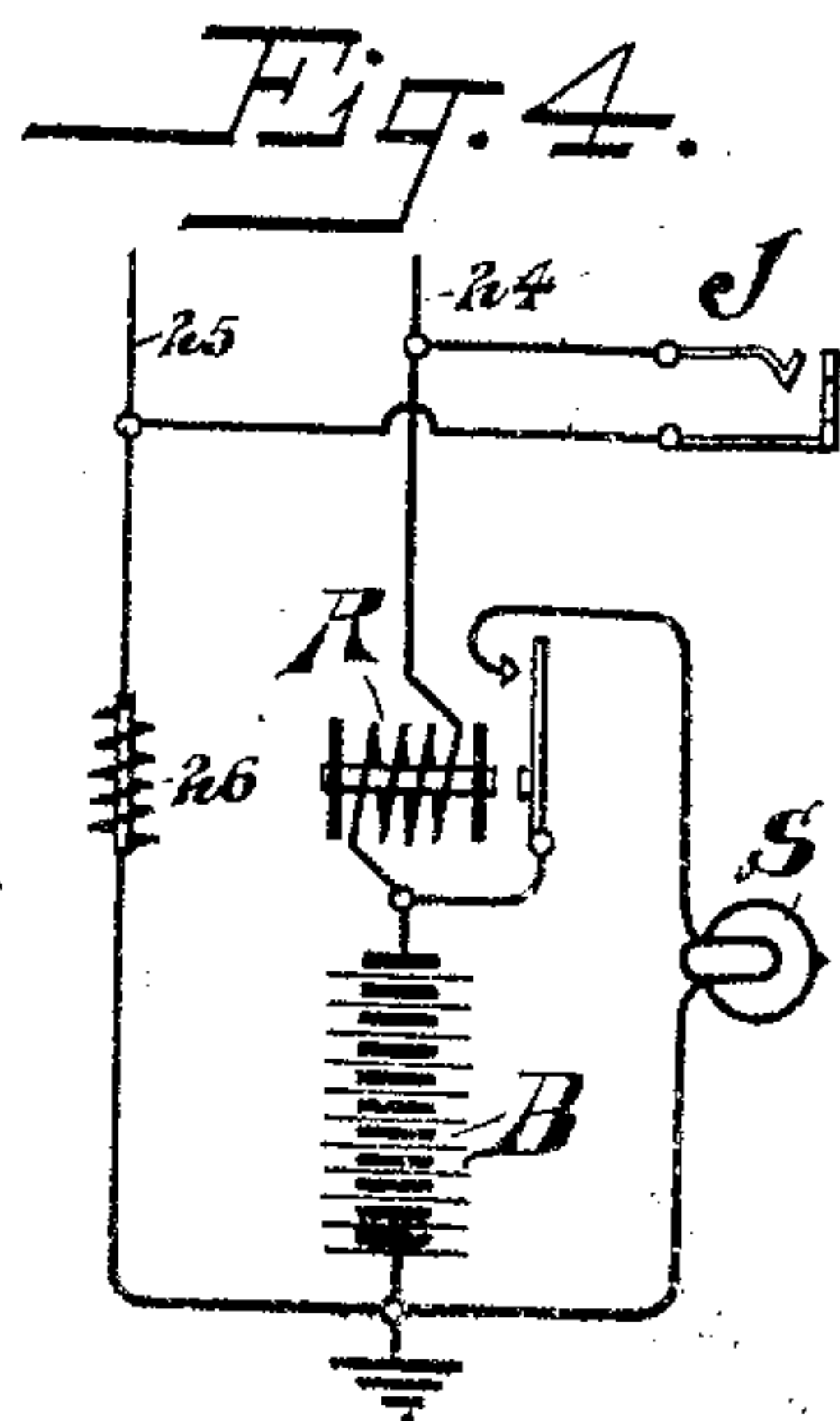
