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No. 896,808.

PATENTED AUG. 25, 1908.

F. L. DODGSON.

RELAY.

APPLICATION FILED MAR. 2, 1906. RENEWED FEB. 21, 1908.

3 SHEETS—SHEET 1.

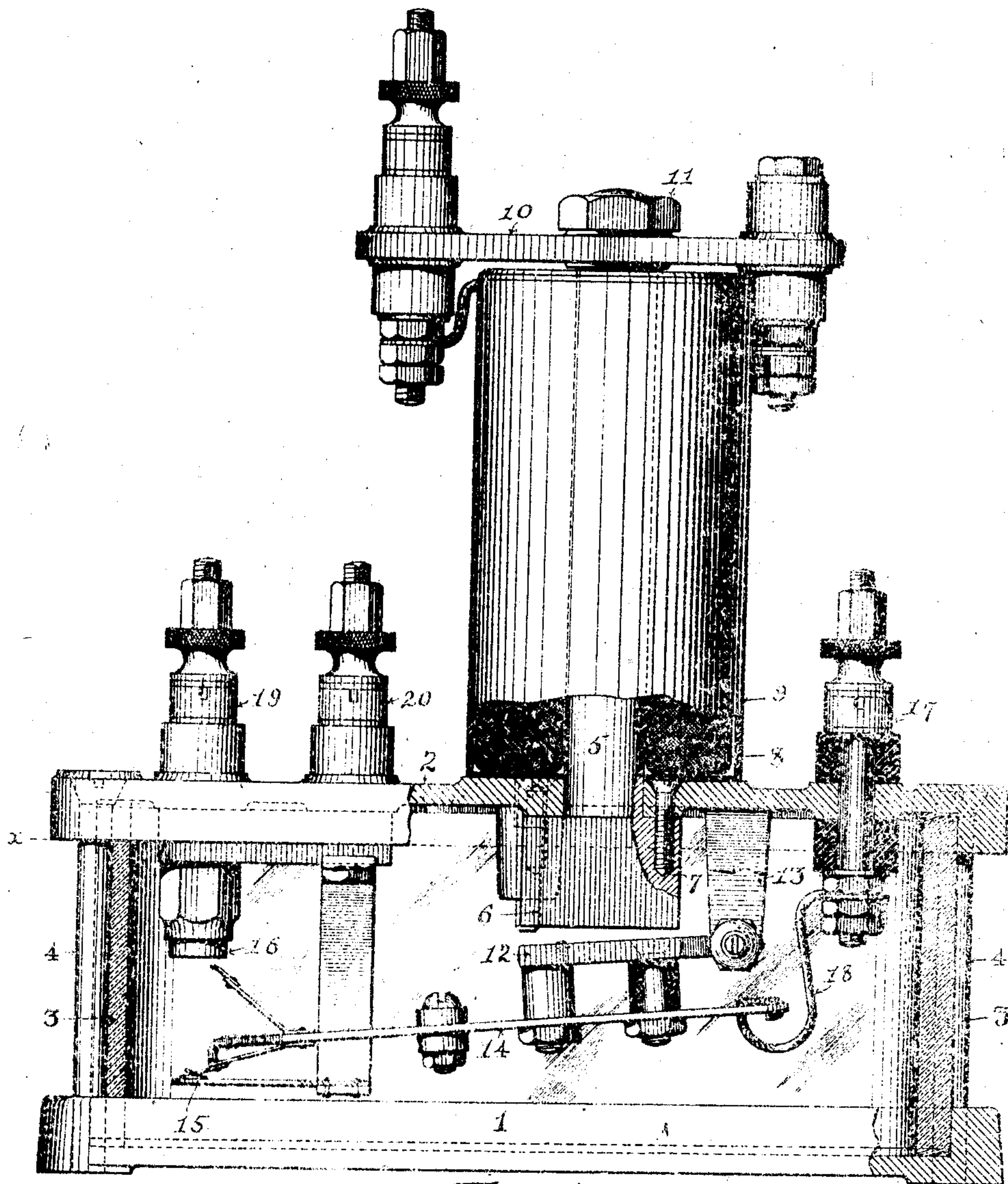


Fig. 1

Witnesses:

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3 SHEETS—SHEET 2.

