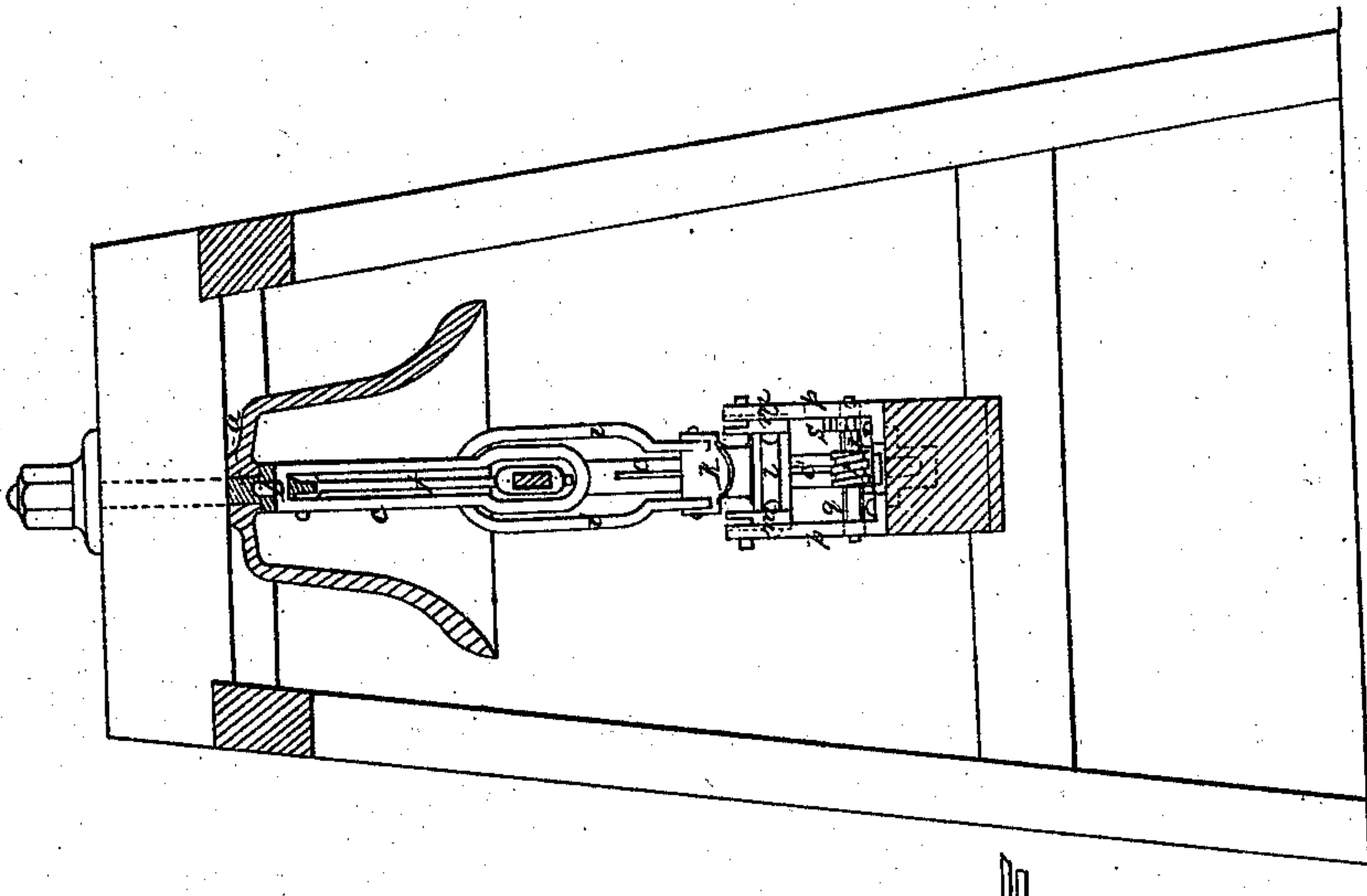


*L. Holmes*  
*Alarm Bell.*

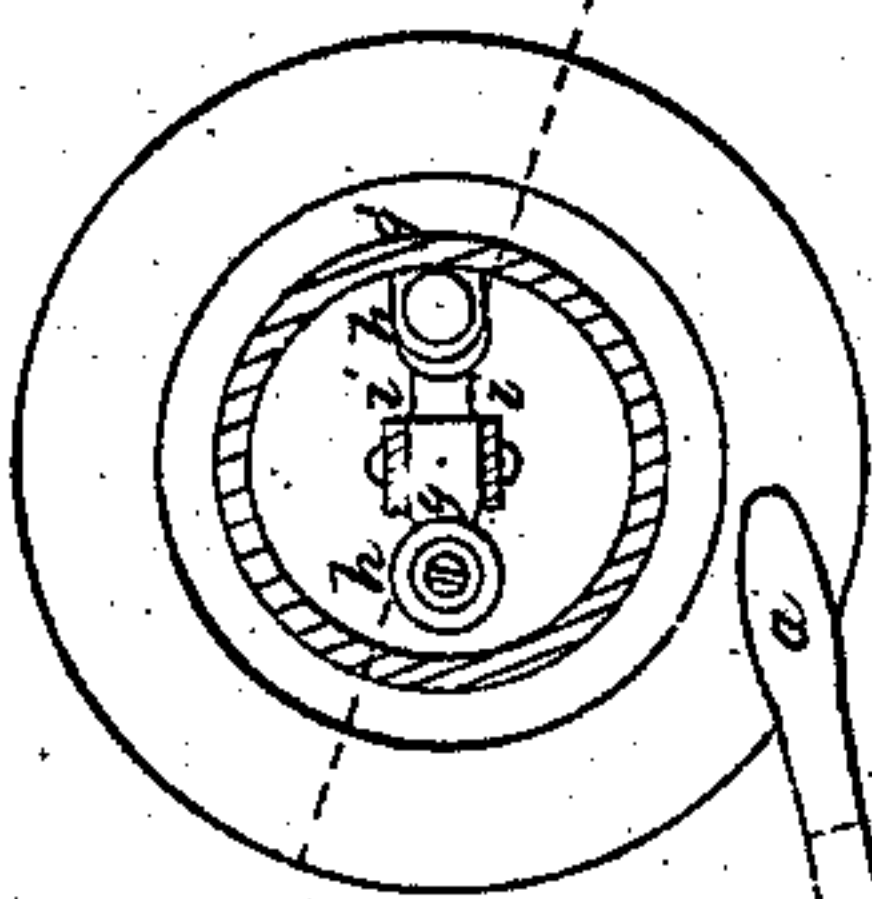
*Nº 90,173.*

*Patented May 18, 1869.*

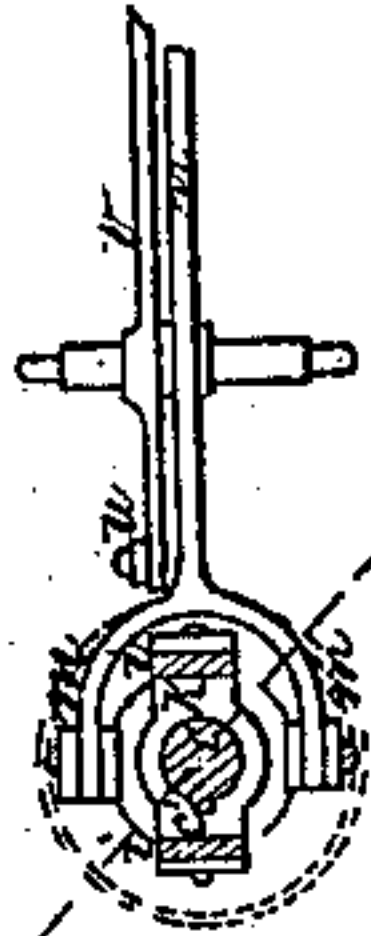
*Fig. 2.*



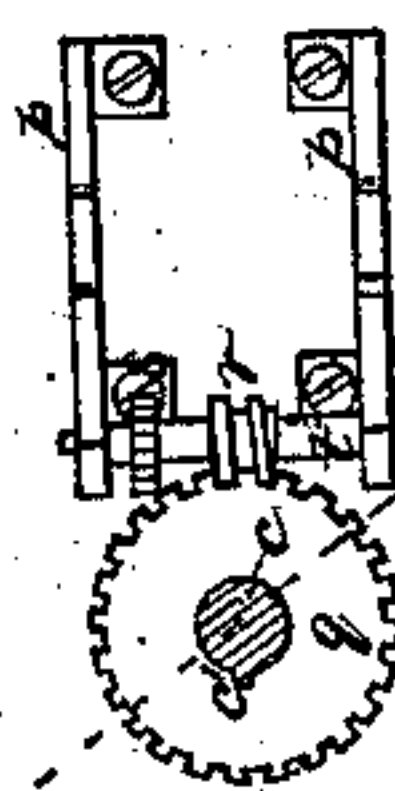
*Fig. 3.*



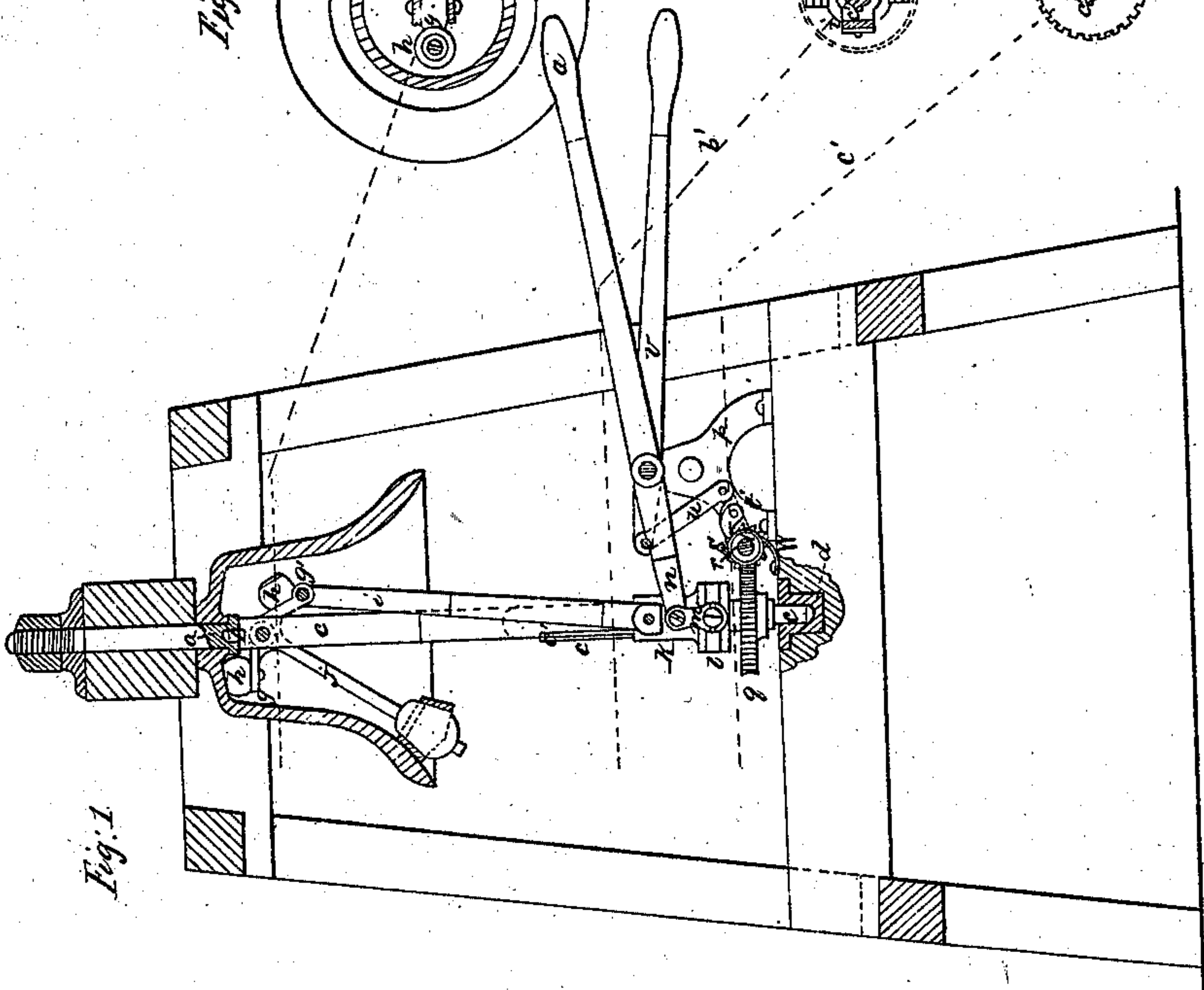
*Fig. 4.*



*Fig. 5.*



*Fig. 1.*



*Witnesses;*  
*George M. Van Hook*  
*John M. Van Hook*

*Inventor;*  
*Laurence Holmes.*



# United States Patent Office.

LAWRENCE HOLMS, OF PATERSON, NEW JERSEY.

Letters Patent No. 90,173, dated May 18, 1869.

## IMPROVED ALARM-BELL.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern :

Be it known that I, LAWRENCE HOLMS, of Paterson, in the county of Passaic, in the State of New Jersey, have invented certain new and useful Improvements in Ringing Alarm-Bells; and I hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the figures and letters of reference marked thereon, and making a part of this specification, in which—