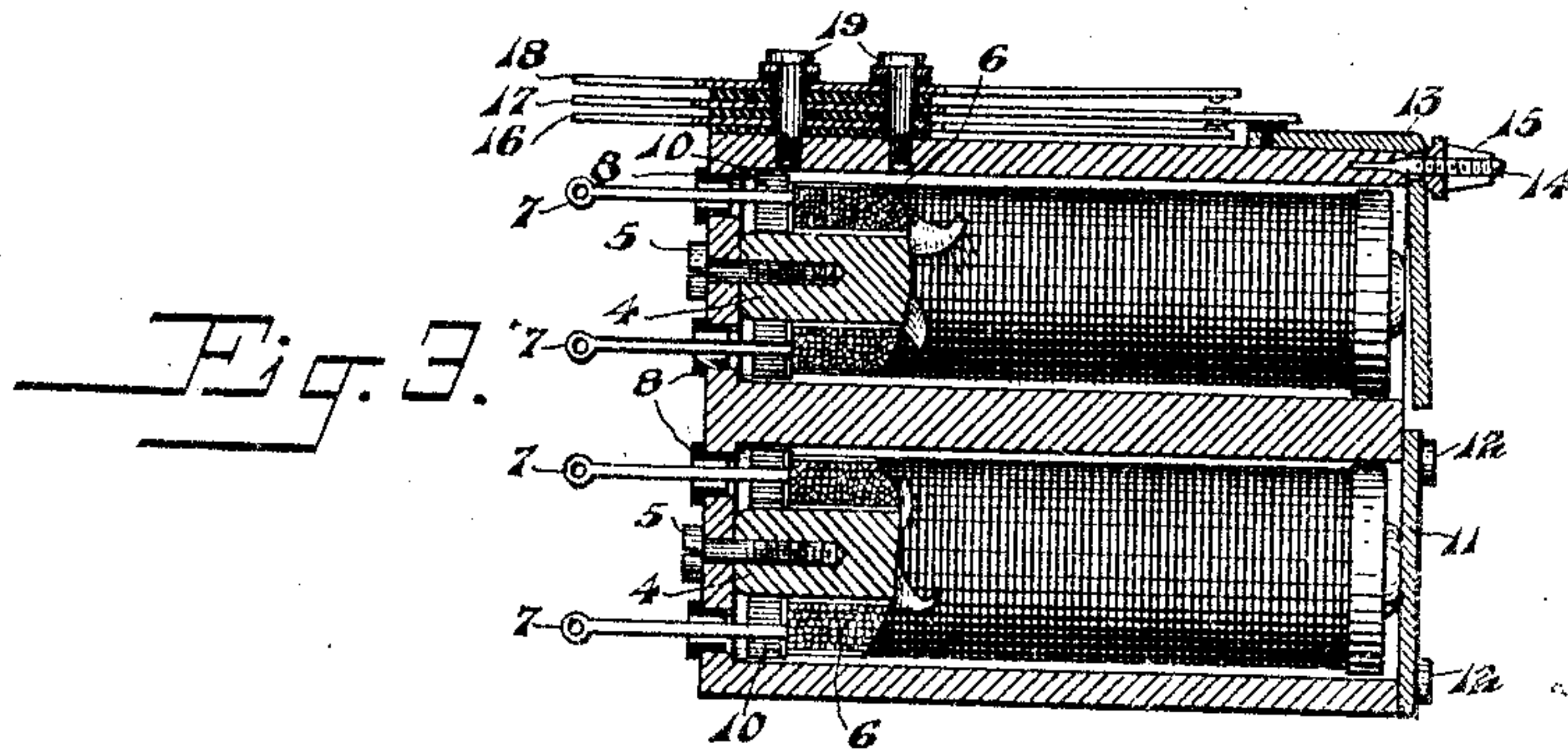
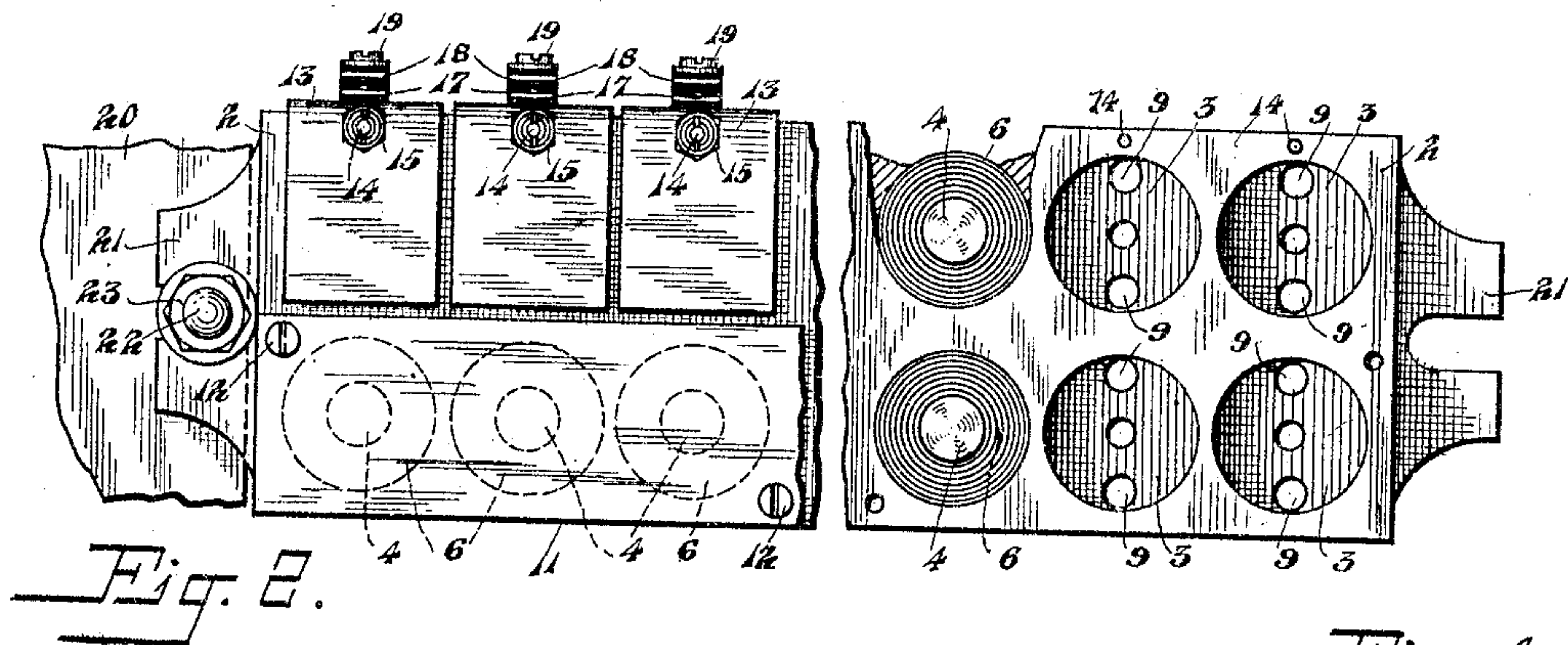
