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ELECTROMAGNETIC RECEIVING APPARATUS.
APPLICATION FILED SEPT. 5, 1907.

Patented Mar. 19, 1912.

1,020,402.

Fig. 1.

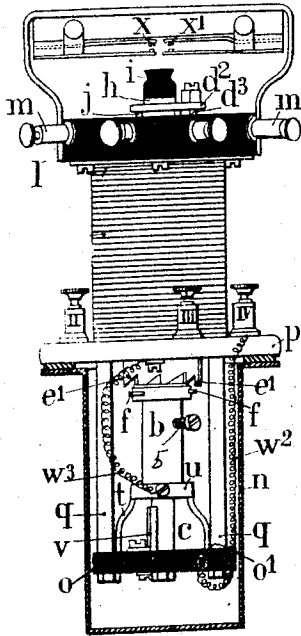


Fig. 3.

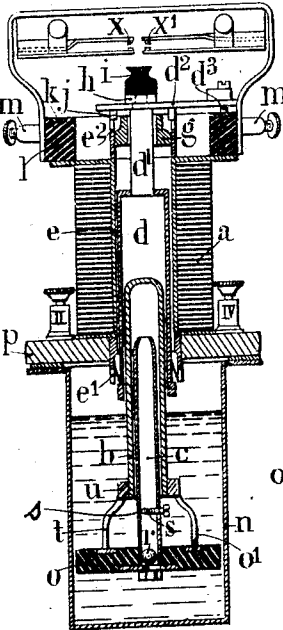


Fig. 5.

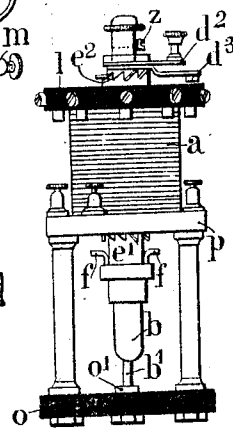


Fig. 6.

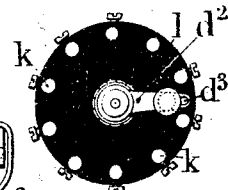


Fig. 2.

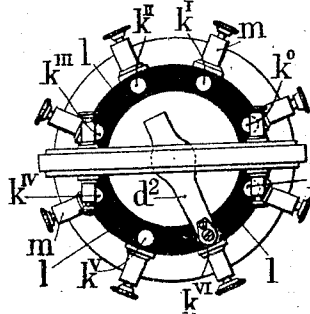


Fig. 4.

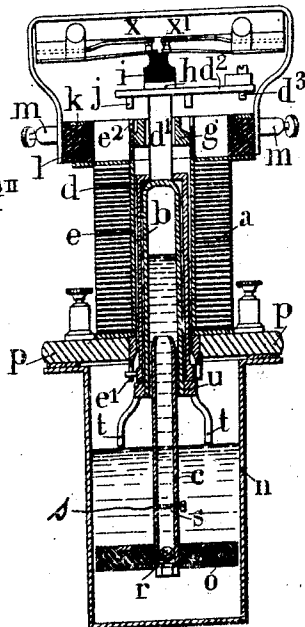
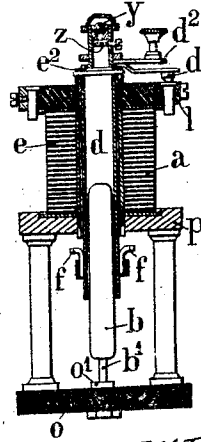


Fig. 7.



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ELECTROMAGNETIC RECEIVING APPARATUS.

1,020,402.

Specification of Letters Patent.

Patented Mar. 19, 1912.

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To all whom it may concern:

Be it known that I, JEAN BAPTISTE MARIE PIERRE HENRY ROSLIN D'IVRY, of Paris, Republic of France, have invented Improvements Relating to Electromagnetic Receiving Apparatus, of which the following is a full, clear, and exact description.

The present invention relates to an electromagnetic receiving apparatus.

The essential feature of this apparatus is to provide a device for insuring the distribution of the current in the utilization circuit, while at the same time retarding the contact in order to enable a contact key to pass over the several un-utilized contacts without closing the electric circuit.

