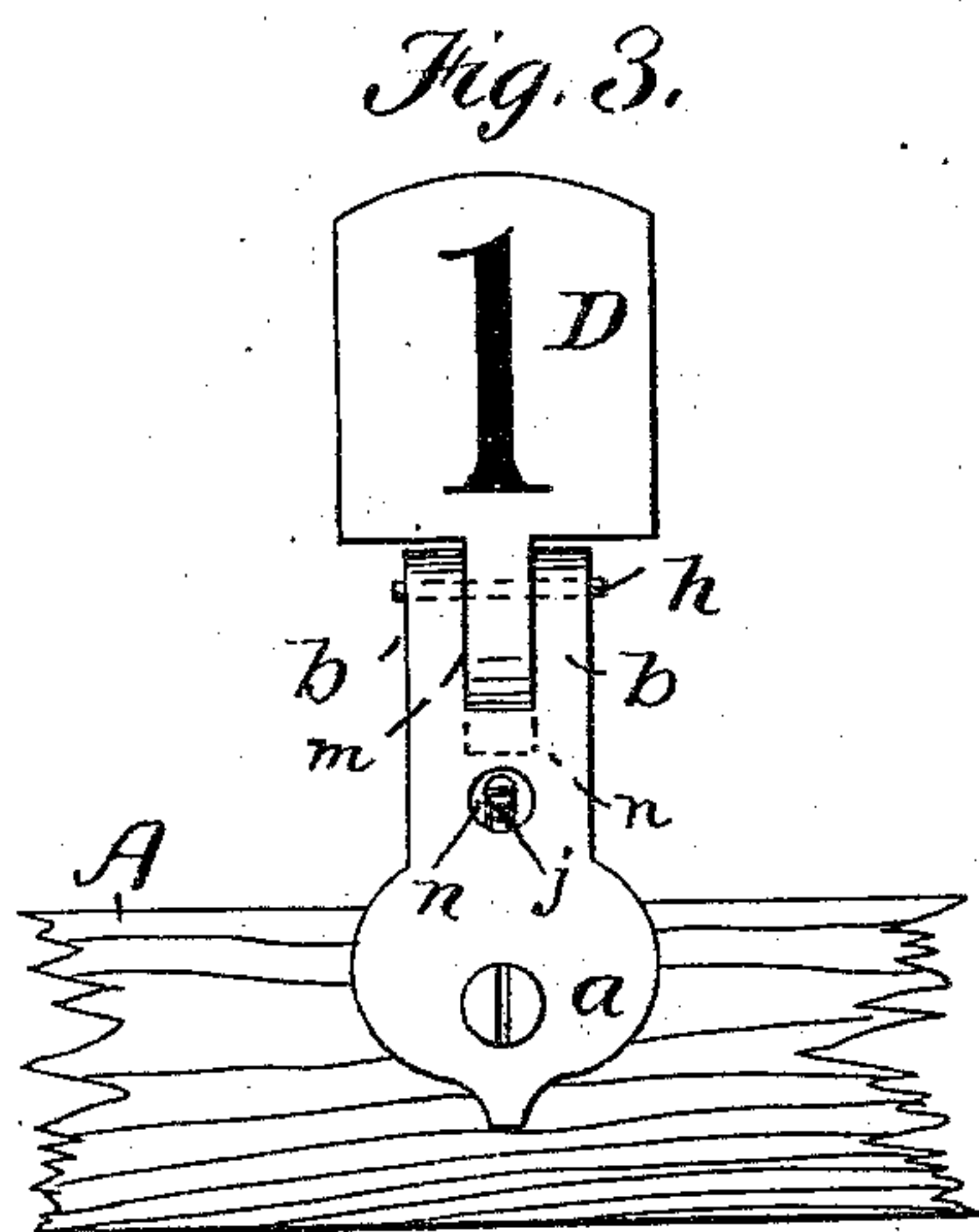
