

No. 787,936.

PATENTED APR. 25, 1905.

C. H. NORTH.
SELECTIVE SIGNALING DEVICE.

APPLICATION FILED JUNE 19, 1903.

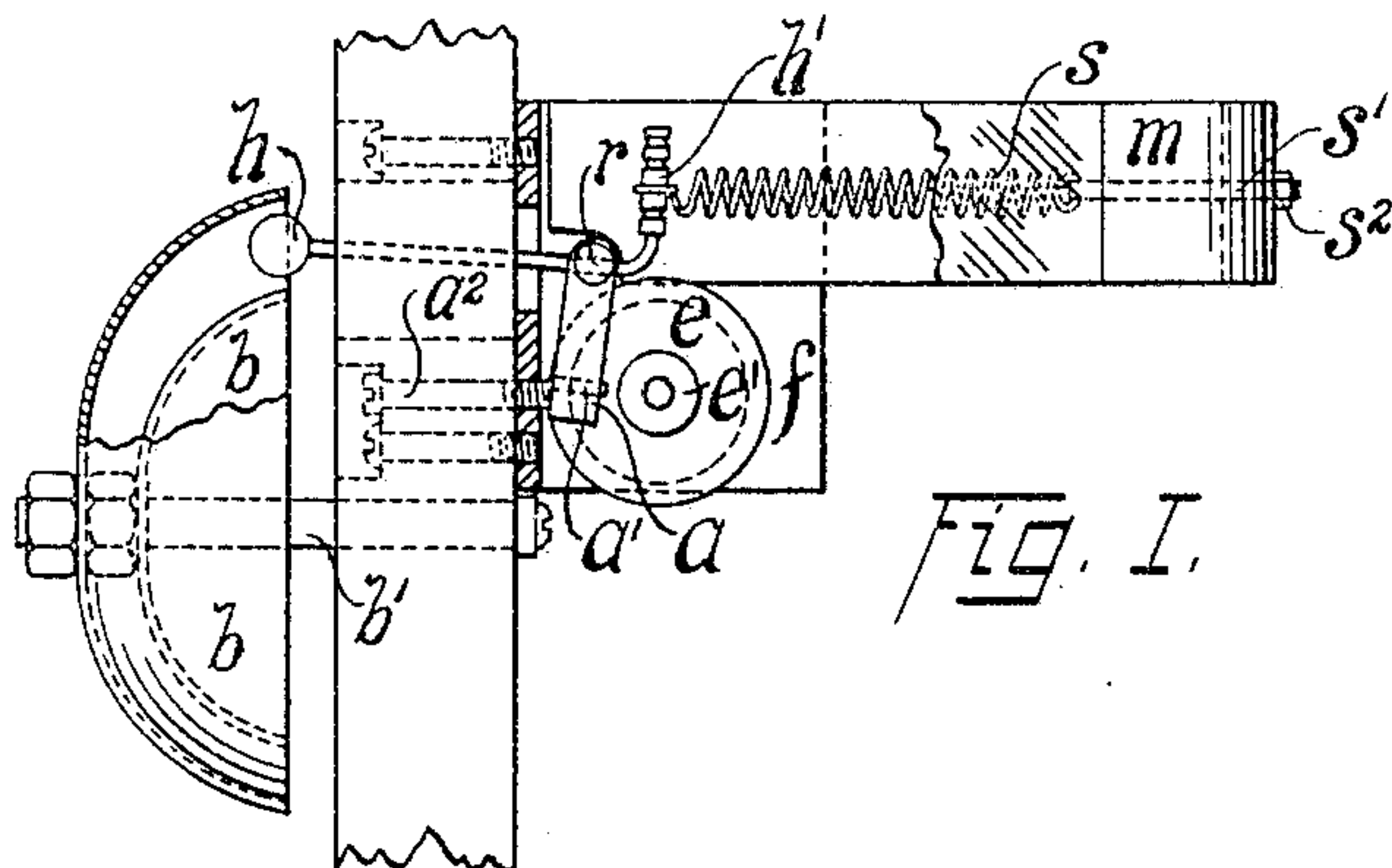


Fig. I.

