(No Model.) 2 Sheets—Sheet 1.

J. O. ZIEGLER.

SIGNAL INDICATING APPARATUS.

No. 454,245. Patented June 16, 1891.

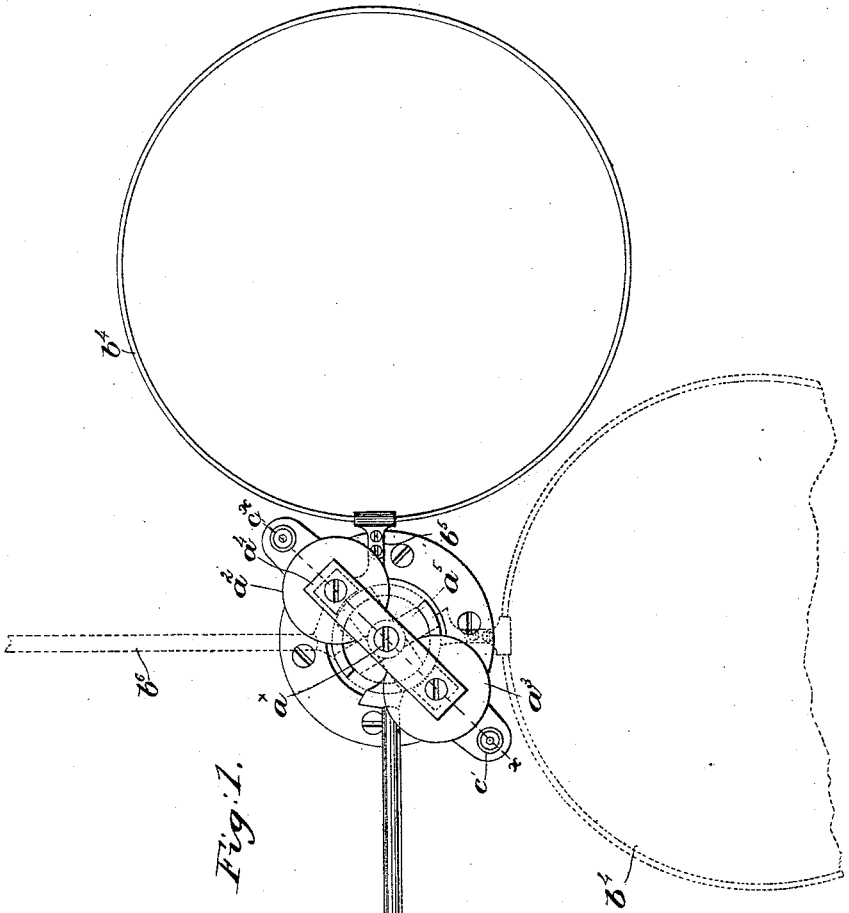


Fig. 1.

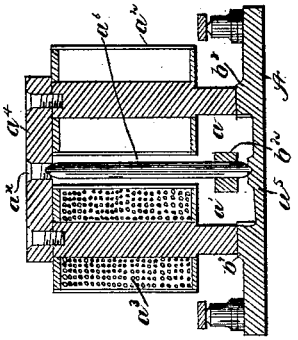


Fig. 1a.

Witnesses.
Fred'k S. Greenleaf
Edward F. Allen

Inventor.
Jacob Oscar Ziegler
by Crosby & Gregory Attys.

(No Model.) 2 Sheets—Sheet 2.

J. O. ZIEGLER.

SIGNAL INDICATING APPARATUS.

No. 454,245. Patented June 16, 1891.

Fig. 2.