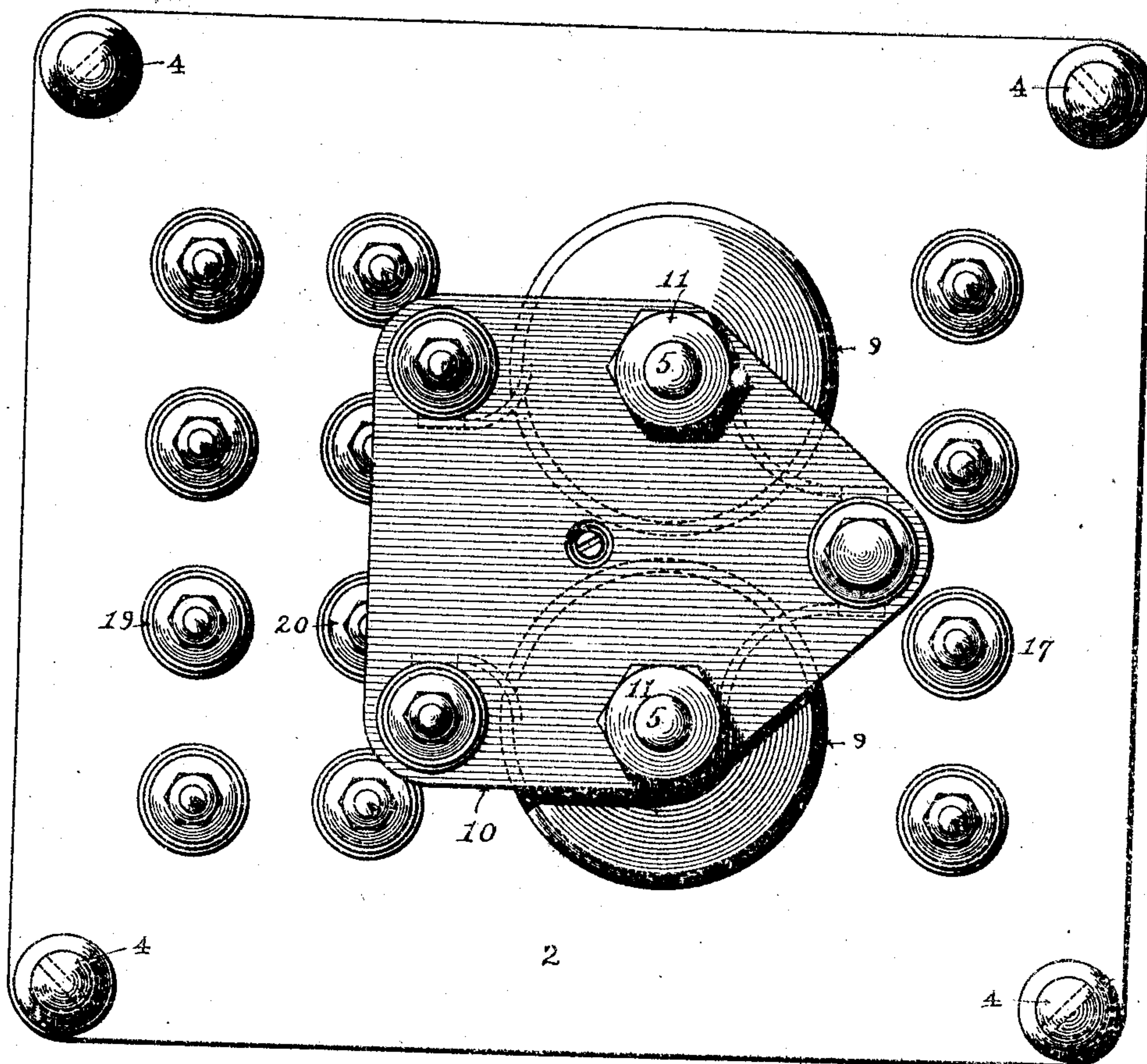


Fig. 2

Witnesses:

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3 SHEETS—SHEET 3.