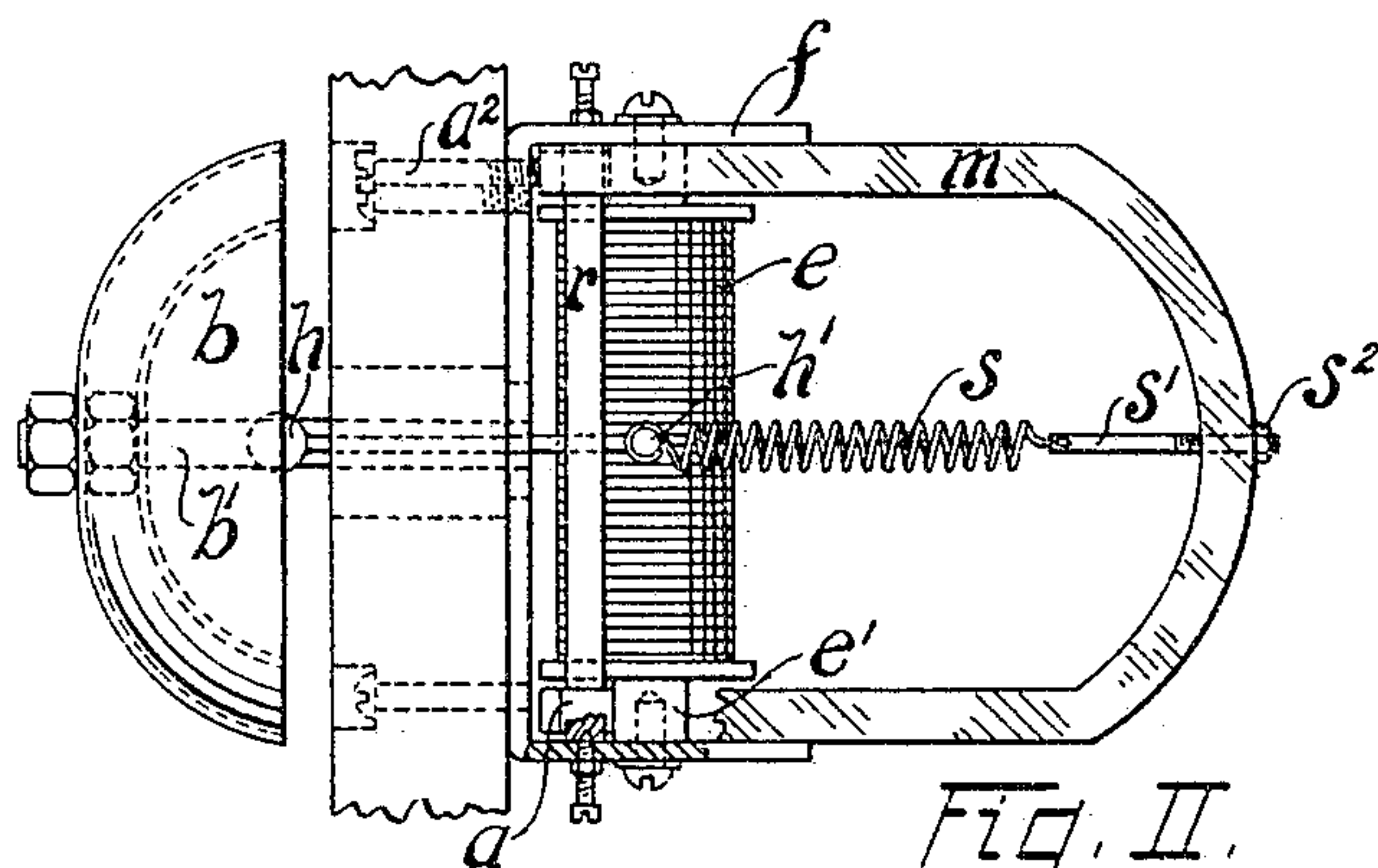


Fig. II.

