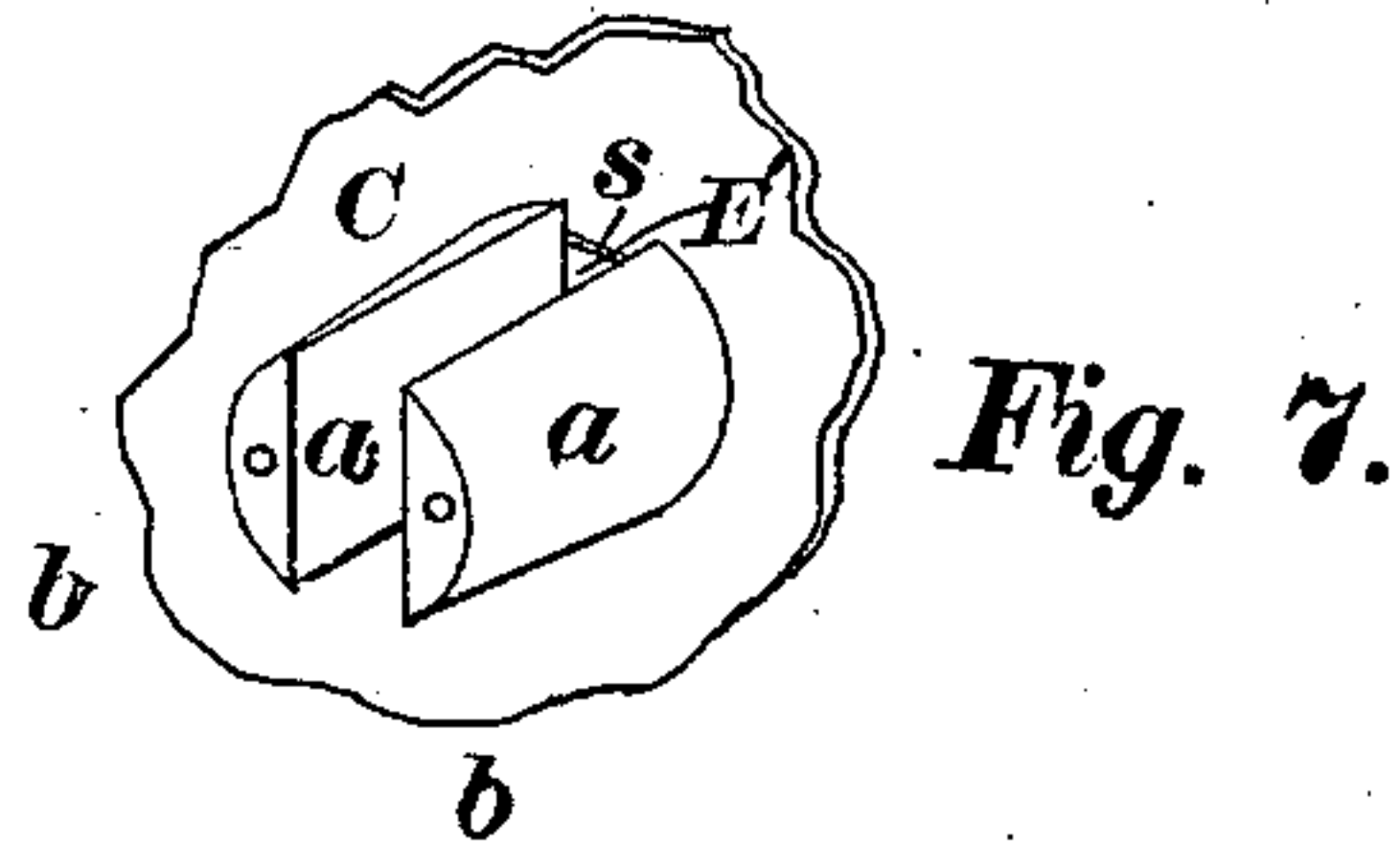