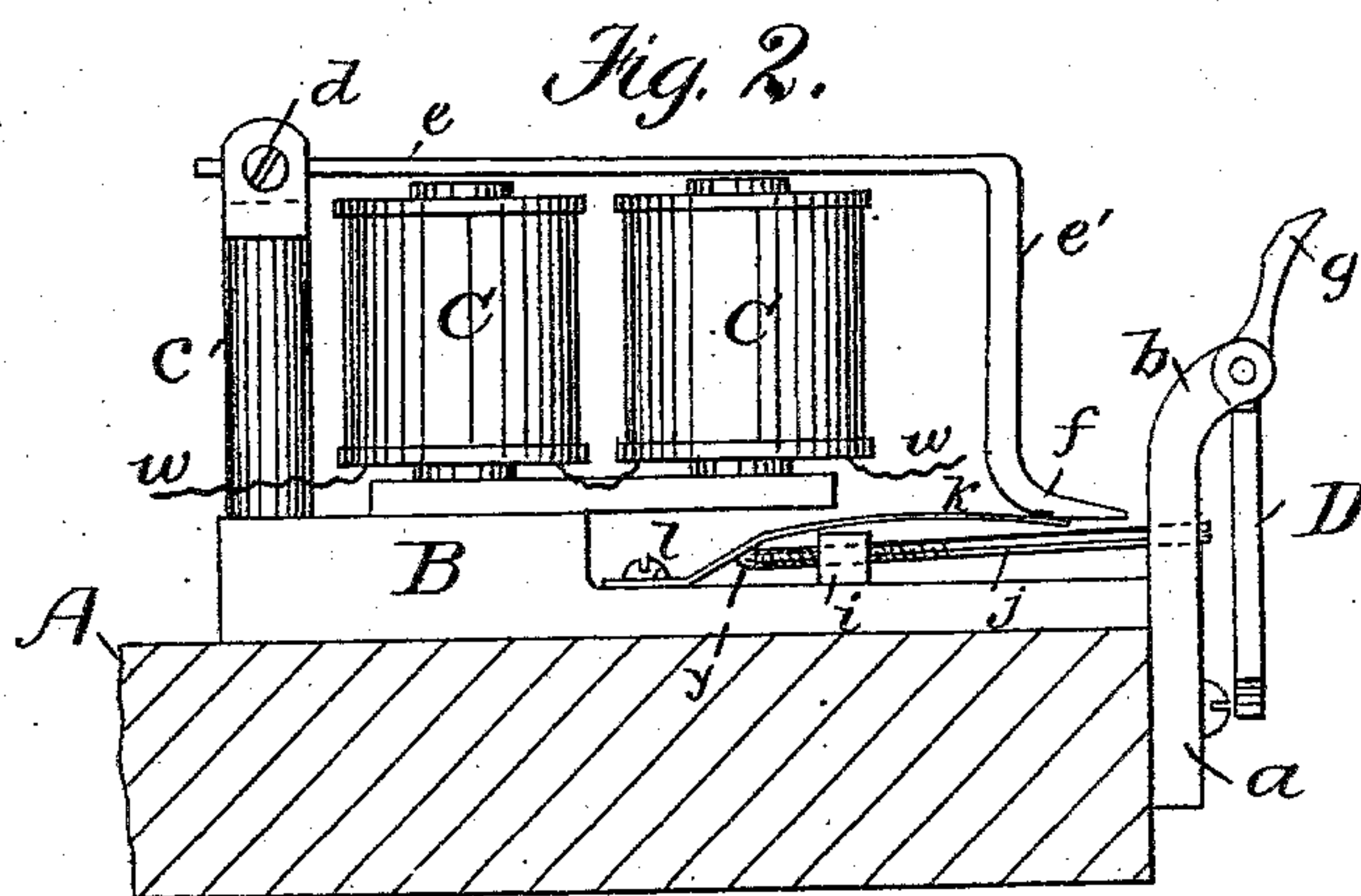
