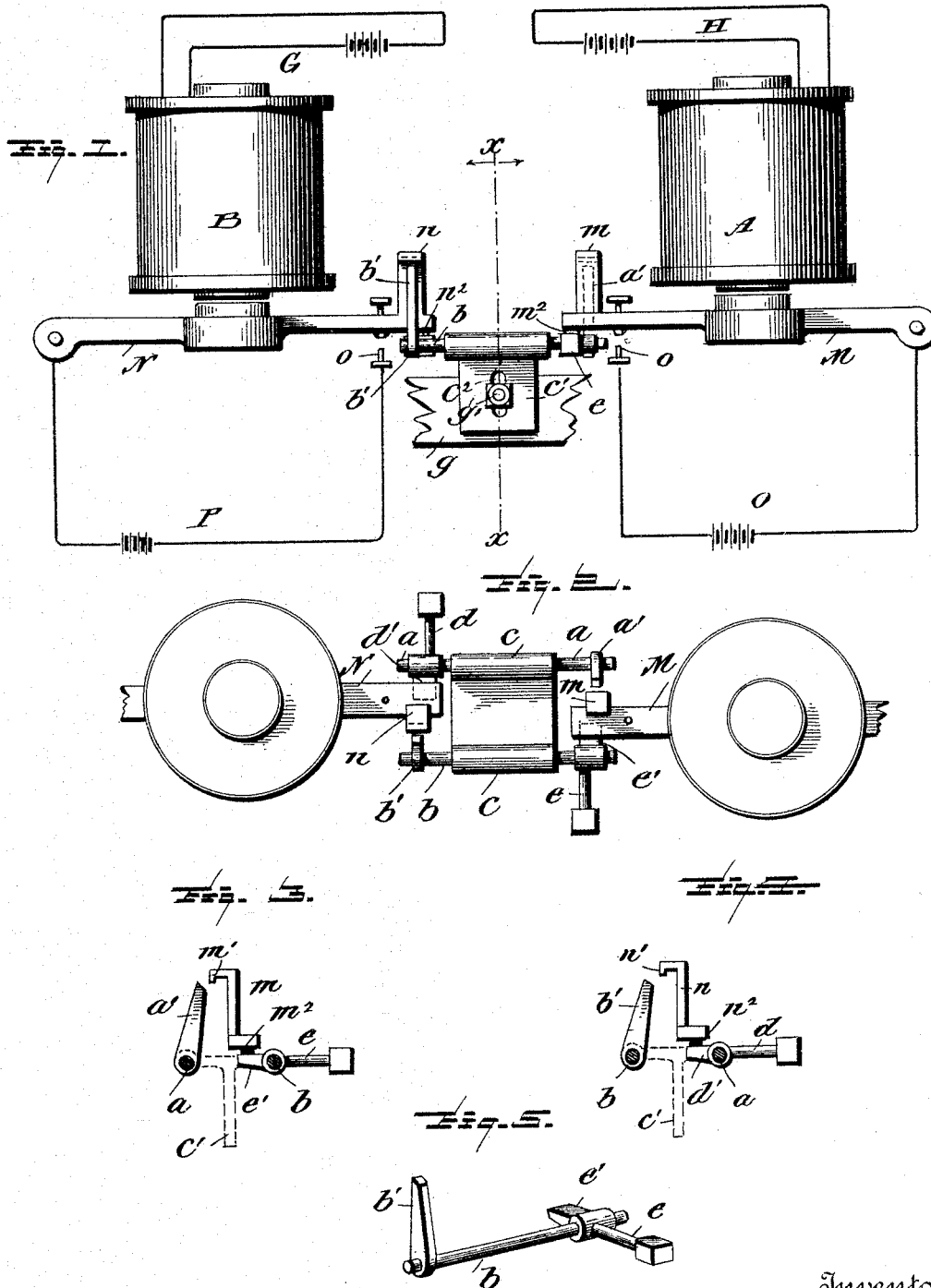


(No Model.)

J. W. LATTIG.
RELAY.

No. 492,689.

Patented Feb. 28, 1893.



Witnesses
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RELAY.

SPECIFICATION forming part of Letters Patent No. 492,689, dated February 28, 1893.

Application filed November 28, 1892. Serial No. 453,407. (No model.)

To all whom it may concern:

Be it known that I, JACOB WILLIAM LATTIG, of Easton, in the State of Pennsylvania, have invented a new and useful Improvement in Relays, of which the following is a specification.

My invention has relation to a double relay, comprising two separate magnets and armature levers therefor, and it is directed to means whereby after the normal condition of either one of the magnets has been reversed for the purpose of reversing or changing the portion of its armature lever, the armature lever of the other magnet will be incapable of work until the double relay shall have been restored to its normal condition. To this end I combine with each armature lever a mechanism controlled thereby for locking the other, whereby when either one of the said levers moves from normal position, the other lever will be locked or prevented from the movement requisite to enable it to perform the work for which it is intended until the first named lever shall have been returned to normal—the arrangement indeed being such that all parts of the relay must be restored to normal position and condition before the lever thus locked, can be in condition to perform its work. The object is to prevent interference between the two halves of the relay, so that when the one half of it has been called into action, the other half, so long as that condition of affairs continues, shall be incapable of useful work.