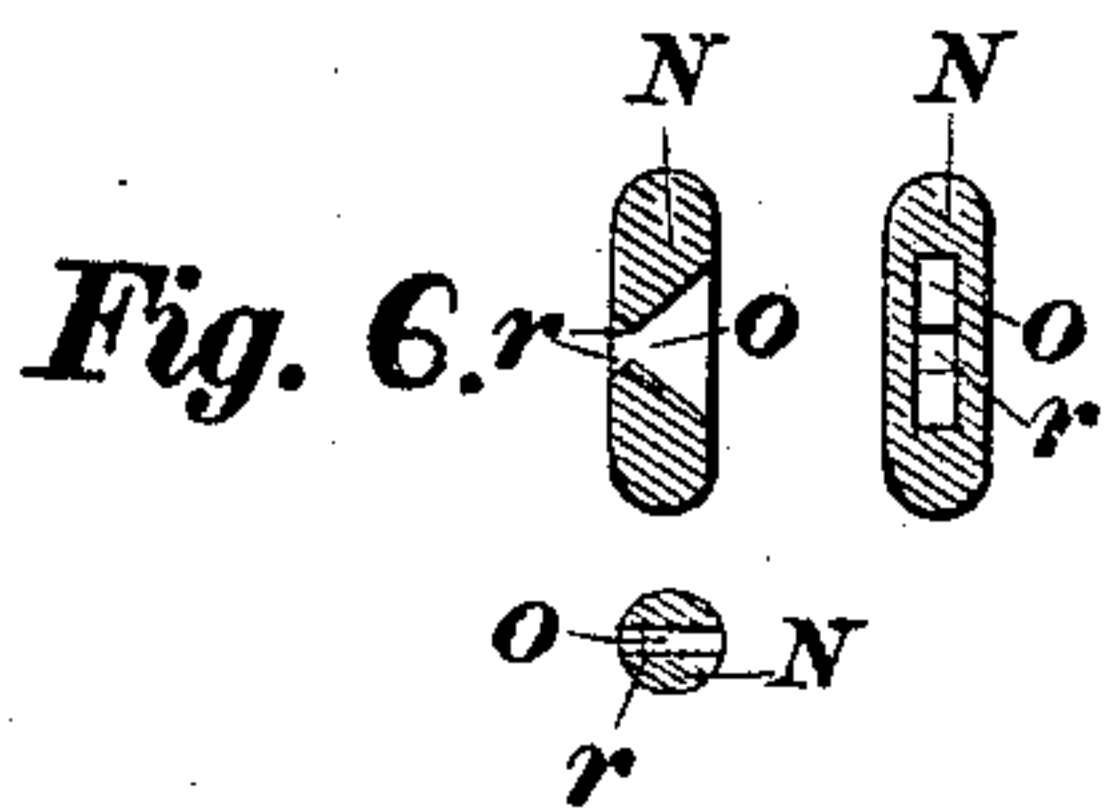
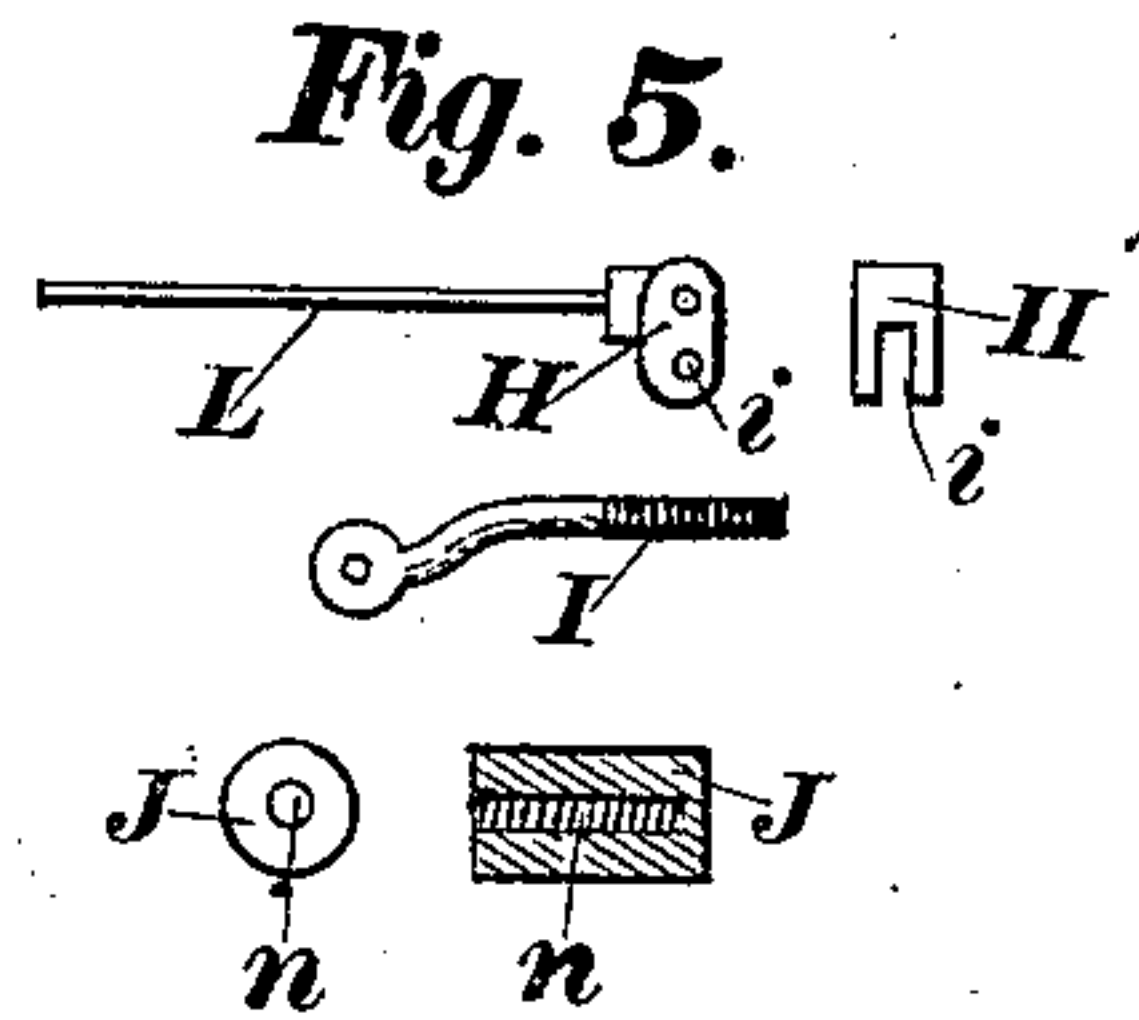