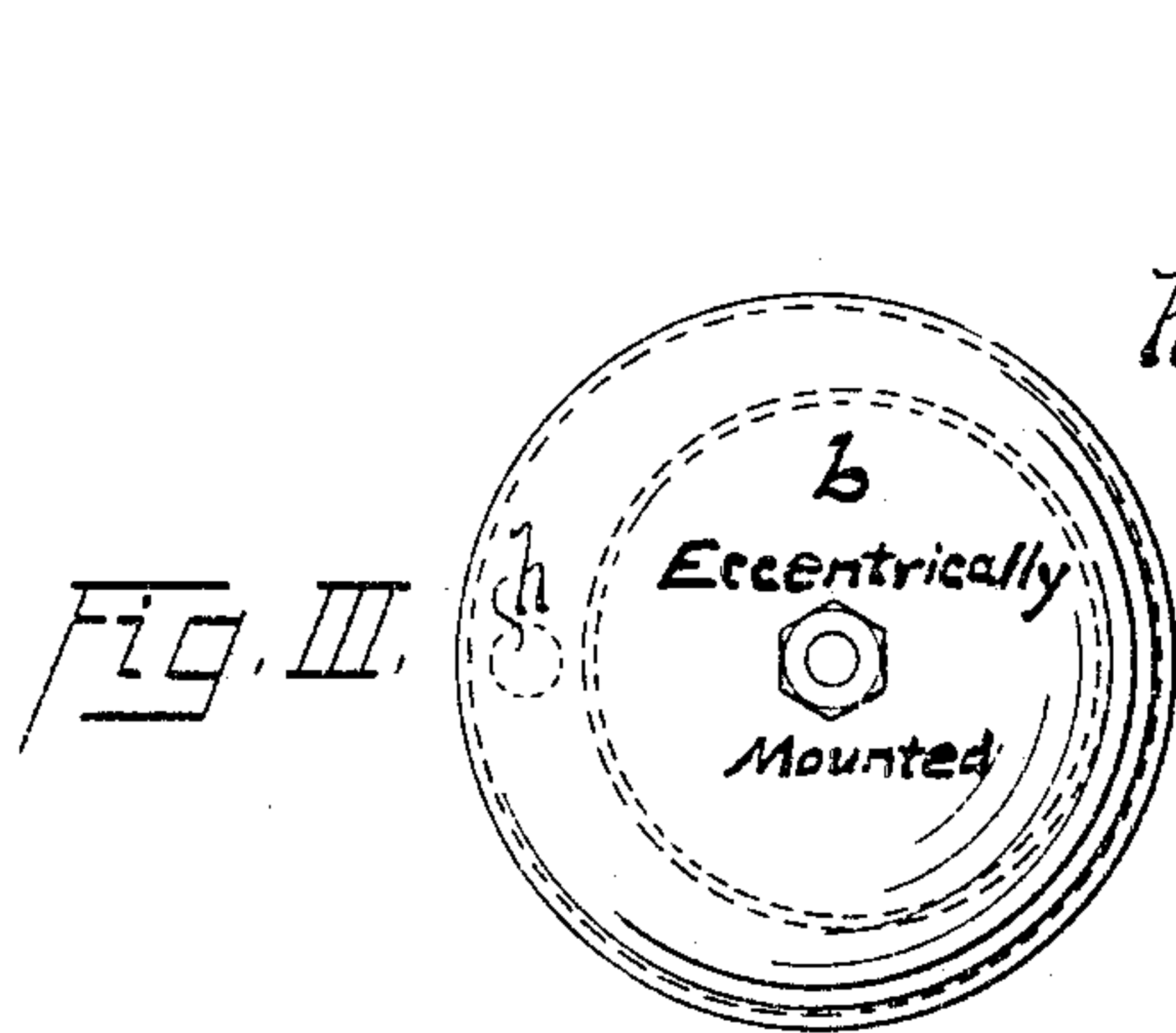


Fig. III.

