever is designed to cooperate with suitable stops *d'* and *c*, the latter of which is a projection formed on the bridge C, while the stop *d'* is formed on the arm *d*. The functions of these stops are to properly position and hold the bell-crank lever so that the shoulder *f'''* will be in the direct path of a lug or projection *g* formed integral with a spur-gear or segment G, said spur-gear or segment being loosely mounted upon the shaft D and preferably located between the arm *d* and the door A. One position of this bell-crank causes the shoulder *f'''* to engage the projection *g*, which is accomplished by the return of the arm *d* and its carried bell-crank F to its home position, as shown in Fig. 7, which will cause the arm *f'* of said bell-crank to cooperate with the projection *c* and force said bell-crank to its proper position, whereupon further movement of the same will cease, as the arm *d* is simultaneously arrested in its home position by its contact with said projection *c*. The stop *d'* is for the purpose of preventing any further inward movement of the arm *f'* of the bell-crank after said arm *f'* has been moved by the movement of the arm *d*, when the mechanism is started in the proper direction for opening the door.

II indicates a spiral spring, one end of which is attached to the main shaft D and the other end secured to the projection *c* of the bridge or support, said spring being so arranged that when the mechanism is in a home position little or no tension or power is in said spring; but when the main shaft is turned, as in the operation of opening the door, sufficient power will be stored up in said spring to readily recover said shaft and its carried parts to their home position.

The spur-gear or segment G, which, as before mentioned, is loosely mounted upon the

shaft D, is preferably formed with a hub *g'*, which encircles said shaft and is sufficiently long to occupy the entire space between the arm *d* and the inner face of the door A. Upon this hub, between said arm *d* and the spokes of the spur-gear, is secured one end of a spiral spring I, while the other end of said spring is secured to the projection *c*. The construction of this spring, as well as the manner in which it is secured to the projection *c*, is substantially similar to that of spring II, and its function is also somewhat the same, in that when the spur-gear or segment is in a home position little or no tension or power is stored in said spring; but when said spur-gear or segment is rotated in the proper direction for opening the door sufficient power will be stored in said spring to readily recover said spur-gear to its home position, when the same is released by the disengagement of the shoulder *f'''* of the bell-crank F, as will hereinafter be explained. In other words, spring I returns the spur-gear to its home position, while the spring II acts in like manner to return the main shaft and its carried parts.

When the mechanism employed in this invention is in a home position, further movement in that direction is prevented by stops *c*, before referred to, and *c'*, the former arresting the arm *d* and its carried parts, which includes also the shaft D and handle E, and the latter arresting the spur-gear or segment G through the medium of the projection *g*, which rests against said stop *c'*, as shown in Figs. 1, 3, and 7.

Upon the inner face of the support or bridge C is located a stationary cam-face *c''*, said cam-face being so arranged that when the arm *d* and its carried bell-crank lever F are brought to a position shown in full lines in Fig. 9 or a position just ready to enable the operator to open the door said cam-face will force the arm *f* of said bell-crank lever, through the medium of the roller *f''*, inwardly, thereby releasing the shoulder *f'''* from its engagement with projection *g* of the spur-gear, permitting said spur-gear to immediately start to revolve, by virtue of the power stored in spring I, in the opposite direction, or to the home position.

J indicates an arm or lever secured to the inner end of the main shaft and preferably located outside the support C. This arm is designed to cooperate at a predetermined time with a locking-bolt K, mounted upon said support C. The exact construction of this bolt or latch I deem non-essential; but for the sake of clearness I will mention that I prefer to form this bolt so that its shape will accommodate itself to said support C and that its outer end will pass through a suitable guide *c'''*, formed upon said support. The inner end of this bolt K is preferably formed with a hook, which offers an engaging point for the outer end of the arm J. The outer end of this bolt K is supported by the guide *c'''*, and to offer a support for its inner end, as

well as to provide a limitation for the stroke of said bolt, I prefer to form a slot *j* in or near the outer end of said bolt, and through which slot passes a suitable screw or pin *L*. In order to make this locking-bolt spring-actuating, I attach at any convenient place a spring *M*, whose tension is exerted in the proper direction to keep the bolt out or in a locked position, as is obvious.

N indicates a suitable bracket, preferably secured to the door *A* and designed to support suitable shafts *O* and *P*, the former of which is provided with a suitable pinion *o*, so placed thereon as to mesh with the spur-gear or segment *G*, said shaft *O* also having secured thereto a spur-gear *o'*, while the latter or shaft *P* is provided with a pinion *p*, so placed thereon as to mesh with the spur-gear *o'*. Secured to the outer end of this shaft *P* is a support *Q*, having mounted thereon a number of bell-hammers *R*. In the drawings I have shown three of these hammers mounted upon their support; but it is obvious that this exact number is immaterial, the essential feature of these bell-hammers being the manner in which they are secured to the support *Q*, the same being accomplished by providing slots *r*, starting from about the center of these hammers, which are preferably disks, and terminating some little distance in a radial direction from the outer edge thereof. Through these slots pass suitable pins or screws *q*, provided upon their outer ends with suitable heads to retain said disks in position thereon.