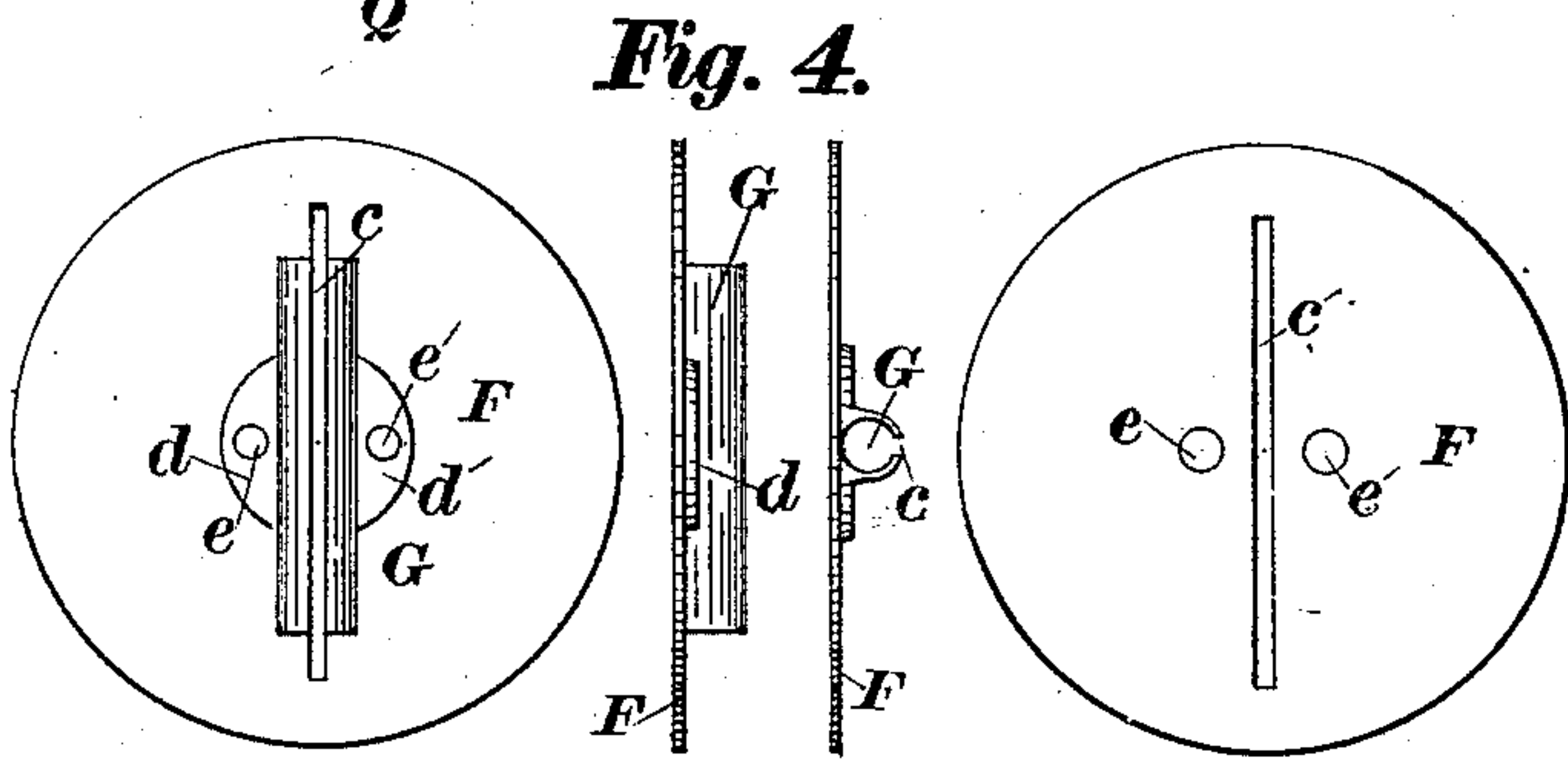