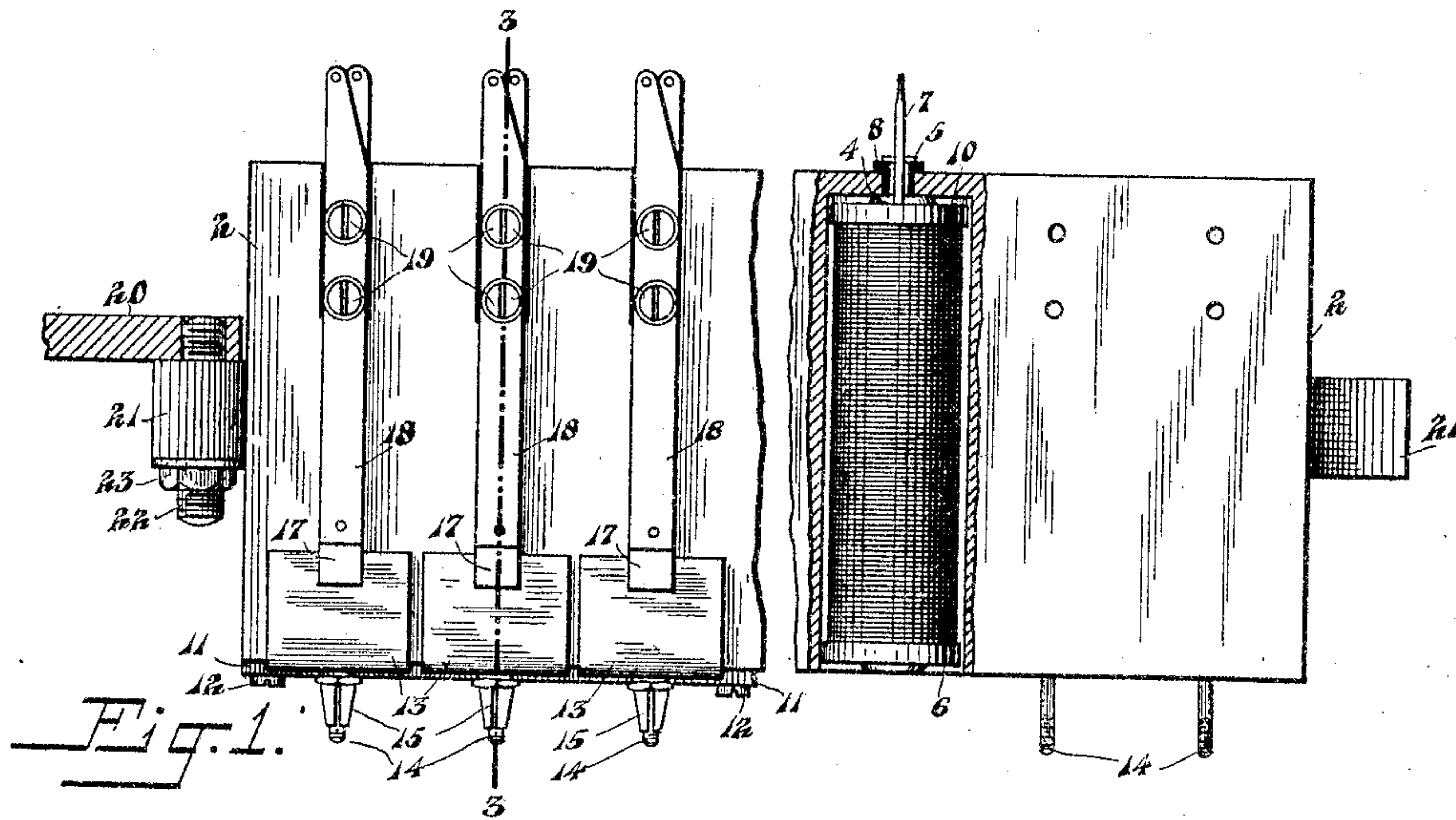


