I. KITSEE.

RELAY.

APPLICATION FILED OCT. 19, 1907.

900,743. Patented Oct. 13, 1908.

Fig. 2.

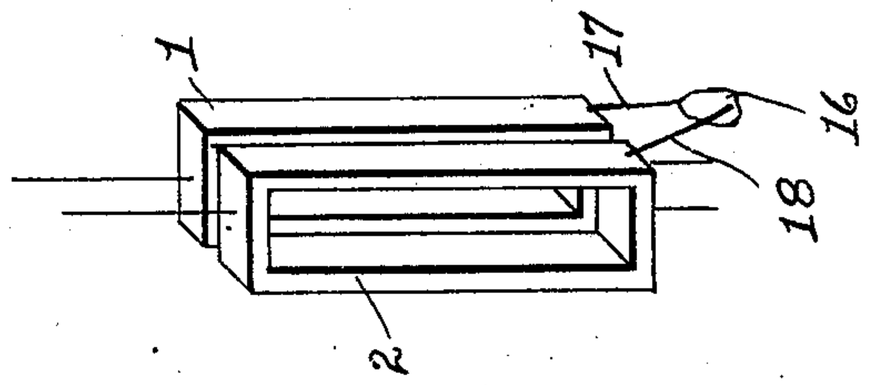
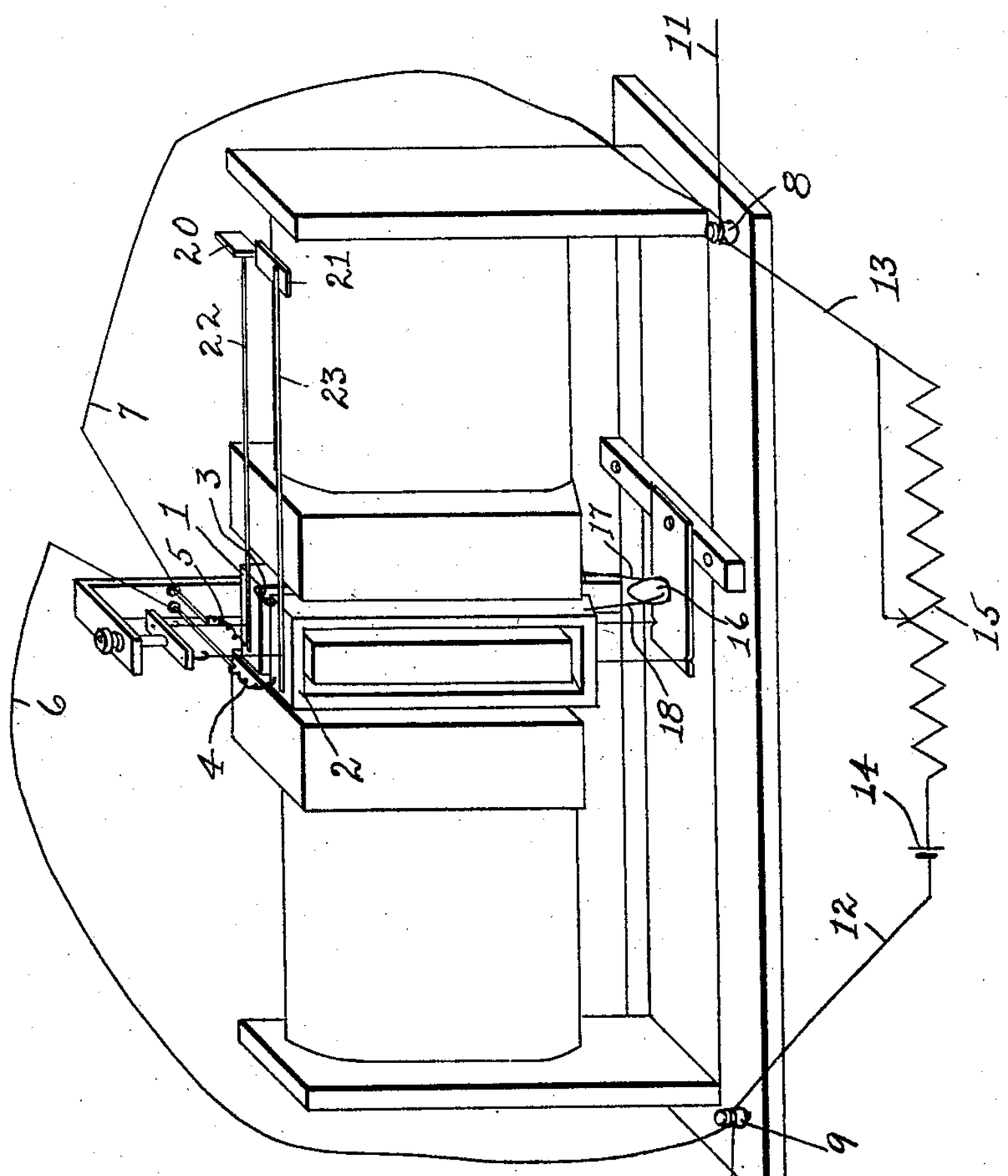


