H. J. ARCHER.

TELEGRAPHIC RELAY.

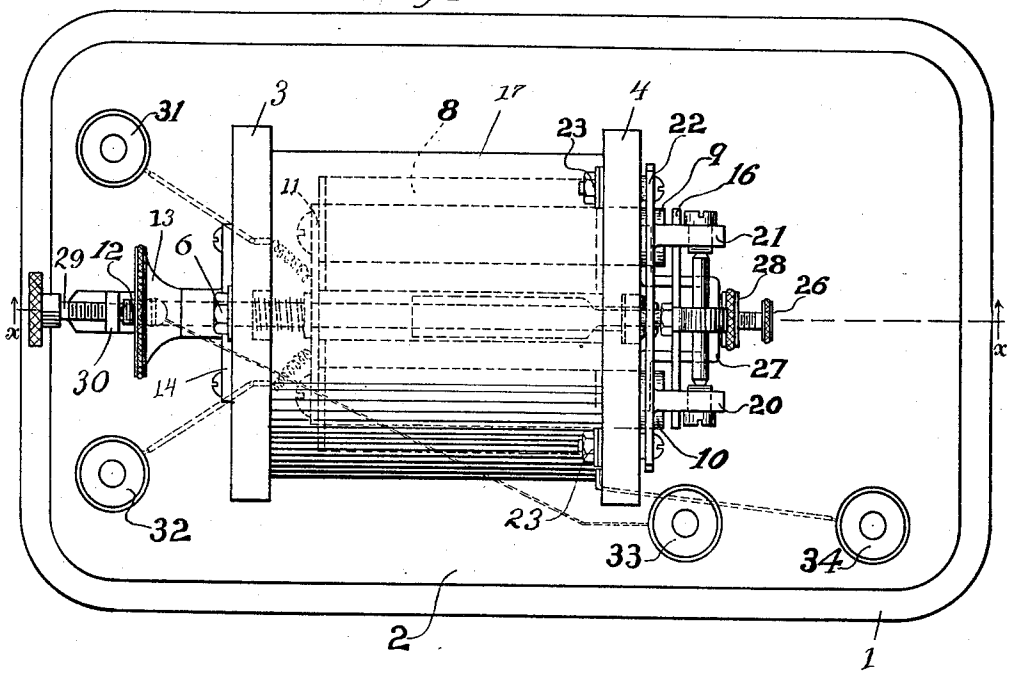
APPLICATION FILED FEB. 8, 1912.

1,041,718.

Patented Oct. 22, 1912.

2 SHEETS—SHEET 1.

Fig. 1



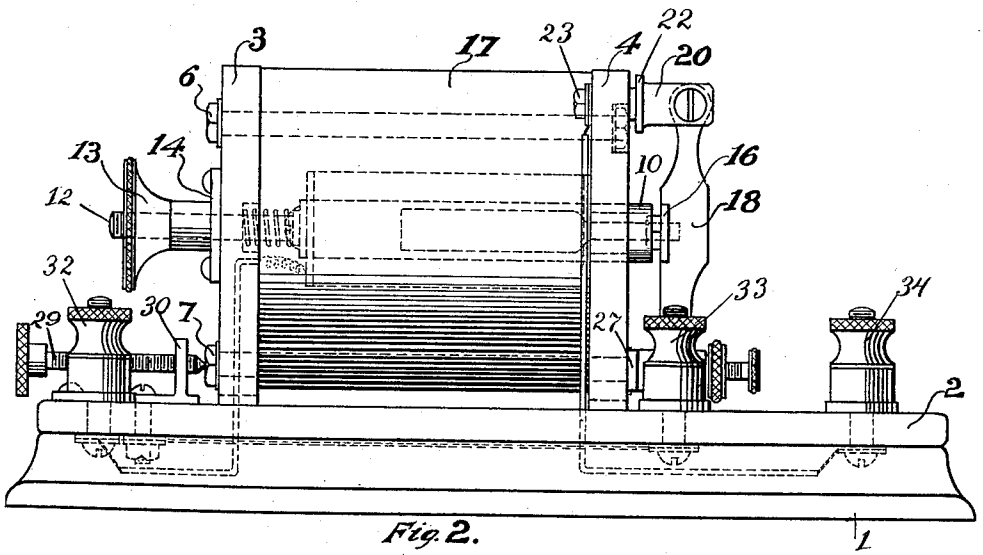


Fig. 2.