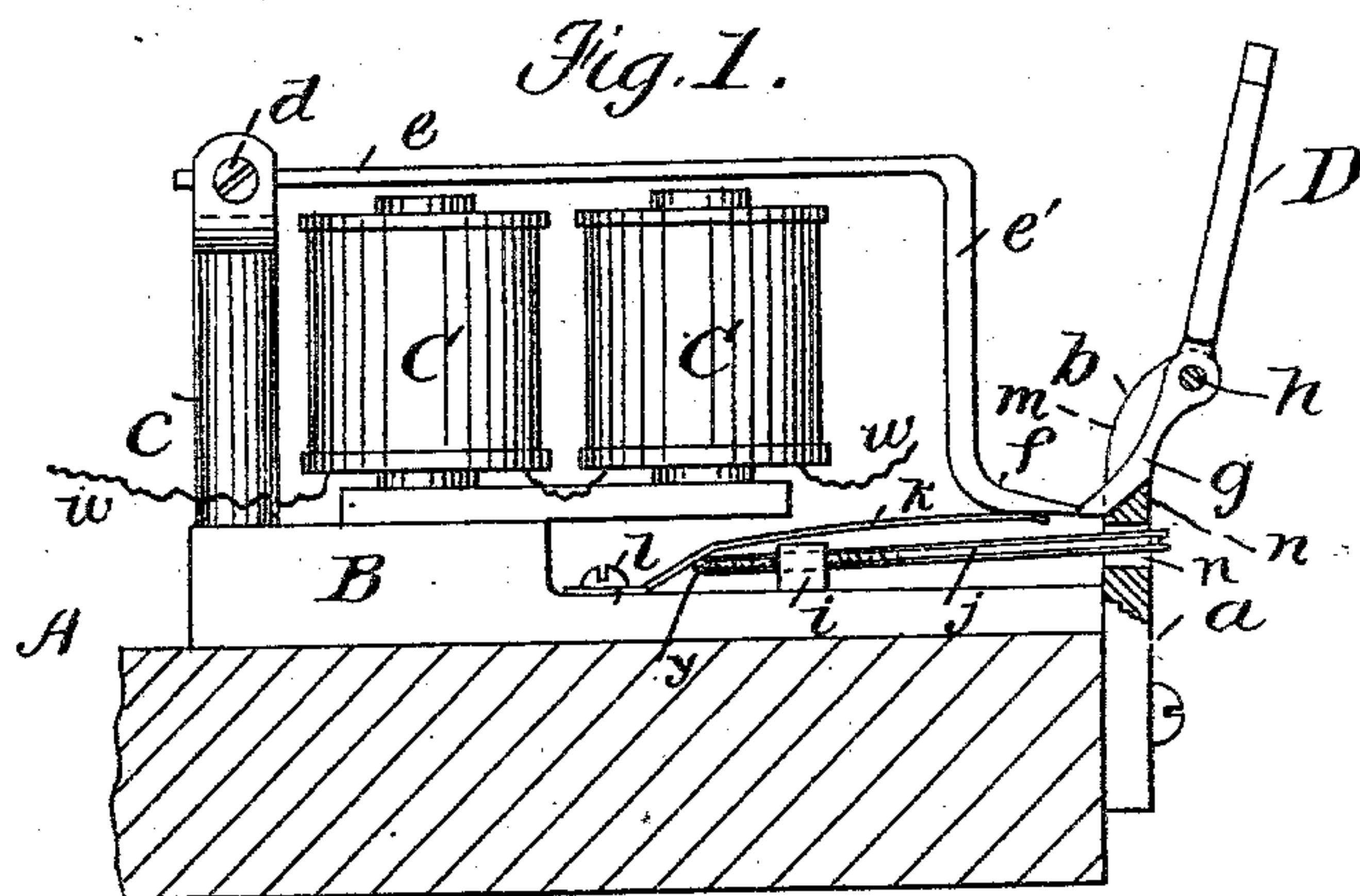