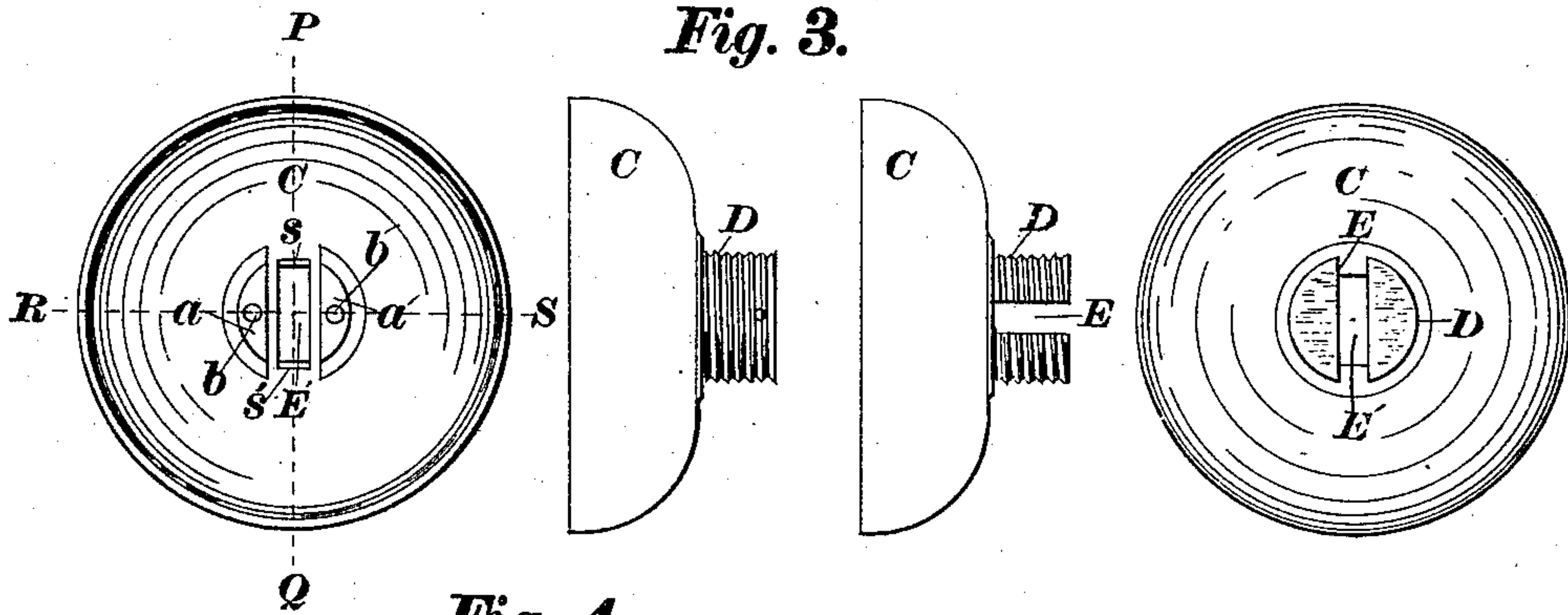
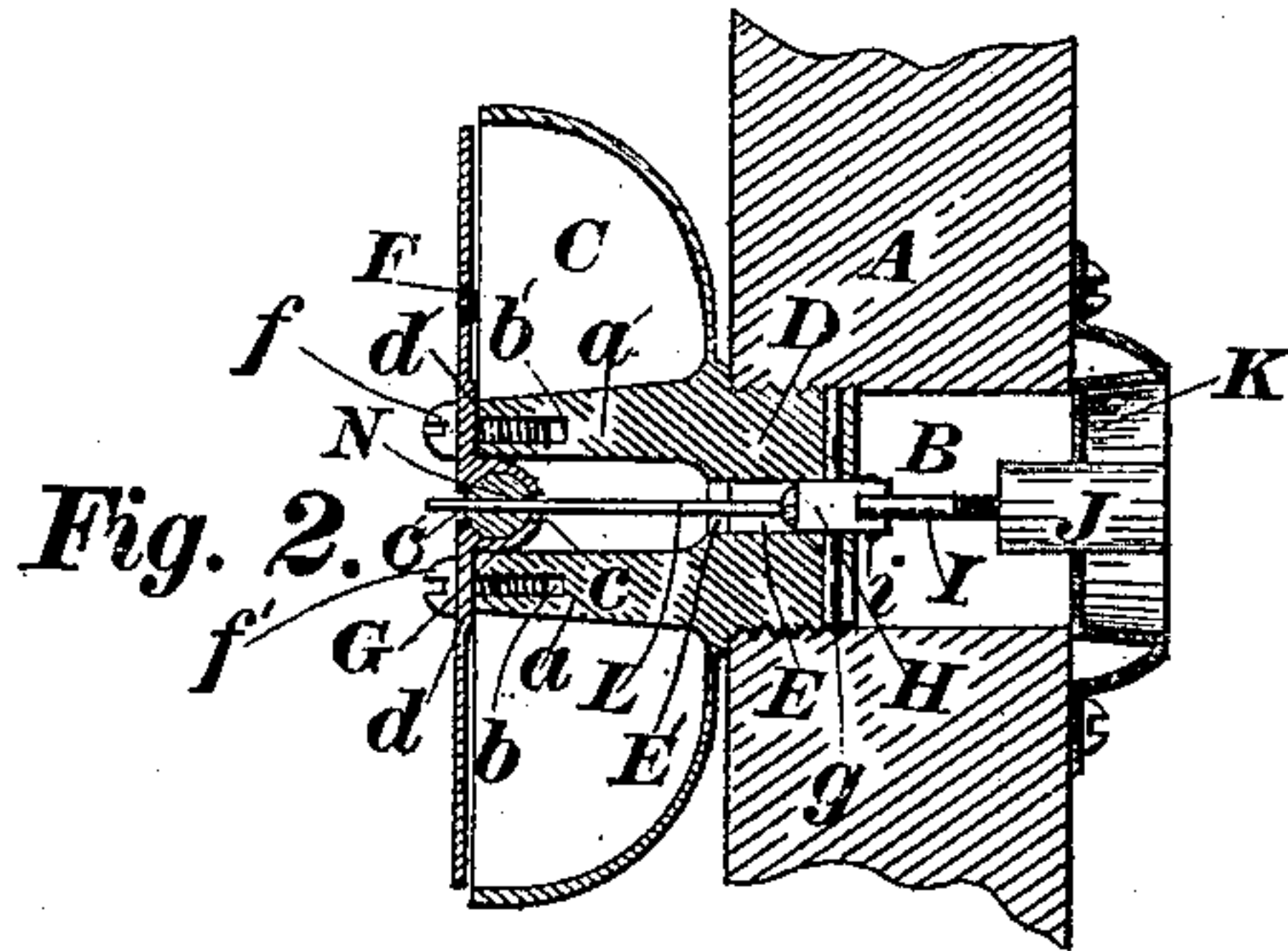