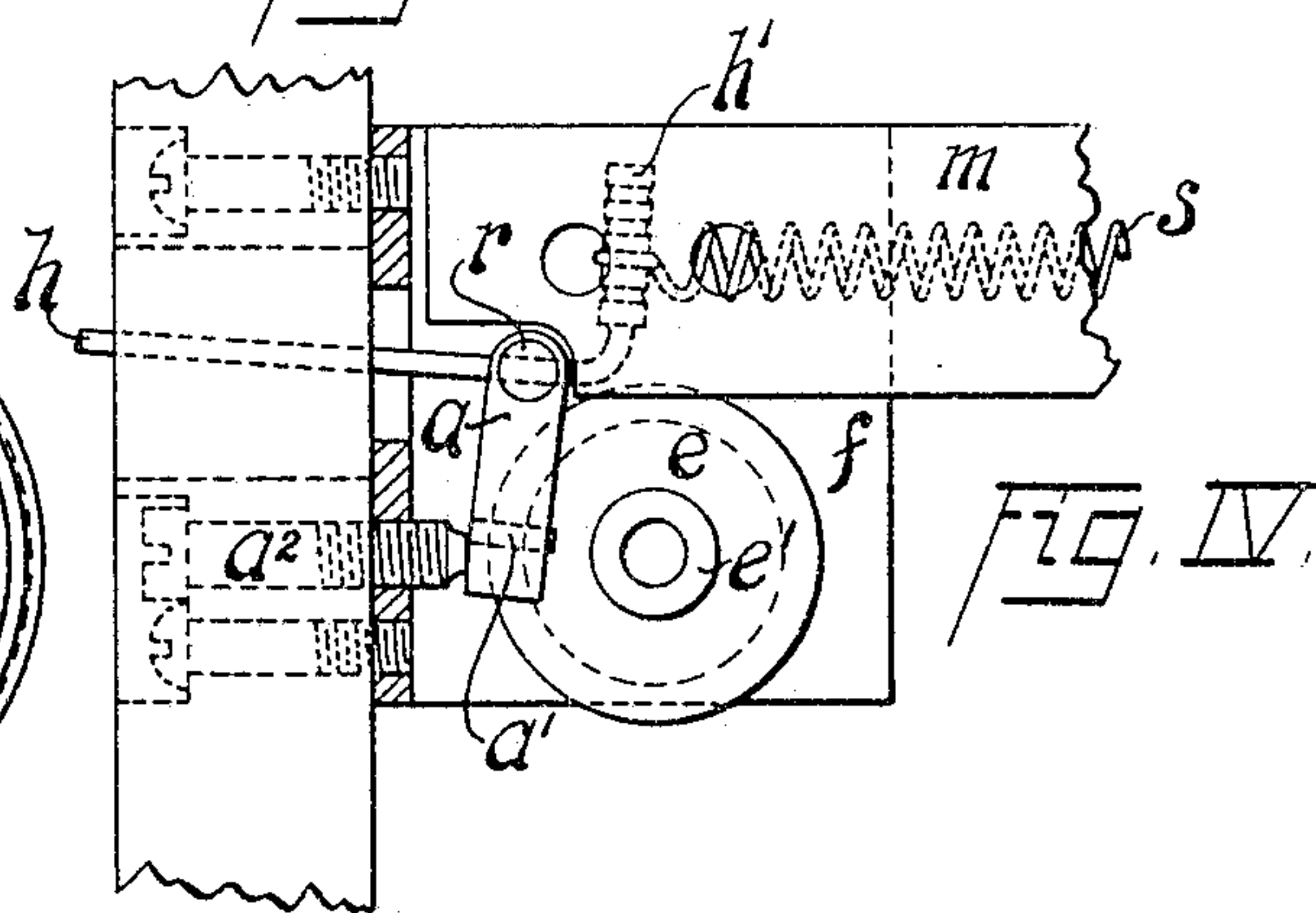


Fig. IV.