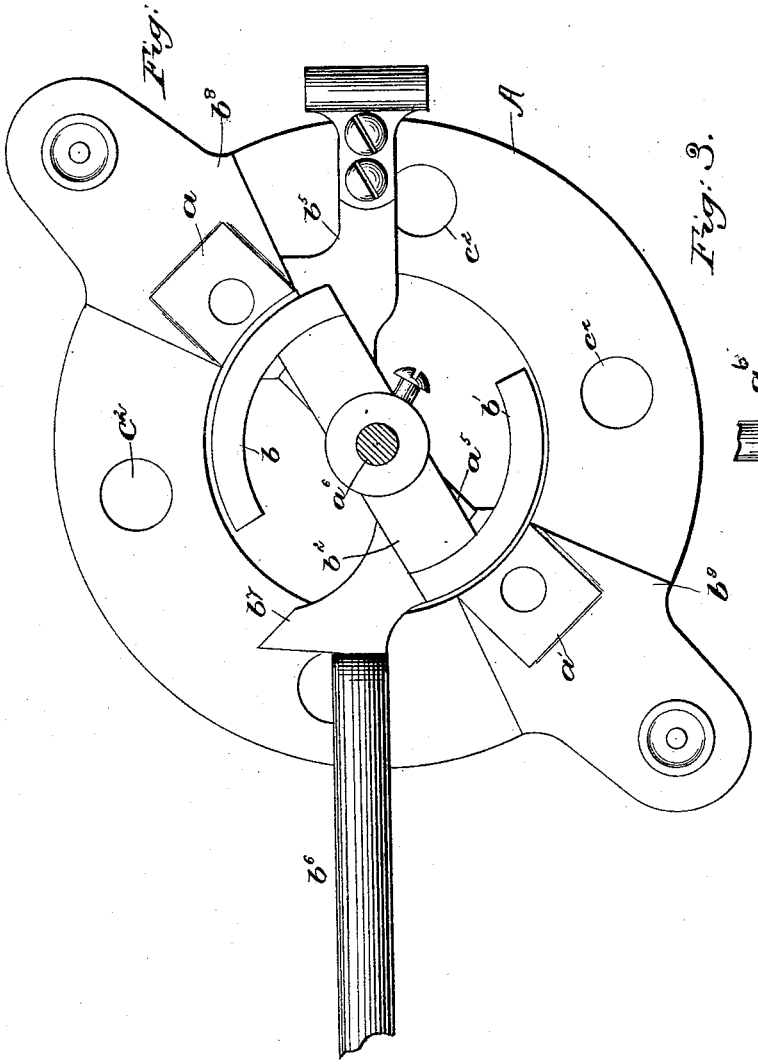
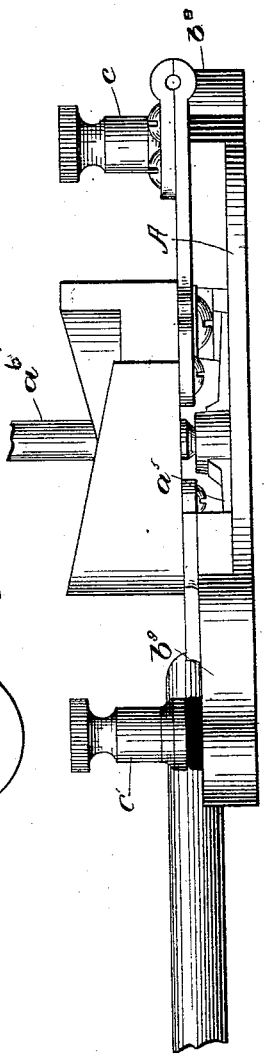


Fig. 3.



Witnesses.
Fred'k S. Greenleaf
Edward F. Allen

Inventor.
Jacob Oscar Ziegler
by Crosby & Gregory Attys.

UNITED STATES PATENT OFFICE.

JACOB OSCAR ZIEGLER, OF BOSTON, MASSACHUSETTS.

SIGNAL INDICATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 454,245, dated June 16, 1891.

Application filed November 28, 1890. Serial No. 372,805. (No model.)

To all whom it may concern:

Be it known that I, JACOB OSCAR ZIEGLER, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Signal Indicating Apparatus, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to a novel construction of signal indicating apparatus, and is an improvement upon the apparatus substantially such as shown and described in United States Patent No. 436,371, dated September 16, 1890.

My present invention has for its object to improve the construction of the apparatus referred to, whereby a substantially large signal or indicating device may be operated by a minimum amount of battery-power.

My invention therefore consists in the combination, with a non-magnetic base consisting of a ring provided with a cross-bar, of an electro-magnet having the pole-pieces secured to the said base, and an armature pivoted to the cross-bar between said pole-pieces and having the extended arm, a signal-indicating device attached to one end of the armature, and a counter-balance secured to the other end of the armature, substantially as will be described.