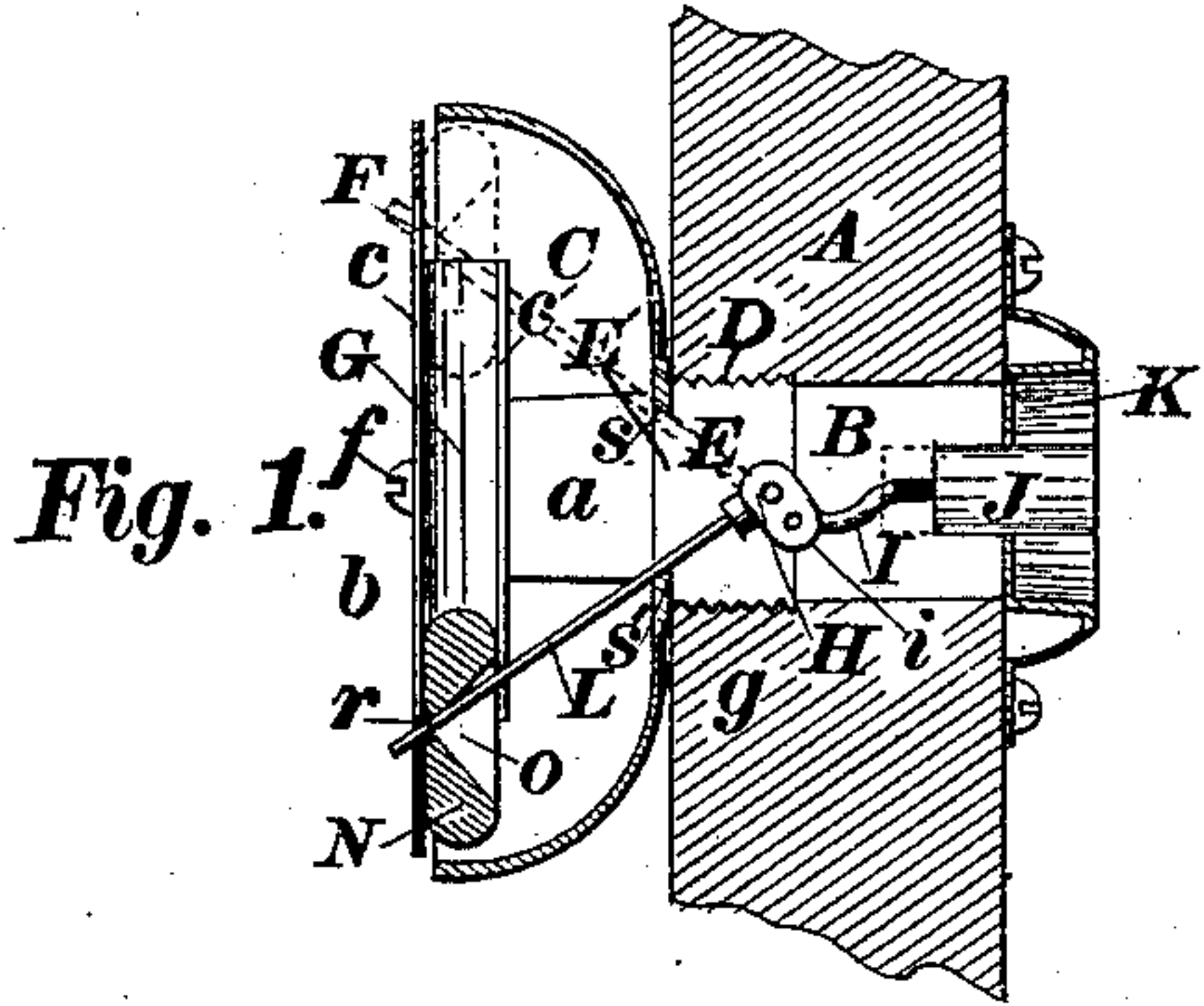