Witnesses.
N. Brandt.
J. E. Titus

Inventor:
Hugh J. Archer.
By Joshua R. H. Potts
his Attorney.

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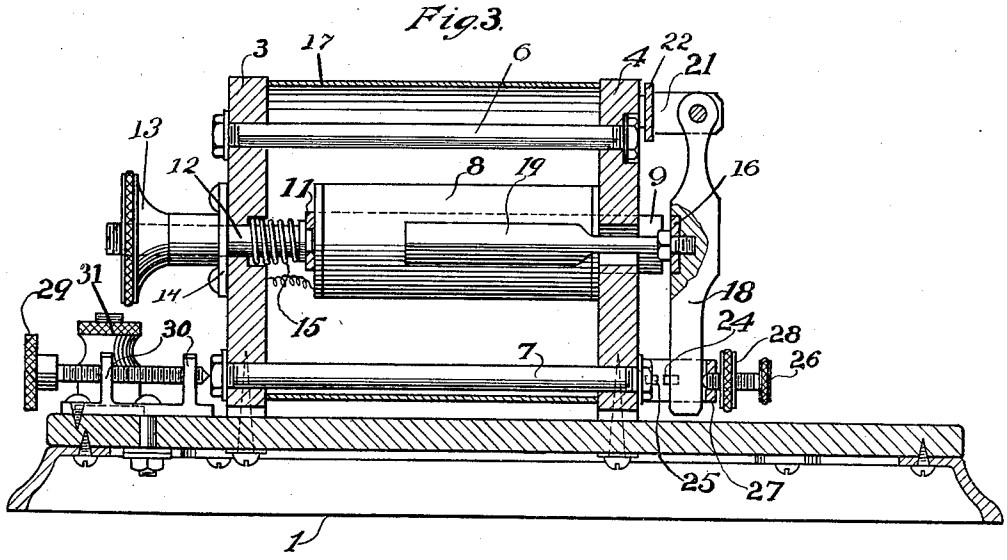
2 SHEETS—SHEET 2.

Fig. 3.