W. W. DEAN.
ELECTROMAGNETIC DEVICE.
APPLICATION FILED JUNE 19, 1903.



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ELECTROMAGNETIC DEVICE.

No. 832,181.

Specification of Letters Patent.

Patented Oct. 2, 1906.

Application filed June 19, 1903. Serial No. 162,200.

To all whom it may concern:

Be it known that I, WILLIAM W. DEAN, a citizen of the United States of America, and a resident of Chicago, county of Cook, and State of Illinois, have invented a new and useful Improvement in Electromagnetic Devices, of which the following is a specification.

My invention relates to improvements in electromagnetic devices, and more particularly to such devices as are adapted to be mounted in blanks or rows when installed for use. In telephone-exchanges, for example, the relays, impedance-coils, and similar devices are so great in number that it is often convenient to locate them in a separate room from the switchboard and upon suitable racks, where they are mounted side by side in superposed rows in order to economize space. It has been common heretofore to mount these devices separately upon supporting-strips and to then secure the supporting-strips to the racks.

It is one object of my invention to dispense with this separate making of electromagnetic devices and to provide a single shell or casing for a plurality of magnet-coils. For this purpose I preferably provide a cast-iron bar having a plurality of holes therein and place in each said hole a magnet-coil upon a suitable core. When these coils are to be employed as impedance-coils, a plate may be placed over the openings, so that the coils will be completely incased in iron, and when the coils are to be used as relays or for doing other work suitable armatures may be provided for the said coils. In some circuit relations it is also desired to associate an impedance-coil and a relay or similar device with each circuit, and this I readily accomplish by providing the said bar with two rows of holes, one above the other, and devote one row of holes to the use of impedance-coils and the other row for the relays or similar devices. This is readily accomplished in the construction mentioned by merely placing a strip of iron over the one row of holes and by arranging armatures adjacent the magnet-coils in the other row of holes. By thus arranging the devices all trouble and inconvenience in separately making the parts and in assembling them is avoided, and an efficient, economical, and durable construction is obtained.

To the accomplishment of these objects and such others as may hereinafter appear the invention consists in the novel parts and combinations of parts, hereinafter described, and particularly pointed out in the appended claims, reference being had to the accompanying drawings, forming a part of this specification, in which the same reference characters designate like parts throughout the several views, and in which—

Figure 1 is a plan view of my invention. Fig. 2 is a front elevation thereof. Fig. 3 is a cross-section taken on the line 3 3 of Fig. 1, and Fig. 4 is a diagram of a circuit in which the specific arrangement of the impedance-coils and relays is found particularly useful.