The invention is hereinafter described with reference to the accompanying drawing, in which:—

Figure 1 shows in elevation, partly in section the part for the distribution of the current, which at the same time provides the necessary retardation in the contact by the employment of an appropriate liquid. Fig. 2 is a plan view thereof. Fig. 3 is a vertical sectional view. Fig. 4 is a vertical sectional view showing the parts in the raised position. Fig. 5 shows in elevation a device for the distribution of the current, which at the same time provides for the retardation of the contact by means of air. Fig. 6 is a plan view thereof. Fig. 7 is a vertical sectional view of the device shown in Fig. 5.

The distributing part which is shown in Figs. 1 to 4, utilizes an appropriate liquid such as petroleum for example. This part comprises broadly a coil α capable of attracting a core of soft iron b which is movably mounted on a central guide c in such a manner that it may ascend and descend inside of a movable cylinder d which is arranged in a tube e fixed to the coil α .

The movable cylinder d is provided at its lower end, with two studs f which are chamfered and arranged diametrically opposite one another. This cylinder d is surmounted by a rod d' which passes through a soft iron plug g and carries a cross piece d^2 forming a contact key. The cross piece is fixed to the rod by a metal nut h surmounted by a screw cap i of appropriate insulating material.

The cross piece or contact key d^2 is provided on its lower face with two diametri-

cally arranged chamfered studs j . The upper studs j and the lower studs f are arranged opposite toothed crowns e' e^2 which are formed on the upper and lower extremities of the tube e . The teeth of one crown are cut in the opposite direction to the teeth of the other crown. It follows from this arrangement that the vertical movements of the cylinder d will cause the rotation of the cylinder d and of the key d^2 which is carried thereby.

The key is provided at one extremity with a spring contact piece d^3 which is adapted to rest on the contacts k of an ebonite crown l so as to close an electric circuit to the member which it engages. In order that the key may move from one contact to another, it is necessary that the cylinder d should move up and down so that the teeth may rotate the cylinder carrying the key.

All the contacts are provided with terminals m radiating around the ebonite crown l from which the wires of the various circuits lead.

The contact retarding device, which is controlled by means of a liquid, comprises a cup n containing a certain quantity of petroleum into which the lower part of the guide c extends. This guide is mounted on an ebonite washer o which is connected with the base p of the device by means of rods q .

The guide c is tubular and comprises at its lower end a ball suction valve r and a lateral discharge orifice s , which is adjustable by means of a pin screw s . This screw serves two purposes: 1st it serves to retain the ball r ; 2nd, it is intended to serve as a controller of the escape of the liquid contained in the tube, by reason of the fact that the extremity of the screw, which is in the form of a point, penetrates more or less into the hole s which is exactly opposite this screw.

Two lugs t depending from the ring u , limit the downward movement of the core b . The ring u is electrically connected to the base p by means of a wire w .

A part v forms a screen for retarding the flow of the liquid through the discharge orifice s . This device being interposed in the circuit of a suitable relay, each time that current is caused to flow through the coil α by the transmitting mechanism which is connected to terminals II and III, the core b and the cylinder d are caused to ascend

until the head *i* of insulating material actuates the contacts *x* and *x'*, one of which closes the circuit say on an optical control for torpedoes, while the other is intended for controlling a decohering striker, in the case of the employment of Hertzian waves in wireless telegraphy. During the ascent of the core *b* and the cylinder *d*, the ball *r* will have risen, owing to the suction produced, thus permitting the liquid in the cup *n* to pass into and through the tubular guide *c* to fill the core *b*. This core *b* being full of liquid is maintained raised and is unable to descend together with the cylinder *d*, except in proportion to the flow of the liquid through the discharge orifice *s*, the cross section of which may be modified by means of the said pin screw. During the upward movement of the cylinder *d*, the lower studs *j* encountered the toothed crown *e'* and cause the cylinder *d* to rotate, thus advancing the arm *d'* half the distance that separates one contact *k* from the following one upon the crown *l*.

