(No Model.)

F. E. FISHER.

ANNUNCIATOR.

No. 413,504. Patented Oct. 22, 1889.

FIG. 1.

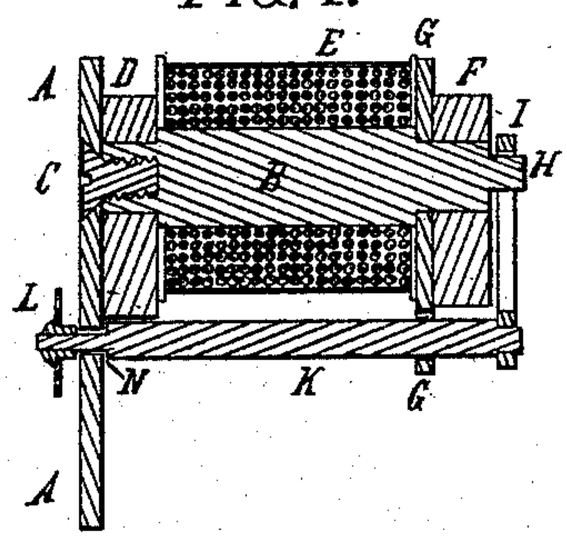


FIG. 2.

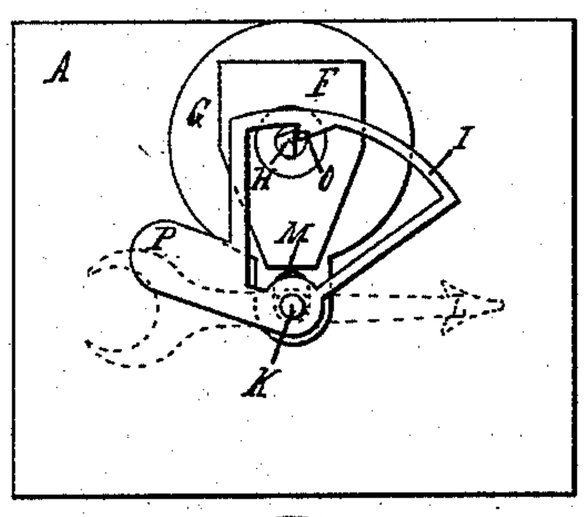


FIG. 3.

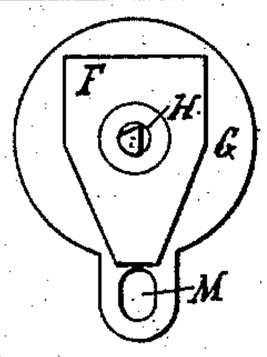


FIG. 4.

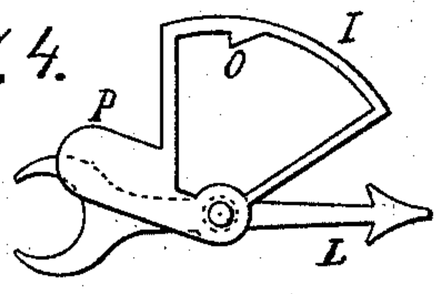
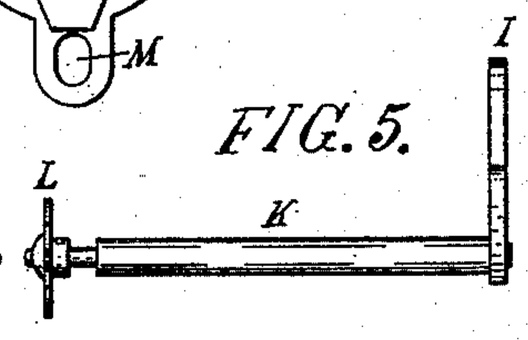


FIG. 5.



WITNESSES:

Cyrus Lothrop

Adelaide A. Anderson

INVENTOR.

Frank E. Fisher

UNITED STATES PATENT OFFICE.