Fig. 1.



WITNESSES

Edith R. Stilley

Mary C. Smith

INVENTOR

Isidor Kitsee

UNITED STATES PATENT OFFICE.

ISIDOR KITSEE, OF PHILADELPHIA, PENNSYLVANIA.

RELAY.

No. 900,743. Specification of Letters Patent. Patented Oct. 13, 1908.

Application filed October 19, 1907. Serial No. 398,233.

To all whom it may concern:

Be it known that I, ISIDOR KITSEE, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Relays, of which the following is a specification.

My invention relates to an improvement in telegraphic relays, or receiving devices, and has more special reference to relays used in circuits of great capacity, such as submarine cables.

The peculiar condition of submarine cables makes it necessary that only a very feeble current is sent over the line and the receiving instrument has to be, therefore, of a construction adapted to respond to very feeble impulses. The well known siphon recorder of Lord Kelvin is for this reason almost generally employed in submarine work.

The movable parts of an instrument designed to respond to the feeble impulses of short duration, as used in the submarine cable, have to be so delicately suspended that the slightest jar or fluctuation of the current is apt to change their position, thereby making the instrument inoperative for the time being. To obviate this difficulty is the aim of my invention.

During the time of my experiments with submarine cables and receiving devices therefor, I have found:—

First: It is necessary—if the instrument should be used as a relay—that the contacts serving as the terminals of the relaying circuit should always be closed. But in practice, it is impossible, through mechanical means alone, to so adjust these contacts that the pressure should always remain stable.

Second: I have also found that the slightest variation of pressure between the two contacts will make the instrument on cable work unsatisfactory; and a cable relay must be adjusted in a manner, so that the relaying contacts shall normally connect, but the pressure should always be of a predetermined degree and should at the beginning be adjusted so as to respond to the incoming impulses.

After a series of futile experiments, I found that the arrangement, as illustrated in the drawing and later on described in the specification, is the most practical for the purpose in question.

My invention is applicable to different types of cable relays, but I have illustrated the same as being applied to a type which I use in cable telegraphy and found efficient therein.

In the drawing, Figure 1 is a perspective view of the relay as an entirety and Fig. 2 is a perspective view of the coils illustrating clearly the mechanical means to bring the same together, thereby closing the contacting arms attached to these coils.