When the current ceases to act upon the solenoid *a*, the cylinder *d* descends again by gravity, and the upper studs *j* encountering the teeth of the upper crown *e'* impart a rotary motion to the cylinder *d*, causing the arm *d'* to advance the remaining half of the distance that separates two contacts *k*, in order to allow the contact piece *d'* to engage that contact which is next to the one which it engaged at the beginning of the upward movement of the cylinder *d*.

The advancement of the arm or key *d'* from one contact to another takes place then in two different periods; first period, during the rise of the cylinder *d*; second period, during the descent of the cylinder *d*.

Owing to the retarding action of the liquid, the core *b* will not reach the end of its downward movement until some time after the cylinder *d* has its lowermost position.

When the core *b* has completed its downward movement the lugs *t* will rest upon the circular block *o'* and the current of utilization passes from the terminal IV through the wire *w* to block *o'* to studs *t* to the cylinder *d*, thence by way of *d'* and *d''* to the contact piece *d'* and then by way of that one of the terminals *m* which is joined to that particular one of the contacts *k* which corresponds to the chosen control.

From the terminal *m* the current of utilization goes to the apparatus or to the machine which is to be set into action, and returns from this machine to the source of electricity by way of a return-wire.

The core *b* remaining raised, as just stated, the closing of the circuit will not take place between studs *t* and block *o'* until the liquid has reentered the cup *n* which it has left, so that time is afforded for operating the apparatus as will hereinafter ap-

pear in passing over several contacts of the manipulator, without forming contacts on the contact pieces *k* of the current distributing member.

In the modification represented in Figs. 5 to 7, the contact is retarded by the employment of air instead of a liquid. When the core *b* is attracted, the air in the cylinder *d* escapes through the ball valve *y* until the core strikes against a restriction formed in the cylinder, in order to produce the ascent of this cylinder in the tube *c*. The core *b* is only able to descend by virtue of gravity in proportion as the air reenters the cylinder *d* whereby the retardation of the contact is obtained. The duration of this retardation is regulated by means of a pin screw *z* enabling the air to reenter the cylinder *d* more or less rapidly. It will, of course, be understood that the said retardation might be obtained by a different arrangement.

In its lower position the core rests, by means of a tail piece *b'* on a small metal block *o'* fixed at the center of the washer *o* of the insulating material.

Having described the invention, what is claimed as new and what is desired to be secured by Letters Patent is set forth in the following claims.

1. In an electric telemechanic transmitting and receiving device, a tube provided with teeth at each end, a coil surrounding said tube, electrical connections to said coil, a cylinder *d* in said tube, studs *f*, *j*, at each end of said cylinder adapted to engage with the teeth on the tube whereby the cylinder will be rotated, a contact key on the cylinder, contacts *k* adapted to be engaged by said key, a tubular core *b* adapted to have movement within the cylinder *d* and adapted to be raised when the coil is energized so as to raise the cylinder, and means for retarding the lowering of said core when once raised.

2. A device of the class described comprising a tube *c* having teeth at each end, a coil *a* surrounding said tube, a cylinder *d* within the tube, studs *f*, *j*, at each end of the cylinder adapted to engage with the teeth to rotate the cylinder, a tubular core *b* placed below the cylinder *d* and having movement therein when the coil is energized, a guiding tube *e* on which the tube *b* is guided, a receptacle surrounding said tubes *b* and *c* and adapted to contain a fluid, a support for the guide tube *e* within the receptacle, a contact carried by said support, a valve at the lower end of the tube *c* adapted to control the entrance of fluid to said tube *c*, an adjustable outlet from said tube *c*, a contact key carried by the cylinder *d*, contacts adapted to be engaged by said key, and means for energizing the coil whereby the tube *b* will be raised, which in its turn raises

the cylinder *d*, which by means of the studs and teeth is caused to rotate, and liquid flowing into the tube *c* retards the return to normal position of the tube *b*, and contacts on said tube *b* adapted to engage with the contact on the support for the tube *c*.

The foregoing specification of my improvements relating to electric telemechanic

transmitting and receiving apparatus signed by me this 24th day of August, 1907.

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Witnesses:

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