(No Model.)

F. SANDERSON.
DOOR BELL.

No. 428,636.

Patented May 27, 1890.



Witnesses
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Frank H. Finner

Inventor
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UNITED STATES PATENT OFFICE.

FREDERICK SANDERSON, OF CHICAGO, ILLINOIS.

DOOR-BELL.

SPECIFICATION forming part of Letters Patent No. 428,636, dated May 27, 1890.

Application filed January 31, 1890. Serial No. 338,775. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK SANDERSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Door-Bells, of which the following is a specification.

My invention relates to improvements in that class of door-bells which are attached directly to a door, and are operated by means of a push-button from the opposite side of the door from which the bell is situated.

My objects are to produce a door-bell which is cheaper and more durable than any heretofore placed on the market, by a construction which entirely obviates the use of the ordinary frail springs for operating the hammer, and substitute therefor a vertically-moving hammer which in part is operated by gravity, and in also providing means by which the hammer is movably attached to the vibrating lever which operates it, in combination with a vertically-situated guideway for the hammer, which guideway is so placed within the gong that it permits the hammer to strike two direct blows on the gong at a right angle to the surface struck for every inward push upon the push-button; also to provide an adjustable connection between the push-button and the striking mechanism, by which the gong can be quickly adjusted to various thicknesses of doors found in practice, and to provide means by which the push-button is always stopped in a normal position without the usual shoulder on the button.

Another object is the introduction of a means for cheaply, quickly, and efficiently attaching the bell to a door by inverting the position of the gong in reference to the door as usually applied, and providing a projection at the back of the gong, at its center, for the purpose of an attachment.

Another object is the application of a cover to the open side of the gong to cover the operative parts, and also to act as an attachment for the hammer-guideway, as will be hereinafter explained.

A further object is a simplification of all the parts and an adaptation to modern processes of manufacture, so that as an article

of trade it can be placed on sale at a price within the reach of people of very limited means.

I attain these objects by the construction shown in the accompanying drawings, in which—

Figure 1 is a vertical center section of the gong on line P Q, Fig. 3, showing gong, door, and the hammer and hammer-guide in position, together with the other operative parts in perspective. Fig. 2 is a transverse center sectional view, on line R S, of the gong, Fig. 3, showing door, gong, hammer, hammer-guide, and cover-plate for gong, together with the other operative parts in perspective. Fig. 3 shows, respectively, from left to right, inside, side, top, and outside rear views of the gong. Fig. 4 shows, respectively, from left to right, inside, side, top, and outside views of the bell-cover and hammer-guide. Fig. 5 shows detached views of the operative parts, with central longitudinal section of push-button. Fig. 6 shows views of the construction of the hammer. Fig. 7 is an isometric perspective view showing posts to which the gong-cover is attached, the gong being broken away.