Figure I is a sectional elevation.

Figure II, a sectional elevation at right angles to Fig. I.

Figure III, a horizontal section, taken on the line *a'*.

Figure IV, a horizontal section, taken on the line *b'*.

Figure V, a horizontal section, taken on the line *c'*.

Like letters in the several figures refer to like parts.

The principal object of my invention is the prevention of the breakage of bells. This I accomplish by the mechanism to be hereinafter described, compelling the hammer, or clapper to travel around the perimeter of the sound-bow of the bell, and deliver its blows progressively thereon. This movement may be given to the hammer either regularly, at every stroke of the hammer, or intermittently, at the option of the ringer.

It is well known that blows delivered for any considerable length of time upon the sound-bow of a bell in one or two places, will not only change the form of the bell from a circular to an elliptic, but will crystallize the parts where struck into a mass so foreign to the main body of the metal, that desintegration and fracture, and the consequent destruction of the bell, must ultimately ensue.

Another object of my invention is to produce a more sonorous vibration in the metal of the bell, and to prevent the abrasion of the surface of the sound-bow by the repeated strokes of the hammer. Those objects I attain by arming the hammer with hard wood, or other similarly semi-elastic substance, and forming the same of a contour corresponding to the sectional profile of the sound-bow of the bell.

I secure my fire-alarm bell in the usual manner, to a strong timber in the frame-work, or bell-tower, by the bolt *a*, which has a socket in its lower end, for the reception of the pivot *b* of the spindle *c*, the spindle *c* being free to revolve therein.

The lower end of the spindle *c* is pivoted in, and supported by the step *d*, which rests in the strong cross-timber *e*, underneath the bell.

The lower portion of the spindle *c* is cylindrical, and the upper portion slotted, or open, for a distance equal, at the least, to the length of the shank of the hammer or clapper *j*, which is suspended to, and swings in the frame-work formed by the opening in the spindle *c*.

Upon the upper end of the clapper-shank *j*, I form a cross-piece, *g g'*, for the purpose of fastening thereon the springs *h h'*, a circular plate being formed upon

the extremity of each arm, upon which the springs may rest.

At the end of the arm *g'* is a double joint, to which are attached the rods, or connecting-links *i i*, which, being moved up and down by the mechanism hereinafter described, give motion to the hammer.

The hammer *j* is of the pendulous kind, and swings to and fro through the opening in the spindle *c*, in which it is suspended, striking either one side only, or both sides of the bell, at the will of the ringer.