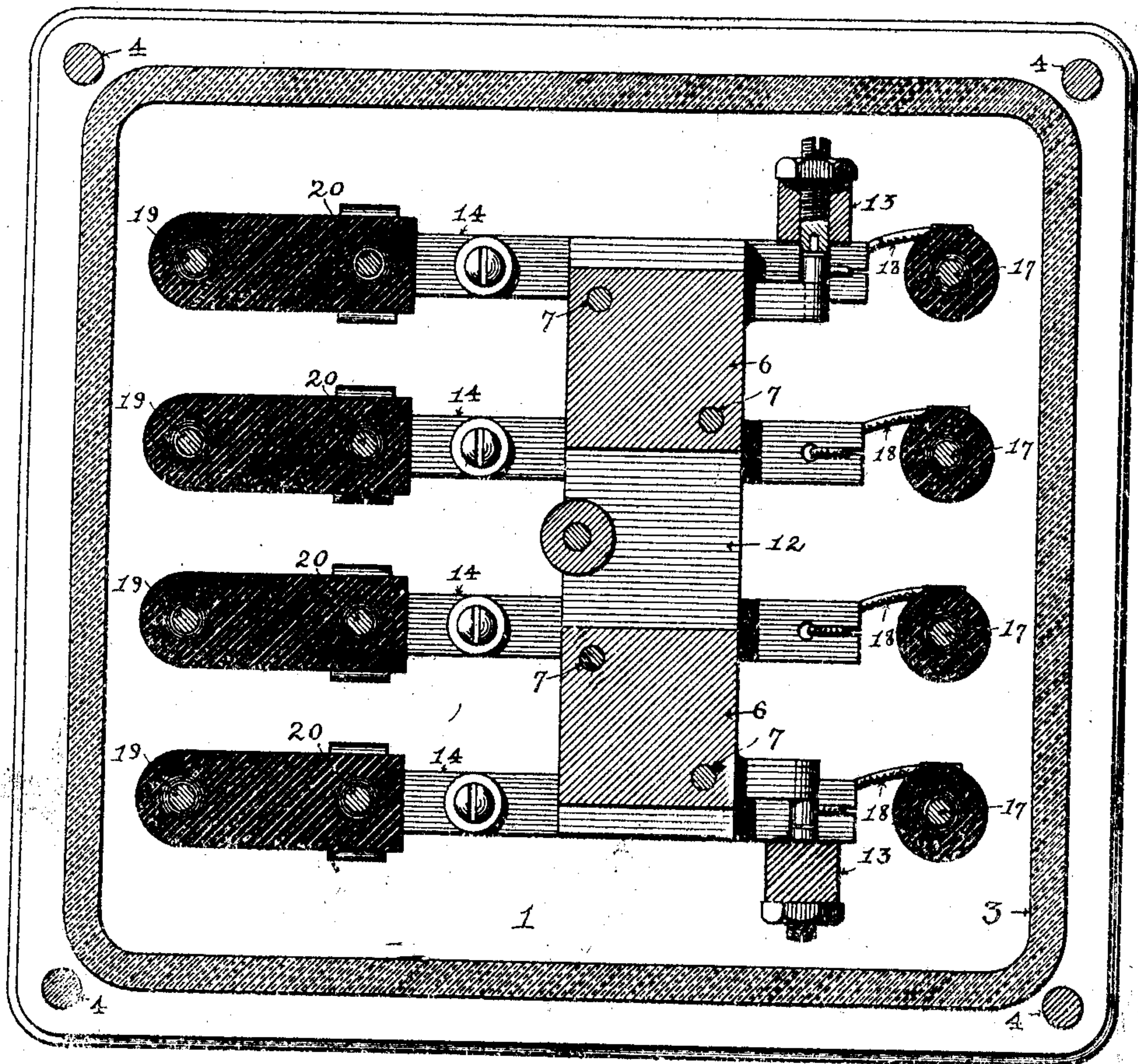


Fig. 3

Witnesses:

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UNITED STATES PATENT OFFICE.

FRANK LEMONT DODGSON, OF BUFFALO, NEW YORK, ASSIGNOR TO GENERAL RAILWAY SIGNAL COMPANY, OF BUFFALO, NEW YORK, A CORPORATION OF NEW YORK.

RELAY.

No. 896,808.

Specification of Letters Patent. Patented Aug. 25, 1908.