(No Model.)

E. FLINT, Jr.
ELECTRIC ANNUNCIATOR.

No. 283,590.

Patented Aug. 21, 1883.



Witnesses.

Philip Mauro
C. J. Hedrick

Inventor,

Edward Flint Jr.
by *A. Folger*
his attorney.

UNITED STATES PATENT OFFICE.

EDWARD FLINT, JR., OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE
AMERICAN BELL TELEPHONE COMPANY, OF SAME PLACE.

ELECTRIC ANNUNCIATOR.

SPECIFICATION forming part of Letters Patent No. 283,590, dated August 21, 1883.

Application filed May 28, 1883. (No model.)

To all whom it may concern:

Be it known that I, EDWARD FLINT, Jr., of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Electric Annunciators, of which the following is a specification.

This invention constitutes an improvement in electric annunciators in which an electro-magnet is employed to release a drop or target, causing the same to fall and disclose the number thereon; but the target or drop may be an obscuring shield or shutter, which, being removed, exposes the numeral or other indicating device, such annunciators being well adapted for use in connection with telephones, and to give the signal to the operator of a central office or telephone-exchange. The instrument which I am about to describe is, however, well adapted also for incorporation with a combined system of calling-annunciators, such as those used in hotels.

The object of my invention is to produce an annunciator of extreme simplicity and economy in construction, comprising but few component parts, easy to be adjusted, and yet capable of very delicate adjustment, and, finally, capable of responding to a very weak calling-current. In my improved annunciator the adjustments are also of the simplest character, their entire arrangement being controlled by a single screw, which is placed at the front. This is most important in a telephone-exchange annunciator, seeing that they are usually, when in place, so disposed as to be close together, leaving very little room for commodious handling. It is thus desirable that all changes in adjustment may be made from the front.

In my annunciator I employ, as usual, an electro-magnet and armature therefor, the said electro-magnet being secured to a suitable base-board of any convenient non-conducting material. Its armature is pivoted to a standard in the rear, and extends forward over both magnet-poles at the extreme front of the electro-magnet, bending downward at a right angle, and then again forward, thus forming a foot projecting outwardly, and adapted to serve as a detainer for the shield or drop, which is provided with a heel extending inwardly and

engaging with the said foot. The armature is kept normally retracted away from the magnet-cores by means of a flat spring, which supports the foot of the armature-lever and presses it upward, the tension of said spring being adjustable by a single screw, the head of which projects forward below the drop. This screw is caused to bear upon the retracting-spring, near its fixed end, and thus exercises considerable leverage thereon, so that a very small turn of the screw produces a comparatively large movement of the spring. The heel of the target, shield, or drop is placed below the pivot or fulcrum, and normally the target stands in an almost vertical position, but leaning a little forward, so that when it is released by the disengagement of the heel of the drop its tendency is to fall forward.

The foregoing general description will readily be understood by reference to the accompanying drawings, and it will be seen that a large portion of the weight of the target rests normally upon the foot of the armature-lever in such a manner that if the said foot is depressed the target, being left unsupported, must necessarily fall forward and give the designating-signal.

In the accompanying drawings, Figure 1 is a side elevation of my improved annunciator, a portion of the target-standard being broken away more clearly to show the working of the parts. Fig. 2 is a similar side view, but with the target or drop fallen; and Fig. 3, a front end view, showing the annunciator as it appears before being operated.

It is usual, for convenience, to paint the designating-number on both sides of the drop, so that it can be seen whether the said drop be fallen or upright. As shown in the drawings, the electro-magnet C, the cores of which are, as usual, united together by a soft-iron yoke-piece, are mounted upon a suitable base, B, the entire instrument being fixed upon a board or shelf, A, which may, if desired, be common to a number of annunciators. The armature *e* is pivoted at one end, by its axis *d*, to the standard *c*, and, extending forward over the magnet-cores, is provided with a forearm, *e'*, this again having a forwardly-projecting foot, *f*. The base B is cut away in front, the elec-