As usually constructed and attached to a door, A is a section of the door, which has a round hole B bored through it from side to side.

C is the gong, which in this instance has a cylindrically-shaped screw-threaded projection D at its rear side at the center. This projection is slotted at E clear through, as shown in the third view, Fig. 3, and the slot E is continued through to the inside of gong C, forming a mortise in the center of the gong, (shown by letter E', Figs. 1, 2, and 3.) There are two posts *a a'*. (Shown in Figs. 1, 2, and 7.) These posts stand out from the inside central part of the gong C—one on each side of the mortise E'—and the outer ends of these posts are even with the outside rim of the gong C, Fig. 2. The outside ends of the posts *a a'* have screw-threaded holes *b b'*, Figs. 2 and 7.

F is the cover-plate of the open side of gong C, and this cover-plate has a tubular projection G attached on the inside surface, and the position of the tube is central and longi-

tudinal direction vertical, as shown in Figs. 1, 2, and 4. Throughout the whole length of the tube is a slot *c*, and in the cover *F* is another slot *c'*, longer than the tube *G*, (first and fourth view, Fig. 4,) which slot *c'* also cuts into the tube *G* throughout its length, but opposite to slot *c*.

At *d d'* are two raised places on the inside of cover-plate *F*, through which are two holes *e e'* for screws *f f'*. The outside diameter of the tube *G* is the same as the distance between the posts *a a'*. The cover-plate *F* is firmly secured to the posts *a a'* by means of screws *f f'*, which pass through the holes *e e'* of the cover-plate and into the holes *b b'* in the ends of the posts *a a'*.

The sides of the tube *G* fit closely between the ends of the posts *a a'*, Fig. 2, so that when the cover-plate is in position, Fig. 2, and firmly screwed down it cannot have any movement in any direction to throw the slots *c c'* out of line with the operative mechanism, which will now be described.

The elbow-lever *II*, Figs. 1, 2, and 5, is pivoted on a pin *g*, Fig. 2, in the slot *E* of rear projection *D* of the gong *C*.

The short arm *i* of elbow-lever *II* is slotted at its lower end, and in this slot is pivoted on a pin one end of a pitman *I*. The other end of pitman *I* is threaded along for some distance from the end, and this threaded end engages the threaded hole *n*, Fig. 5, in the center of the push-button *J*. The push-button *J* slides in a hole in the center of the escutcheon *K* and protrudes on the opposite side of the door from the gong *C*.

The long arm *L* of the elbow-lever *II* is made of small diameter, so as to fit loosely in the slots *c c'* of the hammer-guideway *G*, through which it passes and in which it operates, and it is also made of small diameter, so as to have a slight degree of elasticity, as will be hereinafter explained. The length of the spring-arm *L* is such that it extends out through the slot *c'* of the cover-plate *F*, as shown in Figs. 1 and 2.

The body of the hammer *N* (shown in detail in Fig. 6) is cylindrical, and the ends terminate in a hemispherical shape. At the center of length and diameter is a slot *o*, which is cut entirely through the hammer from side to side; but the slot is longer on one side than the other, as shown. This slot *o* in the hammer permits the arm *L* of elbow-lever *II* to pass entirely through the hammer, and contacts only at the points *r* of the slot *o*, there being clearance both at the sides and ends of the slot. The arm *L* operates the hammer, and since this arm *L* has a motion on the segment of a circle with the pivotal bolt of the elbow-lever *II* as the center, this method of connecting the hammer to its driving-lever *L* permits the hammer to move in a straight line with very little friction, the lever *L* sliding through the slot *o* in and out to suit its varying length relative to the hammer when making an upward or downward stroke.

The diameter of the hammer *N* is slightly smaller than the diameter of the tube *G* of the cover-plate *F*, into which tube the hammer is made to slide vertically by the action of arm *L*, the hammer striking the bell both at the top and bottom of its stroke, as will be explained. There are shoulders *s* and *s'*, that form the upper and lower terminus of the mortise *E'*, Fig. 1 and first view Fig. 3, and these shoulders act a double purpose: first, they are stops to limit the inward and outward motion of the push-button *J* by limiting the vibratory motion of the arm *L*, and these shoulders *s s'*, by limiting the stroke of the arm *L*, act as fulcrums upon which the spring-arm *L* bears when it acts as a retracting-spring to withdraw the hammer *N* from contact with the gong *C* after the hammer has delivered a blow on the gong *C* at either the upper or lower stroke, as will be more fully explained.