The nature of my invention and the manner in which the same is or may be carried into effect will be understood by reference to the accompanying drawings in which—

Figure 1 is a front diagrammatic elevation of the essential parts of a double relay embodying my invention, together with a system of circuits designed to illustrate one of the various uses to which the relay can be practically applied. Fig. 2 is a plan of the apparatus. Fig. 3 is a section on line x, x , Fig. 1 looking to the right. Fig. 4 is a section on the same line looking to the left. Fig. 5 is a perspective view of one of the rock shafts detached.

A, B, are two electro magnets, and G, H,

are the separate energizing circuits therefor, one for each magnet.

M, N are the armature levers of the magnets.

Each armature lever controls a mechanical locking mechanism for the other whereby whenever and so long as either lever is in action or is doing its work, the other is restrained from its work. The means which I have illustrated for this purpose consist of two parallel horizontal rock shafts a, b , held in insulated bearings c on a suitable base c' . Each having fast to it at one end a detent arm a' , or b' , and at the other end a weighted lever arm d , or e , with a tappet d' or e' on the other side of the shaft from the weight, which is to be struck by the appropriate armature lever on the descent of the latter with the effect of turning or rotating the shaft in a direction opposite to that in which it is rotated by the weight. Upon the free end of each armature lever is a standard m or n terminating at the top in a laterally projecting hook or catch m' or n' . These hooks or catches are to be engaged by the detents a', b' . The weights move the rock shafts in a direction to carry the detents out of the path of the hooks on the armature levers; and each armature lever when it strikes a tappet d' or e' rocks the shaft in a direction to bring the detent on that shaft in the path of the hook on the other armature lever. The detent a' of rock shaft a is to lock armature lever M, and the shaft for this purpose is operated by or from armature lever N. The detent b' of rock shaft b is to lock armature lever N, and the shaft for this purpose is operated by or from armature lever M. Each armature lever has applied to it a piece of insulation m^2 or n^2 at the point where it strikes the tappet d' or e' of the weighted arm d or e .

In the apparatus shown in the drawings the magnets are normally energized, and the armature levers are attracted by their magnets and drawn away from the detents; consequently the shafts a, b being free to rock are moved by their weights in a direction to carry the detents out from under the hooks on the armature levers. The parts are so proportioned and adjusted that either armature le-

ver on its back stroke will before completing that stroke depress the tappet appropriate to it far enough to rock the shaft to which that tappet is attached in a direction and to the extent requisite to bring the detent on said shaft under the hook on the other armature lever which consequently will be prevented from making its back stroke, or at least from making that portion of said stroke in which it performs the work for which it is designed, and this condition of affairs will continue until the parts are restored to normal position. A convenient means for securing the adjustment of the parts, is to secure the base c' to a support g on which it can slide up and down, and to connect it to said support by a set screw g' passing through a vertical slot c^2 in the base c' into the support g behind.

In illustration of one of the uses to which the apparatus is applicable, I have represented in Fig. 1 two separate circuits O, P, one for each armature lever, and containing contacts controlled by that lever. The armature levers are against their front stops and the circuits O, P are open. If now magnet A be de-energized its armature lever M will fall against its back stop o , thus establishing circuit O, and in so moving it will strike the tappet e' of shaft b and will throw the detent b' on that shaft into the path of armature lever N. The latter is thus restrained from movement and, so long as this condition of affairs continues, is incapable of closing its circuit or of interfering with the operation of the other circuit, because the only effect of de-energizing magnet B will be to permit its armature lever N to engage and interlock with detent b' , and this takes place before the lever can close its circuit or can operate on shaft a . Consequently before the circuit P

of armature lever N can be closed, all parts must be returned to normal position. Then by de-energizing magnet B, the armature lever N will be free to move to close its circuit P, and in so doing will in its turn lock the armature lever M against useful movement.

Springs manifestly can be substituted for the weights on the rock shafts, and the apparatus in other obvious respects can be modified without departure from the invention.

Having described my invention and the best way now known to me of carrying the same into effect, what I claim as new, and desire to secure by Letters Patent, is—

1. A double relay comprising two independently energized electro magnets, and armature levers therefor, and a separate and independent locking mechanism for each armature lever operated from and controlled by the other armature lever, the arrangement being such that whenever and so long as either lever is in action that locking mechanism only which is operated from and controlled by it, will be operative substantially as and for the purposes hereinbefore set forth.

2. Two independently energized electro magnets and armature levers therefor, in combination with two weighted rock shafts each having a detent to engage one lever, and a tappet to be operated on by the other lever, for the purpose of throwing the detent into the path of the lever which it is intended to engage, substantially as hereinbefore set forth.

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

JACOB WILLIAM LATTIG.

Witnesses:

OSMAN F. REINHARD,
HARRY C. FREY.