tro-magnet yoke being fastened thereon by its hinder part alone, and at the extreme front thereof it terminates in a T-head or two-way standard, the end projecting downwardly being fastened by a screw to the shelf A, and the end *b*, which projects upward, being slit, as at *m*, for the reception of the fulcrum and heel of the drop-signal or target D. The said drop is pivoted, at *h*, on a pin crossing the slit between the two lugs *b b* of the supporting-standard, and has a downward extension or heel, *g*, which, when the signal is in its normal condition and quiescent, the target being elevated, passes through the slit *m* and engages with the foot *f* of the armature-lever, as shown in Fig. 1. The heel *g* projects farther in a downward direction than the front part of the slit *m*, and thus, when the target D is elevated and at rest, bears against the inner face, *n*, of the front standard, *a b*, as shown in dotted lines in Fig. 3. Thus the target is prevented from falling forward by the engagement of its heel with the foot *f* of the armature-extension, and it is held a little forward of a vertical position and prevented from falling backward by the bearing which the front side of the said heel has upon the inner beveled face *n* of the standard *a b*. The only adjustment required is furnished by the spring *k*. This is fixed at one end to the depressed portion of the base by the screw *l*, and by means of the regulating-screw *j*, which works in a fixed female screw, *i*, attached to the base, and which passes through the hole *n* in the front standard, its tension can be adjusted to any desired degree. Since the point *y*, at which the end of the adjusting-screw strikes the spring *k*, is so near to the fixed point of the said spring, it is obvious that a very slight movement of the screw affects the elongated free end of the spring to a considerable extent. The spring is maintained sufficiently elastic to keep the armature *e* just as far from the cores as is necessary to allow the foot *f* to meet squarely the heel *g* of the target, and the said foot *f* is bent to such an angle that when the armature is the proper distance from the magnet-cores it will abut against the said heel. The abutting-points of the foot *f* and heel *g* are both made broad enough to admit of any reasonable change in adjustment, so that if currents of variable strength occur the spring may be slackened, allowing the armature to come close to the core, and will then, moreover, oppose a weaker retractive force to the power of the magnet than heretofore, whereby the sensitiveness of the annunciator and its capacity of responding to a weak current are increased. Conversely, by tightening the screw, the ar-

mature is lifted to a greater distance from the cores, and the retractive force is increased, thereby decreasing greatly the sensibility of the annunciator, and preventing it from a too great readiness to respond when currents of unusual strength traverse the magnet-coils. Thus a single adjustment serves both to regulate the distance between the magnet-cores and the armature, and to regulate also the constant retractive force opposing the electromagnetic attraction of the armature.

It is obvious that the drop D, instead of having the designating-numeral on it, may simply act as an obscuring-shield, which, when raised, covers such numeral or indicating device, and on falling exposes the same.

Having fully described my invention, I claim—

1. In an electric annunciator, the combination of an electro-magnet, an armature therefor, provided with a vertical extension and projecting foot, a pivoted target or shield carrying a visual signal, and provided with a backwardly-projecting heel, adapted to engage with the said armature-foot, whereby the target may be maintained in a vertical position, a regulating-spring bearing upon the under surface of the projecting armature-foot, and an adjusting-screw therefor, whereby the tension of the spring is controlled, substantially as described.

2. The combination, substantially as hereinbefore described, in an electric annunciator, of the armature and its extension, the said extension terminating in the projecting foot *f*, with the pivoted drop-signal, adapted to be vertically supported by the engagement of its heel *g* with the said armature-extension foot, and an adjusting device, consisting of a spring and a regulating-screw therefor, the said spring being adjustable as to tension by the screw, and adapted to serve as a limit and a retractor for the said armature.

3. The combination, in an electric annunciator, of the armature *e*, provided with the extension *e'* and the projecting foot *f*, combined with the controlling-spring *k* and the regulating-screw *j*, the said screw being adapted to work in a fixed nut, *n*, and to bear against the spring, near its fixed point, *l*, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 19th day of May, 1883.

EDWARD FLINT, JR.

Witnesses:

GEO. WILLIS PIERCE,
D. E. RICHARDS.