Application filed March 2, 1906, Serial No. 303,860. Renewed February 21, 1908. Serial No. 417,088.

To all whom it may concern:

Be it known that I, FRANK LEMONT DODGSON, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Relays, of which the following is a specification.

My invention relates to relays and more particularly to relays for railway switching and signaling apparatus. In relays for such uses certain requirements of construction and arrangement are imposed, which requirements for the successful operation are discovered and the necessary construction reached by experiment and test rather than by any predetermined engineering plan. I shall point out certain of these requirements, after describing my invention generally, and show how my invention meets the same.

In the drawings herewith I have shown a four-arm, eight-contact relay as a typical form of my invention.

Figure 1 is an elevation, partly in section; Fig. 2 is a top plan view; and Fig. 3 is a horizontal section on the line $x-x$ of Fig. 1.

Like characters of reference indicate corresponding parts.

The housing of the apparatus is made up of a base plate 1, a carrying plate 2, and a surrounding glass or other non-conducting body 3. The peripheries of the body 3 are seated within flanges on the plates 1 and 2, and the parts are held together by screws 4. With the use of water-proof cement this housing affords a damp-proof chamber for the working parts of the relay. The magnet cores are made up of cylindrical bodies 5 and rectangular and enlarged poles or ends 6. The bodies 5 of the cores fit snugly through holes in the carrying plate 2 and are secured to it by screws 7 passing through said plate and threaded into rectangular ends or two diametrically opposite corners. The windings 8 and the shells 9 are slipped over the cores 5 and held down firmly on the plate 2 by the binding post yoke 10, which, in turn, is held down by nuts 11 threaded to the upper ends of the cores 5. The yoke 10 carries the binding posts for the circuit of the magnets.

12 is an armature common to both magnet cores. This armature is pivotally secured to lugs 13 which are secured to the plate 2, and faces the rectangular ends 6 of the cores. Mounted with but insulated from the arma-

ture 12 are contact arms 14, which, when the magnets are deenergized, make electrical connection with the back contacts 15, and which, in the energized state of the magnets make electrical connection with the contacts 16. In the drawings, I have shown as the desirable construction for the uses in question carbon front contacts and platinum back contacts. The in-leading wires connect with the binding-posts 17, which are connected with their respective contact arms 14 by flexible conductors 18. The circuits of the front contacts 16 lead out through the binding-posts 19, and the circuits of the back contacts lead out through the binding-posts 20. All of the binding posts are secured to and through the carrying plate 2, are insulated therefrom and are damp-proof therein.

Having generally described my apparatus, I will point out the special features above referred to.

First, it is necessary that the working parts be symmetrically arranged, that the contact arms be equally and properly spaced and of the same length. Repeated experiment has shown these to be necessary features in the perfect working of the relay. This I have accomplished by making the base rectangular in form and making the housing rectangular in cross section. Thus the contact arms are of equal length, equally spaced and placed symmetrically with reference to the magnets and the magnetic field. This results in a higher efficiency and more perfect action.

Second, the rectangular and enlarged ends 6 of the cores secure an increased magnetic efficiency and an equality of magnetic pull and equality of release which I have not found attainable by any other form.

Third, by securing the cores to the carrying plate 2 by screwing the ends 6 thereto, and by making the shells and magnet windings readily removable simply by releasing the connections at the binding-posts, unscrewing the nuts 11 and removing the yoke 10, the coils of the magnets may be removed and replaced without in any manner disturbing the adjustment or the insulation against current or moisture of the other parts of the apparatus. This is of importance, since the replacement of a defective coil may be at any time made by one not possessing the necessary knowledge or skill to adjust the entire apparatus.

Fourth, by mounting all of the parts on the carrying plate liability to derangement, due either to expansion or contraction or to the loosening of parts, is reduced to the minimum.

Having thus described my invention and having indicated its features, what I claim is:

In a relay, in combination with the magnet coils, housing, and carrying plate, cores having enlarged and rectangular shaped ends or

poles, an armature governed by said magnets and means for securing said cores in place by securing said ends to said carrying plate.

In testimony whereof, I have hereinto set my hand in the presence of two witnesses.

FRANK LEMONT DODGSON.

Witnesses:

ISAAC R. NOBLE,
C. J. LEWIS.