FRANK E. FISHER, OF DETROIT, MICHIGAN.

ANNUNCIATOR.

SPECIFICATION forming part of Letters Patent No. 413,504, dated October 22, 1889.

Application filed June 6, 1889. Serial No. 313,342. (No model.)

To all whom it may concern:

Be it known that I, FRANK E. FISHER, of Detroit, in the county of Wayne and State of Michigan, have invented a new and useful Improvement in Annunciators, of which the following is a specification.

This invention relates to that type of annunciators for which Letters Patent No. 383,566 were issued to me May 29, 1888, and has for its object to provide novel means whereby the indicating-needle can be operated with a feebler current of electricity than where the armature is secured to one end of a rotary shaft. To accomplish this object my invention involves a novel construction and arrangement or combination of devices and principles of operation, which are hereinafter fully described in detail, and specifically set forth in the claims, reference being made to the accompanying drawings, in which—

Figure 1 is a vertical section; Fig. 2, a rear elevation of the rear end of the electro-magnet. Fig. 3 is a rear elevation of the diamagnetic plate and its pole-piece; Fig. 4, a rear elevation of the armature-shaft with needle and frame; and Fig. 5 is a side elevation of the same.

A represents the face-plate of the annunciator, and B represents the core of an electro-magnet, which is secured to the face-plate in any desired way, as illustrated by the screw C.

E represents the bobbin on the core of the electro-magnet, and D F represent two pole-pieces secured to the core B at its ends. The rear end of the core is formed into a detent, as shown at H.

G represents a diamagnetic plate secured to the core B, and having a downward extension, in which is a slot M, Fig. 3.

K represents the axially-oscillatory armature, consisting of a rod or wire of magnetic metal, journaled in a hole N in the face-plate A and in the slot M in the diamagnetic plate G. On one end of the armature K is secured a needle L, and on the other end is secured a diamagnetic frame I, having therein a ratchet-tooth O, and having a counter-weight P extending from one side thereof. The upper edge of the slot M in the plate G is a trifle below the surface of pole-piece F, so that the armature K in rising cannot come in contact with said pole-piece and stick thereto.

The operation of my invention is as follows: The parts being in the position shown in Figs. 1 and 2, the detent H on the core B engages with the tooth O on frame I, and is held in engagement therewith by the weight of the oscillatory armature K and frame I. When an electro-current is passed through the bobbin E, the pole-pieces D F become magnetized and attract the armature K and bodily raise it until the tooth O is disengaged from the detent H, when the counterweight P causes the armature K to partially rotate and the needle L to indicate its proper number.

As shown in the drawings, the side of the frame I limits the rotation of the armature K by coming in contact with detent H; but this may be obtained in various ways. It is evident that in this construction I get the benefit of the attraction of both ends of the magnet directly upon the axially-oscillatory armature, and by making this armature carry the needle I attain the desired result with a feebler current of electricity than if the armature were a mere attachment to a shaft and acted on by only one pole of the magnet.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, in an annunciator, of an electro-magnet and an axially-oscillatory armature carrying a needle and extending beneath and bodily raised by the two poles of the electro-magnet, substantially as described.

2. In an annunciator, the combination, with an electro-magnet having a core B, carrying the pole-pieces D and F, and having the detent H formed on its end, of the armature-shaft K, extending beneath both the pole-pieces, bodily lifted thereby, and carrying on one end the needle L and on the other end the counterweighted frame I, having thereon a ratchet-tooth, substantially as shown and described.

3. The combination, in an annunciator, of

a face-plate, an electro-magnet comprising a detent, a diamagnetic plate extending below the magnet and having a slot, and an axially-oscillatory armature journaled in the face-plate and diamagnetic plate, carrying a needle at one end and a toothed frame at the other end, and extending beneath and bodily raised by the two poles of the magnet, substantially as described.

FRANK E. FISHER.

Witnesses:
CYRUS E. LOTHROP,
ADELAIDE A. ANDERSON.