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2,754,390

ELECTROMAGNETIC RELAY

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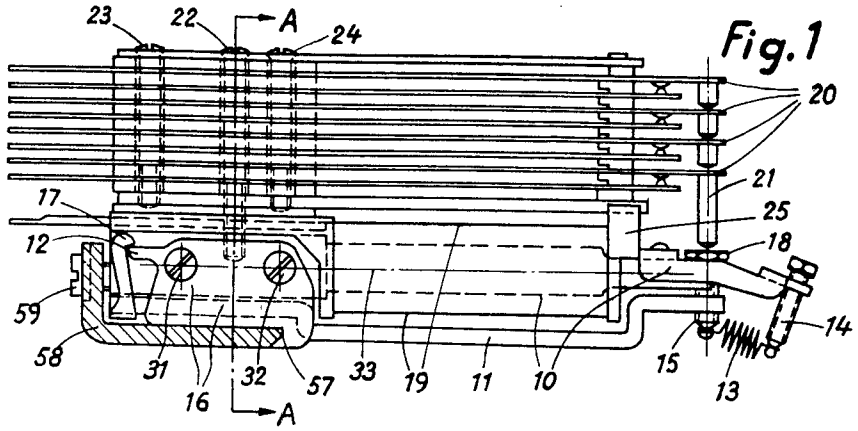

Fig.1

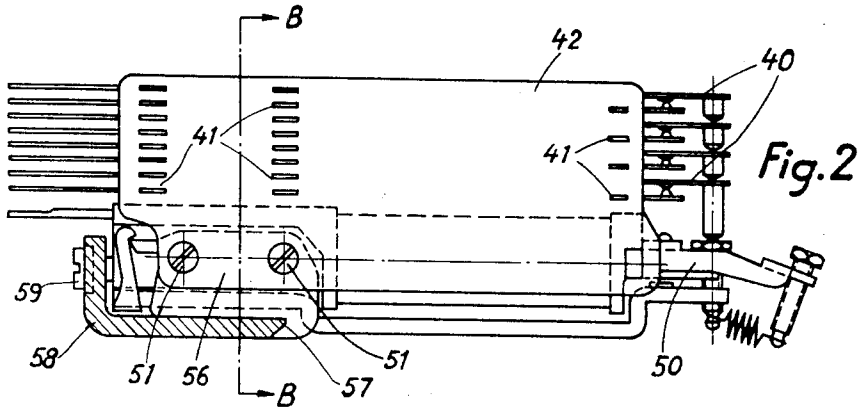

Fig.2

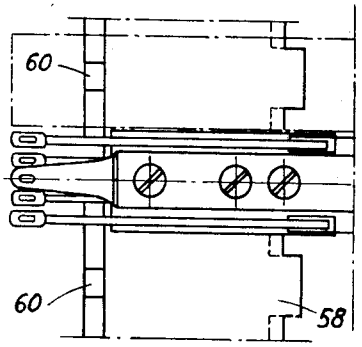

Fig.5

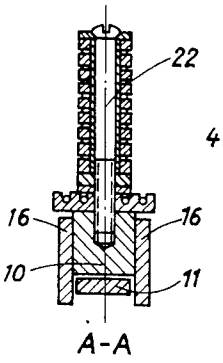

Fig.3

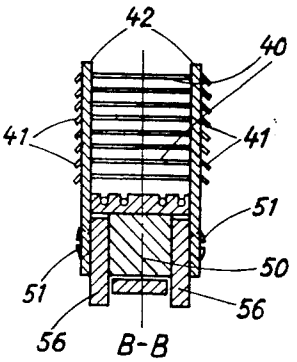

Fig.4

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ELECTROMAGNETIC RELAY

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3 Claims. (Cl. 200—104)

The present invention relates to such electromagnetic relays as have an armature going along the iron core. The object of the invention is to obtain a simple and cheap relay by simplifying the device for the suspension of the armature. According to the invention this is achieved by having the armature, which is cradled against an edge at one of the ends of the iron core, both press against the edge and be kept in its unactuated position by means of stretching means located in the other end of the iron core.

The invention will be described more closely with reference to the accompanying drawing. Figs. 1 and 2 show side-views of two different embodiments of a relay. Figs. 3 and 4 are cross-sections along the lines A—A and B—B respectively of the relays according to the Figs. 1 and 2. Fig. 5 shows how several relays can be mounted beside each other on a common supporting bar.