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UNITED STATES PATENT OFFICE.

CHARLES H. NORTH, OF CLEVELAND, OHIO, ASSIGNOR TO THE NORTH ELECTRIC COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

SELECTIVE SIGNALING DEVICE.

SPECIFICATION forming part of Letters Patent No. 787,936, dated April 25, 1905.

Application filed June 19, 1903. Serial No. 162,236.

To all whom it may concern:

Be it known that I, CHARLES H. NORTH, a citizen of the United States of America, and a resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Selective Signaling Devices, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to improvements in selective signaling devices, and, as herein set forth, is embodied in apparatus more particularly designed for use as a selectively-actuated bell for telephone-stations. This appliance I shall herein specifically describe and refer to its use for the purpose of making clear my said invention.

The object I have had in mind in perfecting this device has been the provision of a simple, efficient, and serviceable signaling-bell adapted to respond only to predetermined currents of electricity whereby telephone party-lines may be equipped with bells practically inert to all but the signaling-currents individually required by each bell for its actuation. As commonly constructed hitherto this class or type of signaling-bell has not been absolutely non-responsive to the non-selective currents, and built upon the lines of an ordinary polarized bell a difficulty has been encountered in that the serviceability of such bells is quite unnecessarily decreased by their normal use in selective signaling. It has been the general experience in practice that biased signaling-bells operated in pairs by currents of opposite polarity will give at least a single false signal or will "chatter" under the influence of the non-selective current, so that a subscriber will be apprised of the call of another party and may occasionally mistake the false signal for his own, and thus answer the call of another party. Following, as they do, a type of apparatus not fully adapted for selective signaling, such bells also are found to be of decreasing efficiency as they continue in use, and this for the reason that the energizing-current gradually weakens the permanent magnet of the bell, which it must oppose and reverse in polarity at each stroke of the bell.

I have accordingly sought to overcome or eliminate these inherent deficiencies and at the same time have provided improvements in certain other respects, as will appear from the succeeding portions of the specification and claims.

Preliminary to a fuller description of the telephone signaling-bell herein shown I may say that it comprises a U-shaped permanent magnet, beyond the poles of which is mounted the single-cored electromagnet provided for actuating the bell. Pivoted armature parts at either end of the electromagnet lie also within the field of the permanent magnet, said parts serving when attracted to effect the desired signal. A spring or its equivalent is associated with these armature parts to give the device the desired bias.

Reference to the accompanying drawings will render the details of construction more readily understood, wherein—

Figure 1 is a side elevation or view of the device or signaling-bell embodying my invention, the parts thereof being partially broken away better to illustrate the construction. Fig. 2 is a plan view thereof, likewise partially broken away. Fig. 3 is a detail showing the manner of mounting the bells, and Fig. 4 is an enlarged detail of the operating parts of the device.

The same character of reference is employed throughout the several figures of the drawings to indicate similar parts.

A rectangular frame *f*, of brass, serves to mount the several operative parts of the device. The U-shaped magnet *m* is screwed to the frame, its extremities being laterally recessed or cut away partially to accommodate the armature parts *a*, mounted near the ends of the rock-shaft *r*, likewise preferably formed of brass, which rock-shaft is pivoted within said frame. The clapper or hammer *h* for the bells is mounted centrally upon said rock-shaft, the rearward extremity *h'* thereof being bent upward, and a spring *s* is inserted between the threaded support *s'* at the arch of magnet *m* and said extremity *h'*. The tension of the spring is adjustable merely by altering the point of the spring's attachment

along the length of part h' , which is scored for that purpose, and also by means of the nut s^2 upon the threaded support. The desired bias is imparted to the device through
 5 the medium of this spring or by simply counterweighting the clapper-rod, if preferred.