S represents a suitable bell arranged in proper position relative to the bell-hammers, so that when the support *Q* and its carried hammers are caused to revolve centrifugal force will cause said hammers to move outwardly sufficiently far to strike the bell *S* a sharp elastic blow, which permits the hammer to bounce back after the blow is struck, as will be readily understood by referring to Fig. 5 of the drawings.

The operation of the device is as follows: When it is desired to open the door preparatory to turning in a fire-alarm or other signal, the handle *E* is turned to the right, which causes the shaft *D* and its arm *d* to rotate and cause the shoulder *f'''* of the arm *f* of the bell-crank carried by said arm *d* to engage the projection *g* on the spur-gear or segment, locking said spur-wheel to shaft *D*, so that it will rotate in the same direction. This rotation of the spur-gear *G* causes the rotation of the bell-ringing mechanism in mesh therewith and the bell will sound a local alarm, thus attracting the attention of the public to the fact that a fire or other alarm is about to be turned in. The rotation of the spur-gear *G* is continued until the roller *f''* coöperates with the cam-face *c''*, whereupon arm *f* is forced inwardly, disengaging the shoulder *f'''* from the projection *g* of the spur-gear, allowing the same to immediately start to revolve in the opposite direction by the

tension of the spring *I* regardless of and uncontrollable by the operator. We now have the parts in the position shown in Fig. 9, wherein it will be seen that the lock-bolt is still in its locked position, and a continued movement of the handle *E* is necessary in order to bring the parts into the position shown by the dotted lines in said figure, said dotted lines being the limit of movement of all the parts carried by the main shaft *D*, which movement is stopped by the roller *f''* abutting against the inturned portion of the cam-face *c''*. It will be readily seen from the drawings that in the movement from the position shown in full lines to the position shown in dotted lines the arm *J*, carried by the shaft *D*, will coöperate with the bent end of the bolt *K* and withdraw or unlock the same.

When the bell-crank lever *F* is forced to the position shown in dotted lines in Fig. 9, it is prevented from being accidentally moved further in this direction by the stop *d''* on the arm *d*, and it will be observed that the arm *f'* is some distance away from the stop *d'*. This position of the bell-crank will be retained until the parts have been returned to a home position, whereupon the arm *f'* will strike the projection *c* and be rocked to its initial position, or the position shown in Fig. 7.

It is obvious that should two of the hammers *R* (shown in the drawings) be removed the remaining hammer will still ring the bell.

I am aware that many minor changes in the construction, arrangement, and combination of the several parts of my device can be made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

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

1. The combination with a door, of a main shaft, a spring for returning said shaft to its normal position, an arm carried by said main shaft, a bell-crank lever pivoted on said arm, stops on said arm for limiting the movement of said bell-crank lever, a spur-gear loosely mounted on the shaft, a spring for returning the spur-gear to its normal position, a projection on said spur-gear which coöperates with a fixed stop, and with a shoulder on said bell-crank lever, a fixed cam for disengaging the bell-crank lever from the spur-gear, a latch, an arm on the shaft for operating said latch, a bell-ringing mechanism comprising suitable centrifugal devices, and suitable gearing between said spur-gear and said centrifugal devices, substantially as described.

2. The combination with a door, of a main shaft, a spring for returning said shaft to its normal position, an arm carried by said main shaft, a bell-crank lever pivoted on said arm, stops on said arm for limiting the movement of said bell-crank lever, a spur-gear loosely mounted on the shaft, a spring for returning the spur-gear to its normal position, a pro-

jection on said spur-gear which coöperates
with a fixed stop, and with a shoulder on said
bell-crank lever, a fixed cam for disengaging
the bell-crank lever from the spur-gear, a
5 latch, an arm on the shaft for operating said
latch, a pinion *o* meshing with said spur-gear,
a shaft *O*, upon which said pinion is secured,
a bracket *N*, secured to the door, and which,
together with said door, forms a suitable sup-
10 port and bearing for said shaft, a spur-gear
o', mounted on said shaft *O*, a pinion *p*, mesh-
ing with said spur-gear *o'*, a shaft *P* upon
which said pinion *p* is secured, said shaft *P*
being also supported by, and journaled in
15 said bracket *N*, and the door, a support *Q* se-
cured to said shaft *P*, pins or screws *q* secured
to said support *Q*, hammers *R* loosely mounted

upon said pins or screws, slots or openings *r*,
formed through said hammers *R*, and through
which slots pass said pins or screws, said slots 20
or openings being formed, through said ham-
mers, by starting at their center, and termi-
nating short of the outer edges thereof, and
a bell arranged in juxtaposition to said ham-
mers, whereby, when said hammers revolve, 25
an audible signal will be heard, substantially
as described.

In testimony whereof I hereunto affix my
signature, in the presence of two witnesses,
this 17th day of August, 1898.

WILLIAM A. FROECKMAN.

Witnesses:

WM. H. SCOTT,

F. R. CORNWALL.