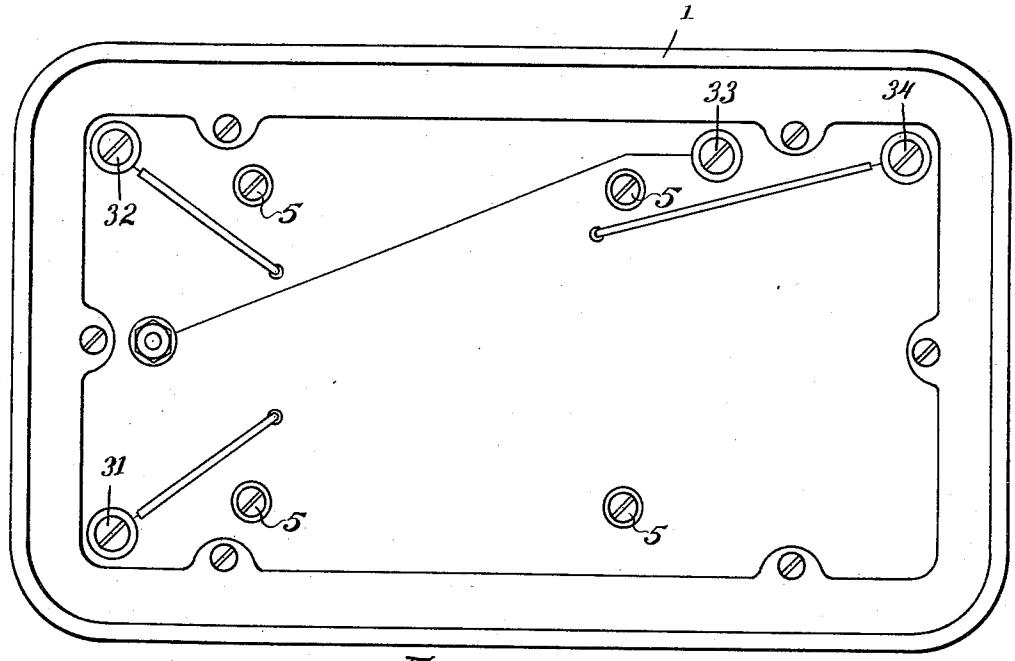


Fig. 4.

Witnesses.

M. Brandt.

J. E. Titus

Inventor

Hugh J. Archer

By Joshua R. H. Potts

his Attorney.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HUGH J. ARCHER, OF CHICAGO, ILLINOIS.

TELEGRAPHIC RELAY.

1,041,718. Specification of Letters Patent. Patented Oct. 22, 1912.

Application filed February 8, 1912. Serial No. 676,261.

To all whom it may concern:

Be it known that I, HUGH J. ARCHER, a citizen of the United States, and a resident of the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Telegraphic Relays, of which the following is a specification.

In the present system of telegraphy, a line circuit runs from station to station and at each station, inserted in the circuit is a relay. The armature of this relay operates a circuit which contains a local sounder. The signal is read from the local sounder. This is done because the line circuit is necessarily weak and the relay must be very sensitive to respond to the signal. As a result the armature is made light and thin to cut down its inertia and the clicks of the armature against its two stops are practically unreadable. The light armature gives off a faint sound and the two clicks are indistinguishable. Also, the make contact must sound louder than the back contact because the interval between the make and the back click determines the dots and dashes. But, the sounder is a more rugged instrument, able to carry a stronger current in its coil, and capable of operating a heavy armature.

In my invention, I propose to improve the mechanical construction and arrangement of the various parts of the relay so that its signal may be read directly and also to provide an instrument that is not so susceptible to get out of adjustment as is the case with the usual relay.

Other objects and advantages will appear hereinafter.

My invention consists in the combinations and arrangements of parts hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings forming a part of this specification, and in which,

Figure 1 is a top plan view of a relay embodying my invention, Fig. 2 is a side elevation of the same, Fig. 3 is a sectional elevation, the section being taken on the line *x*—*x* of Fig. 1, and Fig. 4 is a bottom plan view.

In these drawings is shown the preferred form of construction of my invention, and in which the pedestal 1 is made of metal and supports the base proper 2 so that there is a sounding chamber underneath this base. The base 2 is made of insulating material; in this case it is made of wood. Upon the base 2 are carried upright frame members 3 and 4. These are fastened to the base by the screws 5. The rods 6 and 7 run between the frame members 3 and 4 and are centrally located. Between these frames is mounted a pair of electromagnetic coils 8 which are of the usual type having cylindrical core pieces 9 and 10 which are connected together at their rearward end by the pole piece 11. Extending from the member 11 is a threaded stem 12 which passes through the frame member 3 and carries at its outer end an adjusting nut 13 which bears upon the metallic plate 14. A spring 15 holds the coils 8 in their forward position and keeps the adjusting nut 13 against the metallic plate 14. The outer ends of the cores 9 and 10 extend through the frame member 4 and are in adjustable relation to the armature 16. By turning the adjusting nut 13 the distance between the armature 16 and the ends of the core pieces 9 and 10 can be altered.