In the drawing, 1 and 2 are the suspended coils. In the relay, as I have used it, these coils are connected in opposition as to each other and the means are here shown as the wire 3. The terminals of these coils are connected to the stationary contact through wires 4 and 5. One of the stationary contacts is connected through wire 6 with the binding post 9 and the other stationary contact is connected through wire 7 with the binding post 8. The two coils are suspended in a manner so that the contacting means 20 and 21 of the arms 22 and 23 are normally out of contact with each other. In the practical application of this relay, it is necessary first to bring the terminals 20 and 21 together. This I accomplish by connecting to each of the coils—preferably—a "cocoon fiber" and attach these fibers to the weight 16. In practice, this weight consists of a small piece of beeswax. The weight of this beeswax will pull the coils and therefore their attached arms and terminals together. The office of the weight 16 is, as said above, to close the relaying terminals 20 and 21, but the weight performs a second function and that is, to give the coils the necessary stability, without which a successful working would not be possible. But as the degree of pressure has to be greater than required for the purpose of steadying the coils, it is necessary to provide means to lessen this pressure, and after exhaustive trials, I found that this object can best be obtained through electrical means, and in the drawing these means are illustrated as a local shunt circuit comprising the source of current, here shown as the battery 14, the variable resistance 15 and the wires 12 and 13. The wire 12 is connected to the binding post 9 and the wire 13 is connected to the binding post 8. The connection of this shunt circuit to the coils has to be such that the current flowing through them is in a direction so as to cause the same to separate, thereby opening the formerly closed relaying contacts.

To balance the coils, that is, to close the

contacts with the required pressure, it is only necessary to vary the resistance of the shunt circuit in a manner, so that the action of the current on the coils should be just sufficient to hold the contacts together; and in the working of the instrument on different cables where different impuless of different strengths are employed, the relay proper does not need to be adjusted, but the adjustment takes place on the shunt circuit only, and the operator has only to increase or decrease the value of the resistance of said shunt for the purpose of producing the necessary degree of pressure between the two relaying contacts 20 and 21. From such adjustment, the great advantage arises that the relay proper never changes its sensitiveness to incoming impulses and does not need to be handled or adjusted for the purpose of meeting different requirements.

In the drawing, 10 and 11 are the terminals of the line of transmission, such for instance as a submarine cable.

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

1. In combination with a cable relay, means to bring the relaying contacts together independent of the incoming impulses and means to lessen the pressure of these contacts independent also of the incoming impulses one of said means comprising a localized electric circuit connecting in shunt said relay.

2. Means to adjust an electric relay, said means comprising mechanical means to normally connect the relaying contacts and electrical means to lessen the pressure of said contacts one of said means comprising a localized electric circuit connecting in shunt said relay.

3. In combination with an electric relay, two forces, a mechanical force to induce in the movable parts a movement in one direction, and electrical force to counteract said movement, both forces independent of the incoming impulses.

4. In combination with a relay in which the movable parts consist of two coils, each carrying a relaying contact, mechanical means to force both coils in a direction so as to close the relaying contacts, and an electric circuit shunting said coils and inducing in said coils a movement opposite to the movement induced by the mechanical means.

5. Means to adjust the movable coil or coils of a relay adapted to respond to feeble currents, said means comprising gravity means to induce in the coils a movement in one direction and electric means to induce in the coils a movement in the opposite direction, one or both of these means being adjustable said electric means independent of the electric impulses arrived over the line of transmission.

6. A cable relay carrying relaying contacts normally closed, in combination with means to adjust the pressure of said contacts as to each other, said means comprising mechanical means to move the movable parts in one direction and electrical means to move the movable parts in the opposite direction, both means independent of the incoming impulses.

7. Means to receive feeble impulses over a line with distributed capacity, said means comprising two movable coils connected in the line of transmission, a stationary field for same, mechanical means to retain the coils in one position and localized electric means, shunting said coils, to retain the same in a second position.

8. A cable relay comprising the relay proper, a localized electric circuit adapted to move the movable part in one direction and mechanical means to move the movable parts in an opposite direction said localized electric circuit shunting the relay proper.

9. A cable relay comprising two movable coils delicately suspended in the region of magnetic field, each coil carrying a relaying contact, means operatively related to said coils to normally close the contacts and means also related to said coils to oppose the force of the first means both coils connected in opposition as to each other and in series as to the line of transmission, one of said means mechanical and the second of said means electrical and independent of the incoming impulse.

In testimony whereof I affix my signature in presence of two witnesses.

ISIDOR KITSEE.

Witnesses:
MARY C. SMITH,
EDITH R. STILLEY.