

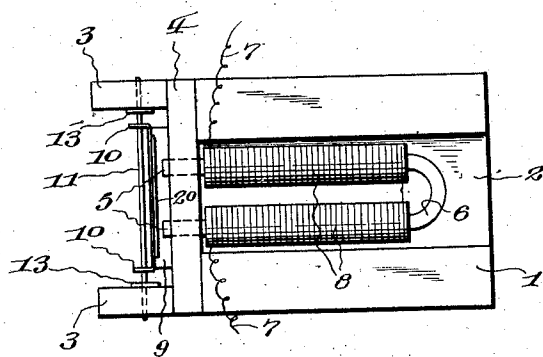
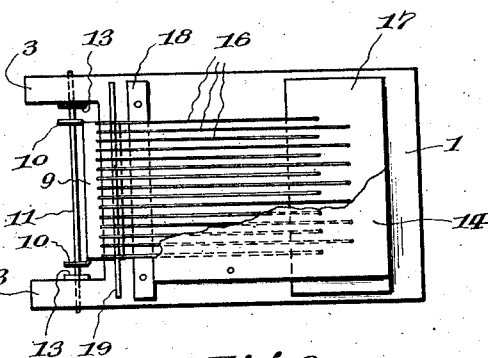
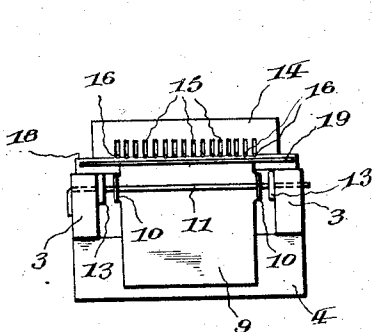
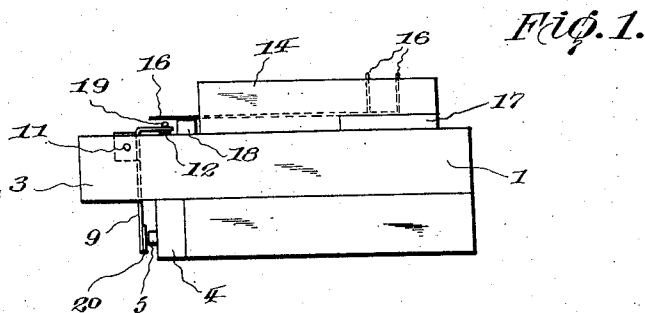
Aug. 23, 1927.

M. H. SAMPSON

ORGAN RELAY

Filed July 23, 1923

1,639,901



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## UNITED STATES PATENT OFFICE.

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## ORGAN RELAY.

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The invention relates to improvements in musical instruments, and particularly to such instruments of the electrically operated type.

Primarily the object of the invention is the provision of a novel electrical relay adapted to be interposed in the key circuit of an electrically operated musical instrument, whereby other instrumentalities having harmonious relation to the note produced on operation of the particular key are actuated on depression of the key.

Other objects will appear from the description, to those skilled in the art, and with such in view the invention resides in the novel construction, combination and arrangement of parts, hereinafter described and claimed, and illustrated in the accompanying drawings, of which:—

Figure 1 is a side elevation of a relay constructed in accordance with the invention,

Figure 2, and end view thereof illustrating the armature mounting,

Figure 3, a top plan view, with a portion cut away, and

Figure 4, a bottom plan.

In the preferred embodiment as illustrated, the relay is adapted for use in electrically operated pipe organs, being interposed in the key circuit, one for each key. It is obvious that it may be used as well in the case of pianos, and other such instruments as desired.

In detail it consists of a base block 1 of wood or suitable insulating material provided on its under face with a deep, relatively wide longitudinal groove or channel 2, the sides of the block being continued at one end an appreciable length to provide the arms 3 which are in depth only half the depth of the block.