Between the frame members 3 and 4 is frictionally held the fiber cylinder 17 which extends around the coils 8 and the rods 6 and 7 and completely incloses the same. The nuts on the rods 6 and 7 can be tightened up so that the frame pieces 3 and 4 bear firmly against the cylinder 17 thus making a very strong and rigid structure.

The armature 16 is secured to the lever 18 by a radially extending weight arm 19, threaded into the lever 18. The lever 18 is pivoted at its upper end between two bearing studs 20 and 21 which extend from the plate 22 which is secured at the upper edge of the member 4 by screws 23 which extend through the member 4 and form binding posts for the local circuit. The armature 18 carries a platinum contact point 24 at its lower end which makes a contact with a similar platinum point 25 which is carried in the end of the rod 7 as shown in Fig. 3. The back stop for the armature 18 is formed by a threaded screw 26 which is screwed through a yoke member 27 and held in adjustment by the lock nut 28. Yoke member 27 is screwed to the frame member 4. At the opposite end of the rod 7 is mounted a screw 29 which is threaded through the studs 30 which are screwed to the base 2 as shown in Fig. 3. Upon the base 2 are mounted four binding posts 31 and 32 for the line connections and 33 and 34 for the

local circuit. The binding posts 31 and 32 are connected to the bindings of the electromagnetic coils 8. The post 34 is connected up to the screws 23 and through said screws to the armature, through the studs 20 and 21 and the bearings. The binding post 33 is connected to the threaded screw 29, thus the local circuit is adapted to be made and broken at the contacts 24 and 25 when the threaded screw 29 is in engagement with the end of rod 7. When it is desired to cut out the local circuit, the screw 29 is turned until it is out of engagement with the rod 7. With this construction of the armature the reactions of the armature are always the same. The coils 8 are moved toward or away from the armature 16 to get the proper adjustment and, for the same strength of current, this adjustment will be permanent. This manner of pulling the armature away from the core pieces has been demonstrated to work very satisfactory in actual service.

The coil mountings and the armature mountings are all contained in one structure which is screwed to the base by the screws 5 and also the awkward pedestal for the old style spring adjustment is eliminated.

The sounding chamber formed by the cylinder 17 and the frame members 3 and 4 increases the sound of the armature lever 18 striking its stops. Also it accentuates the make contacts and the two sounds are easily distinguishable in the rapid clicking of the signaling. Also, this keeps the signal from being "up-side-down," that is with the wrong contact sounding the louder. This is the principal trouble in reading the ordinary relay, that is, in properly distinguishing the clicks. When it is desired to cut out the local circuit in the old style relay a pencil or pen holder is stuck between the armature and the coils. This invariably causes disarrangements in the adjustment of the relay and throws it out of operation. In my invention is provided a contact which is thrown out by simply turning the threaded screw 29 away from the end of the rod 7. This makes a very quick and simple method of cutting out the local sounder.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a relay, the combination with an armature lever pivoted at its upper end, of an armature member and a perpendicularly extending weight arm having an end shouldered down and threaded, the said armature being secured to the said lever by having the said weight arm passed through said armature and secured into said lever, substantially as described.

2. In a relay, the combination with a base; of a plurality of end frame pieces mounted thereon; a cylinder interposed between said end frame pieces; rods connecting said end frame pieces, one of said rods constituting a contact member; an electromagnet within said cylinder; an armature adapted to coöperate with said magnet; a contact point carried by said armature for engagement with the contact rod aforesaid; and means for creating a circuit through said contact rod.

3. The combination with a base; of a cylindrical sound box mounted thereon; an electromagnet adjustably mounted in said sound box, the cores thereof adapted to project from the casing aforesaid; a lever pivoted to one end of said sound box; an armature carried medially and transversely by said lever for coöperation with the cores aforesaid; and a weight centrally carried by said armature and threaded into said lever for swinging said armature outwardly from contact with the cores aforesaid, said weight projecting into said sound box.

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

HUGH J. ARCHER.

Witnesses:
JOSHUA R. H. POTTS,
ARTHUR A. OLSON.