A slot, or mortise is formed through the striking-part of the hammer, in the direction of its motion, for the reception of a piece of lignumvitæ, or other hard wood, which constitutes the striking-faces of the hammer. I form the faces to a curve, corresponding to that of the sound-bow of the bell, so that the hammer may give its blow to a deeper segment than can be given by the usual spherical hammer.

The wood is secured into the hammer-head by means of a recessed mortise, into which it is locked by wedges of the proper form.

The links *i i* are jointed to the sleeve-piece *k*, which has lugs formed for their reception.

The sleeve *k* is free to slide up and down upon the spindle *c*, and to revolve therewith, being carried around by the feather *c'*, which fits into a corresponding groove in the sleeve *k*.

A swivel-collar, *l*, embraces the sleeve *k*, and fills the groove near its lower end, and within which the sleeve is free to revolve, the collar remaining stationary.

Upon the collar *l* are two projecting studs, upon which the lower ends of the links *m m* are jointed, the upper ends being attached to the arms of the forked lever *n*, by proper pins, or studs.

The forked lever *n* has its fulcrum in the standards *p p*, and receives its motion directly at *o*, or indirectly, by any system of rods or levers, necessary to communicate motion from a distant part, by the hand of the bell-ringer.

The lever *n o* being moved up and down, the sleeve *k*, to which it is attached by the links *m* and collar *l*, will be raised and lowered on the spindle *c*.

The links *i i* being attached to the sleeve *k*, and the cross-arm *g'*, a vibratory, or pendulous motion will be given to the hammer, which will thus be swung from side to side of the bell.

The India-rubber springs *h h'* impinge, or cushion, against the crown of the bell, and tend to throw back the hammer after it has delivered its blow.

They also afford ready means of adjusting the amount of resistance best suited for the purpose, and obviate the disagreeable clatter usual where steel springs are used, whereon the shank of the hammer strikes.

A tangential, or worm-wheel, *q*, is fastened near the lower end of the spindle *c*, for the purpose of giving rotary motion thereto.



The worm *r* and ratchet-wheel *s* are fast on the shaft *t*, which has its journal-bearings in the standards *p p*. A lever, *t'*, swings loosely on the shaft *t*, and carries a click, or pawl, which gives motion to the ratchet-wheel *s*, the worm *r*, worm-wheel *q*, and spindle *c*.

The link *u* connects the lever *t'* and lever *v*, which latter, either separately, or united with the lever *n*, gives the necessary rotary motion to the several parts of the mechanism heretofore described.

A detent spring, or catch *w*, prevents the return of the ratchet-wheel, when being operated by the catch, or pawl on the lever *t'*.

I claim, in ringing alarm and other fixed bells, the combination of the rotating spindle *c*, with the swinging hammer, all constructed and arranged substantially as shown and described.

I claim, in ringing alarm and other fixed bells, in combination with a rotating spindle and swinging-hammer suspended therefrom, the sliding sleeve *k*, feather *c'*, links *i i*, swivel-collar *l*, links *m m*, and forked lever *n*, substantially as and for the purposes shown and described.

In ringing alarm and other fixed bells, and in com-

bination with a rotating spindle and swinging hammer suspended therefrom, substantially as described, I claim, the tangential, or worm-wheel *q*, worm *r*, ratchet-wheel *s*, lever *t* and pawl, link *u*, and lever *v*, for the purpose of giving rotary motion to the spindle *c* and hammer *j*, either together with, or independently of the ringing-mechanism, substantially as shown and described.

I claim, in combination with a bell-hammer, the cross-arms *g g'*, and springs *h h*, substantially as and for the purposes shown and described.

I claim, making the striking-faces of a bell-hammer of a curvature corresponding in reverse to that of the sound-bow of the bell, substantially as and for the purposes shown and described.

I claim, arming a bell-hammer with hard wood, or other semi-elastic material, substantially in the manner shown and for the purposes described.

LAWRENCE HOLMS.

Witnesses:

GEORGE M. VAN HOSSEN,  
JOHN W. VAN HOSSEN.