The reference character 2 indicates a bar of metal, preferably cast-iron, in which a plurality of holes 3 are formed, preferably, by coring them out in the casting and then finishing them by reaming, drilling, or boring to the required size, such holes being arranged in two horizontal rows with the holes preferably one above the other. In each hole is placed a core 4, secured in position by means of a suitable screw 5, passed through the rear wall of the cast-iron shell, and threading into said core, and upon each core is located a magnet-coil 6, the terminals 7 of which pass through insulating-bushings 8 in the holes 9, formed in said rear wall, and thence into the end 10 of the spool of the magnet-coil. The ends of the coil of wire are wrapped about the said terminals 7 and soldered thereto in the usual manner. The lower row of holes is covered by a plate 11, of magnetic material, extending in front of the whole row and secured in place by the screws 12. Thus the magnetic circuit of said coils is completed through the material of the bar and the plate 11, and the coils are employed as retardation or impedance coils.

Each magnet of the upper row of holes is provided with a bent armature 13, poised upon the upper corner of the bar 2 as a fulcrum and secured in place thereon by the threaded pin 14, carrying the lock-nut 15 and passing loosely through an aperture in the depending portion of said armature. The said portion of the armature is adapted to be attracted by the magnet, and the horizontal extension thereof serves to operate the set of switch-springs forming the relay-

contacts or other part. These contacts consist of a plurality of superposed spring-strips 16, 17, and 18 with insulating-strips placed between and all clamped together and to the upper side of the bar 2 in proper position with reference to the armatures by means of the screws 19 19, passing through suitable insulating-bushings, the free ends of said springs extending to a point adjacent the horizontal part of the armature and the middle spring 17, projecting forwardly over said portion of the armature and resting upon an insulating-stud carried thereby. The lower springs are normally in contact, and when the magnet is operated the middle spring is separated from the lowermost spring and pressed into engagement with the uppermost spring to conform to the desired circuit changes. It is obvious that these contacts may be arranged in any desired number or manner, and any number of sets may be employed. The conductors of the electric circuit are intended to be soldered to the rear ends of said spring.

The bar 2 is conveniently supported upon a suitable rack 20 by means of lugs 21, cast integrally with the ends of said bar and engaging the pins 22, threaded into said rack 20, nuts 23 serving to secure the same in position.

The iron bar is planed or dressed off on the four faces to provide a finished exterior and the device is installed as a whole.

In Fig. 4, 24 and 25 indicate the tip and sleeve conductors of a telephone-line with which the connecting-jack J is connected, the former conductor including the winding of the line-relay R and connecting with the live pole of a common central battery B, while the other line-conductor 25 contains the winding of the retardation-coil 26 and connects with the grounded pole of battery B. The said relay R controls the local circuit of the line-signal S. In a circuit of this type it is convenient in installing the system to employ the device shown in the other figures, the coils in the lower row being used for the coils 26 of the telephone-lines and the relays above being used for the line-relays R of the same lines. In other words, each relay in the upper row and the retardation-coil below are connected in one and the same line.

While the invention has been described with particular reference to the details of construction, I do not wish to be so limited in all respects, as various changes and modi-

fications may be made therein and still come within its scope and principle.

I claim—

1. In a device of the class described, the combination with a metallic bar having a series of transverse holes formed therein, of electromagnet-coils fitting within said holes, a thin metallic strip covering the holes and providing a complete metallic circuit for each electromagnet, said bar forming a convenient mounting for said coils to enable them to be bodily mounted upon and detached from a suitable support, substantially as described.

2. In a device of the class described, the combination with a metallic bar having a series of transverse holes formed therein side by side, of an electromagnet-coil fitting within each said hole, a thin metallic strip covering the holes and providing a complete metallic circuit for each electromagnet, a support for the bar, and means for bodily securing said bar to said support and detaching the same therefrom whereby said series of coils may be conveniently mounted upon or dismounted from the support, substantially as described.

3. The combination with a bar of magnetic material having a series of transverse holes formed therein, of a core in each said hole secured to the rear wall of the same, and an electromagnet-coil on each core, a thin metallic strip for covering said holes, the said cores, rear wall, the material of the bar and said strip being included in the magnetic circuit of said magnet-coils, substantially as described.

4. The combination with a bar of magnetic material having a series of transverse holes formed therein from one edge and terminating short of the opposite edge of the bar, of a core in each said hole secured to the rear wall of the same, an electromagnet-coil on each core, a thin strip of magnetic material placed over the series of holes, whereby said coils are entirely inclosed in a magnetic sheath, and lugs carried upon the ends of the bars for suitably securing them in position, substantially as described.

Signed by me at Chicago, county of Cook, State of Illinois, this 12th day of June, 1903.

WILLIAM W. DEAN.

Witnesses:

ROBERT LOUIS AMES,
EVA A. GARLOCK.