Extended across the end of the block adjacent the arms 3 is a strip 4 of insulating material, secured to the block and supporting the poles 5 of a horse shoe magnet 6, the body of which is disposed within the channel 2. The pole pieces 5 project through and slightly beyond the strip 4, and are supported therein in rigid relation so that the strip and magnet form in effect, a unit of assembly. Lead wires 7 from the magnet coils 8 are adapted for connection in the circuit of an organ key (not shown). The armature of the relay consists of a substantially L shaped plate 9 of suitably magnetic material provided with upstruck ears 10 at

each side thereof, and is pivotally mounted on a rod 11 passed through the arms 3 and plate ears 10. These ears are so arranged that the short arm of the armature plate will extend inwardly of the block and rest on a pad 12 on the upper face of the base block. The ears 10 extend in a direction opposite to that of the short arm of the armature plate, and approximately from the bend of the L, so that in the normal horizontal position of the block the weight of the long arm will serve to space the armature from the magnet poles as shown in Figure 1. The width of the armature plate is appreciably less than that of the block so that a clearance is provided between the arms 3 and ears 10 for free movement of the armature. Insulating washers 13 are disposed between the ears and arms on the pivot rod 11.

Detachably secured to the upper face of the base block is a contact block 14, of insulating material and provided with a plurality of longitudinal grooves 15 in its under face to receive and guide lead wires 16 of a plurality of circuits, containing bells, chimes, etc., of the same pitch as that of the key. The various instrumentalities of the different circuits are selective through the medium of the usual master key or stop construction. The wires 16 are spaced from the upper face of the base block by means of a spacer strip 17 at one end beneath the contact block, through which end the wires are passed to the grooves 15. All of the wires 16 project beyond the opposite end of the contact block and terminate in a common plane over the short arm of the armature plate, being spaced thereabove by a spacer strip 18 supporting the ends of the wires. Secured on the upper face of the short arm of the plate 9 and at the end thereof, is a transverse contact bar 19 which on elevation serves to engage the projecting ends of wires 16 with a wiping action and thereby close the various circuits to actuate the instrumentalities controlled thereby. A pad 20 is disposed on the armature plate adjacent the pole pieces of the magnet to prevent clicking when the armature is drawn in on energization of the magnet.

In operation, as each organ key is pressed, the corresponding relay magnet will be energized and the armature plate will be rocked on its pivot elevating the contact bar to engage the supplementary circuit wires and close the circuits in which they are inter-

posed. While all supplemental circuits are closed at this point, only those rendered operable through the control means employed will function, the various instrumentalities being selective. The mounting of the armature plate permits the armature to return by gravity on deenergization of the magnet, eliminating use of springs. Return of the armature lowers the contact bar and breaks the supplemental circuits.

While I have illustrated and described certain details entering into the construction and operation of the invention, I desire it to be understood that I do not intend that it should be limited to such, but that any changes and modifications may be made therein as will fall within the scope of the invention as claimed.

I claim:—

20 A relay comprising a horizontal insulating base block having a longitudinal channel in its under face and extending from end to end, said block having the upper portion of one end extended at each side to form a pair of arms of reduced thickness, an insulating strip secured across one end of said channel to said block beneath said arms, an

elongated horse shoe magnet having the two ends of the core thereof passed through said strip for support of said magnet with the body of said magnet extending into and being housed within the channel of said block, an L-shaped armature plate having a depending long arm and a horizontal short arm, integral ears extending at right angles from opposite side edges of the long arm of said armature plate directly adjacent the bend thereof, a pivot rod passed through said block arms and plate ears for pivotal suspension of the armature with the long arm thereof depending adjacent the poles of said magnet and the short arm thereof extending oppositely from the ears, and in the direction of the magnet, a contact block detachably secured on the upper face of said base block, a plurality of circuit leads disposed in said contact block and extending over the short arm of said armature plate, and means carried by the short arm of said armature plate for simultaneous circuit closing engagement of all of said circuit leads upon energization of the magnet.

In testimony whereof I affix my signature.

MAURICE H. SAMPSON.