Adjacent to the extremities of magnet m , but separated therefrom at both ends by a decided air-gap, is provided the electromagnet e , adapted to be connected in the signaling-circuit or in bridge of the telephone-line. This comprises a straight core e' , with the usual helix or windings of insulated wire, said core being screwed within the frame at one
 15 side of the poles of magnet m and in position to rock the armature, the rock-shaft, and the bell-hammer upon their common pivotal mounting whenever the windings of the electromagnet are suitably excited. Thus
 20 whenever excited by positive pulsating current, we will say, these parts will be rapidly vibrated by the alternate action of the electromagnet e and the spring s , serving to sound the desired signal in the well-known manner.

25 The bells b are substantially concentrically mounted the one within the other upon a common post or support b' , the clapper h playing between their adjacent rims. These bells or gongs, however, are each bored slightly
 30 out of center, so that they may be independently rotated to adjust them at the proper striking distance from the hammer, in which position they are then secured upon their supporting part by binding-nuts.

35 The armature parts a are provided with small brass studs a' , slightly projecting from their inner faces to engage the excited core e' of the electromagnet and prevent sticking. An adjusting-screw a^2 limits the play or move-
 40 ment of the several parts carried by the rock-shaft, the said screw engaging the opposite face of the armature part a .

As thus constructed, it will be seen that despite the several air-gaps present therein the
 45 path of least resistance for the magnetic circuit between the poles of magnet m lies through the armature parts a and the soft-iron core e' of the electromagnet, and in consequence these parts normally are polarized
 50 or magnetically excited. The armature parts a are pivotally mounted quite close to the recessed pole-pieces of the magnet m and are very strongly magnetized thereby. When pulsating current of positive polarity, as we have
 55 assumed, is sent over the helix or magnet-winding of the electromagnet, the core e' becomes intermittently excited and exhibits an

opposing polarity, which causes the bell-clapper to vibrate rapidly and sound the bells through the alternate action of said electro- 60 magnet and the spring s . This, it is to be observed, is accomplished, however, without reversing the polarity of the permanent magnet m , since the normal air-gaps and the existing polarity of said magnet are sufficient to throw 65 the lines of electromagnetic force into the surrounding air, thus preserving magnet m against the observed weakening effect of frequent reversals of polarity. The structure furthermore possesses the distinct advantage 70 of not responding even to the extent of the common single stroke or false signal to the flow of non-selective or in the assumed instance negative pulsating-current, its magnetic reluctance, or its "inertia," as I may 75 term it, being such that the device remains inert when excited by the opposing current.

Having now described apparatus embodying my invention, I claim as new, and desire to secure by Letters Patent, the following: 80

1. The combination with two oppositely-disposed and oppositely and permanently magnetized pole-pieces, of a single-core electro- magnet without the normal field between said permanently-magnetized pole-pieces and with 85 its bare pole-pieces respectively adjacent to the permanently-magnetized pole-pieces, movable armature parts operated upon mutually by the permanently-magnetized pole-pieces and by the pole-pieces of the electro- 90 magnet, and mechanism actuated by said armature parts, substantially as set forth.

2. The combination with two oppositely-disposed and oppositely and permanently magnetized pole-pieces, of a single-core electro- 95 magnet disposed without the normal field between said permanently-magnetized pole-pieces and with its bare pole-pieces respectively adjacent to the permanently-magnetized pole-pieces, pivoted armature parts op- 100 erated upon mutually by the permanently-magnetized pole-pieces and by the pole-pieces of the electromagnet when the latter is excited, a signaling device, and means associated with the armature parts for actuating said 105 signaling device, substantially as set forth.

Signed at Cleveland, this 15th day of June, 1903, in the presence of two subscribing witnesses.

CHARLES H. NORTH.

Witnesses:

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