The gong *C*, instead of having its open side next to the door, as is the case with ordinary door-bells, is inverted, its convex side being next the door, as is shown in Figs. 1 and 2. In the drawings is shown a cylindrical projection *D*, which is threaded, to be screwed into a hole *B*, bored through the door; but other forms of attachment embodying this same principle can be employed without changing the principle of this new form of attaching the gong of a door-bell to the door. Confining this description, however, to this particular device for attaching the gong to the door, it is obvious that by screwing this projection *D* into the hole *B* of the door a thread will be cut in the wood, and when the projection is screwed in until the shoulder next the bell is in contact with the door a perfectly-secure attachment will be easily and quickly made without in the least destroying the resonance of the gong *C*, as shown in Figs. 1 and 2.

On the outside of the door is an escutcheon *K* to cover the hole *B* and to support and guide the push-button *J*. Before the projection *D* is screwed into the hole *B* the pitman *I* and push-button *J* are attached to the elbow-lever *II*, and after the attachment of the gong to the door is made the push-button *J* will project on the opposite side of the door. The button *J* is placed in the hole in the center of the escutcheon, and the escutcheon is pressed up to the face of the door, and should the outer end of button *J* fail to stand even with the outer face of the escutcheon the button can be easily screwed inward or outward, as required, on the screw-threaded end of pitman *I*, until the required position is attained to suit the thickness of the door. Doors vary considerably in thickness, so that this means of adjustment saves much time on the part of the bell-hanger, which of course reduces the cost of introducing door-bells of this construction.

To operate this door-bell, the button *J* is pushed in, which causes its connected pitman

I to partially rotate the elbow-lever H, the long arm L partaking of this motion, and its outer end passing through and being engaged with hammer N causes the hammer to be
 5 lifted vertically until the arm L strikes the upper shoulder s, Figs. 1 and 7, at the top end of slot E, when the momentum of the hammer bends the arm L and the hammer strikes the
 10 gong a direct blow, as shown by the dotted lines in Fig. 1. It is obvious that if the arm L is bent over the shoulder s at the instant the hammer contacts with the gong the elasticity of arm L will retract the hammer as
 15 soon as it has struck, and thus not interfere with the resonance of the gong. If the push-button is instantly released after being pushed in, the gravity of the hammer will cause it to descend down the tube G, carrying arm L with
 20 it, until it strikes the gong at the bottom. In the downward stroke of the hammer the arm L contacts with the lower shoulder s' of the mortise E', and the momentum of the hammer bends the arm L over the shoulder s' as a fulcrum until the hammer strikes the gong C,
 25 when the hammer by the elasticity of arm L is instantly withdrawn and held away from the gong C in the position shown in Fig. 1. Thus it will be seen that two strokes can be quickly made upon the gong by pressing and
 30 releasing the push-button once and a great many strokes made almost instantly without the usual complication of frail springs and levers, which are both costly and subject to frequent repairs.

35 I claim as my invention—

1. In a door-bell, a vertical hammer-guide G, supported by plate F, as shown and described, hammer N, operating in said vertical
 40 guide G, said hammer N having a slot o, arranged as described, spring-arm L, operating in said slot o, and elbow-lever H, operating said

spring-arm L by pressure on button J through pitman I, for the purpose described.

2. In a door-bell, the vertical mortise E' right through the central part of the gong C and
 45 longitudinally through threaded projection D, forming a slot E in threaded projection D, elbow-lever H, pivoted and operating in said slot E in projection D, and spring-arm L of said
 50 elbow-lever H, operating vertically and longitudinally in said slot E, in combination with hammer N, operating in guideway G, pitman I, and adjustable press-button J, for the purpose described.

3. In a door-bell, the posts a a', attached at
 55 their base to the central inside portion of the gong C, and cover F, attached to the tops of said posts a a', said posts a a' to straddle and fit closely the outside of guideway G, in the
 60 manner and for the purpose described.

4. In a door-bell, a vertical hammer-guideway G, secured to cover-plate F, said guideway G provided with longitudinal slots c and
 65 c', hammer N, provided with slot o, spring-arm L of elbow-lever H, operating in said slot o and longitudinally in said slots c and c' of said guideway G, and elbow-lever H, pivoted and operating in slot E of rear projection D, in combination with pitman I and adjustable
 70 push-button J, all operating for the purpose described.

5. In a door-bell, a cover F, in combination with a vertical hammer-guideway G, attached to said cover F, said cover F being secured to
 75 posts a a', said posts a a' being secured to the central inside portion of gong C, for the purpose described.

FREDERICK SANDERSON.

Witnesses:

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 JOSEPH A. MILLER.