Figure 1 is a front elevation of my improved apparatus, showing the signal or indicating device in its inoperative and operative positions; Fig. 1ª, a section on the line $x\,x$, Fig. 1; Fig. 2, a section of the apparatus shown in Fig. 1, on an enlarged scale, below or behind the magnets and Fig. 3, a side elevation of the apparatus shown in Fig. 2.

The base A, supporting the working parts, is made, as herein shown, as a non-magnetic ring, preferably of brass, to which are secured by suitable bolts (not shown) the pole-pieces $a\,a'$ of electro-magnets $a^2\,a^3$, joined by a back strap a^4. The base A has secured to or forming part of it a cross-bar a^5, in which is journaled one end of a rod or shaft a^6, having its other end journaled in a non-magnetic bearing, preferably a brass screw $a^\times$, inserted through the back strap a^4. The pole-pieces $a\,a'$ are made of substantially uniform thickness from the point where they project beyond the coils of the electro-magnets and the point where they are fastened to the ring A The pole-pieces $a\,a'$ on their inner faces are preferably slightly curved to act on the curved extensions or arms $b\,b'$ of an armature b^2, fast on the rod or shaft a^6. The armature b^2 has secured to it at one end a signal indicating device, herein shown as a semaphore b^4, which is fastened to a lug or projection b^5, attached to the armature, and the latter is provided at its other end with a counterbalancing-weight, shown as a rod b^6, secured to a projection b^7, attached to the armature.

The base A is provided, as shown, with raised portions $b^8\,b^9$, substantially diametrically opposite, and to which the pole-pieces $a\,a'$ are secured, and the said raised portions have fastened to them binding-screws $c\,c'$. The projections $b^5\,b^7$ on the armature in the revolution of the armature strike against the raised portions and stop the movement of the said armature.

The base A may be secured in operative position by means of screws, (not shown,) which are inserted through the holes c^2 in said base.

The arms $b\,b'$ of the armature are made of sufficient length to have their ends remain in close proximity to the pole-pieces when the indicating device is down or in its operative position, (shown by dotted lines, Fig. 1,) which occurs when the circuit of the electro-magnets is broken.

The apparatus is designed to be used in a closed circuit, and the indicating device is normally in the position shown by full lines, Fig. 1; but when the circuit is broken—as, for instance, in railway-signaling by the passage of a train—the weight of the semaphore turns the armature and its shaft, and the said semaphore drops into its dotted-line position, and as soon as the circuit is again closed the armature is attracted by its magnets and the semaphore lifted into its full-line position.

The instrument above described is capable of being worked with a minimum amount of battery power to lift a signal or semaphore of substantially large size.

I claim—

1. The combination, with a non-magnetic base A, consisting of a ring provided with a cross-bar a^5, of an electro-magnet having the

pole-pieces $a\,a'$, of substantially uniform thickness and curved on their inner faces, secured to the said base at the extremities of the cross-bar, and an armature pivoted to said cross-bar between the pole-pieces and having curved extended arms $b\,b'$, movable between the electro-magnet and the base, adjacent to the inner faces of the pole-pieces, a signal indicating device attached to one end of the armature, and a counter-balance secured to the other end of the armature, substantially as described.

2. The combination, with a non-magnetic base consisting of a ring having the raised portions $b^8\,b^9$ and a cross-bar a^5, of an electro-magnet having its coils connected by a back strap and provided with pole-pieces $a\,a'$, of substantially uniform thickness and curved on their inner faces and secured to the raised portions of the base, an armature fast on a shaft, having bearings in the cross-bar and back strap, and having projections $b^5\,b^7$ at its opposite ends, curved extended arms on said armature movable between the pole-pieces, an indicating device or signal secured to one end of the armature, and a counter-balance secured to the opposite end of the armature, the said projections in the revolution of the armature striking against the raised portions $b^5\,b^7$ of the base to limit the movement of the armature, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JACOB OSCAR ZIEGLER.

Witnesses:

JAS. H. CHURCHILL,

EMMA J. BENNETT.