The electromagnetic relay shown in Fig. 1 has an armature **11**, which is going along the iron core **10** and is cradled against an edge **12** at the back end of the iron core. At the front end of the iron core there is a spring **13**, one terminal of which is fastened to an adjustable screw **14** on the iron core, the spring being arranged to exert such an attraction on the armature, that it both presses the armature against the edge **12** by means of its back portion **17** and keeps it in the unactuated position shown in Fig. 1. This takes place so, that the spring **13** is fastened to a lifting screw **15** on the armature **11**, the screw being in its upper end provided with a nut **18**, the lower edge of which is drawn towards the iron core **10** under action of the spring **13**. Upon action of said nut, the distance of the armature to the iron core can be adjusted. When the winding **19** of the armature is energized, the front portion of the armature is drawn upwards towards the iron core, the lifting screw **15** thereby also being drawn upwards and lifting the actuating means **21** of the contact springs **20**, so that the illustrated four closed contacts are broken.

The edge **12**, against which the back portion of the armature presses, consists of two side pieces **16** placed on both sides of the iron core **10** as appears from Fig. 3. By means of screws **31**, **32** the side pieces and therewith also the edge **12** are fastened to the iron core. The edge has been placed so, that a line drawn from the edge to the upper surface of the lifting screw **15** on the nut **18**, Fig. 1, is chiefly parallel to the longitudinal axis or central line **33** of the iron core. The two ends of the iron core **10** are at the parts lying nearest to the armature **11**, shaped as magnetic poles for the armature, said poles attracting the armature in the same direction as it actuates.

The embodiment of the relay shown in Figs. 2 and 4 differs from the one shown in Figs. 1 and 3 only by the connection of the contact spring set and the iron core to each other.

The contact springs shown in Figs. 1 and 3 are arranged in a set which is directly fixed to the back end of the iron core by means of a screw **22**, Figs. 1 and 3. There are

two further screws **23** and **24** for guiding the contact springs in the set. At the front end of the iron core the contact spring set is guided by a recess in a flange **25** on the iron core.

As distinguished therefrom, the contact springs **40** according to Figs. 2 and 4 are fixed by means of studs **41** on guiding flanges **42** of insulating material, no layers separating the springs. At the same flanges **42** the iron core **50** and the side pieces **56** are fixed by means of screws **51**, **52**.

The shown side-pieces **16** and **56** are provided with recesses **57** to allow single relays to be fixed to a supporting rib **58**, Figs. 1, 2 and 5, common to one or several relays. (Said supporting rib is not shown in Figs. 3 and 4). In Fig. 5, a relay mounted on said supporting rib is shown; it is fixed by means of the screw **59** shown in Figs. 1 and 2. Besides said mounted relay, other relays can be fixed to the supporting bar according to Fig. 5 at the shown recesses **60** and similar, not shown recesses, located beside the shown ones.

We claim:

1. An electromagnetic relay comprising an actuating coil having an iron core and an elongated armature having an offset hook portion at one end, a core member having two ends, a first edge at one end of said core engaged by said hook portion of said armature, resilient tension means at the other end of said armature connected to the other end of said core to exert a pull to keep said hook portion of the armature in engagement with the pivot edge and to exert a pivotal force biasing the other end of the armature away from said core, a plurality of contact springs, a lifting screw on the said other end of said armature piercing a portion of said core member and having an adjusting nut, actuating means on said contact springs extending toward said lifting screw, the said adjusting nut acting to limit the unenergized position of said armature.

2. A relay comprising in combination an electromagnet, an iron core in said electromagnet, an elongated armature extending parallel to said core and adapted to be attracted thereto, means on one end of said electromagnet forming an edge adjacent one end of said iron core, said armature having one end thereof bent to be pivotally received by said edge, an element secured to the other end of said core forming an obtuse angle therewith and extending beyond the other end of said armature, a spring resiliently joining between the distal end of said element and the said other end of said armature to apply a tension force thereto and simultaneously press the said one end of said armature against said edge to bias the said other end of said armature away from said core, a plurality of contact springs arranged to be actuated by motion of said armature, a lifting screw fixed on the said other end of said armature piercing said core and having an enlarged member thereon to engage the core and limit the motion of said armature when the electromagnet is unenergized.

3. The invention as set forth in claim 2, including means connected to said contact springs and extending toward said lifting screw to transmit armature thrust to the said contact springs.

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