R. HOPE-JONES.

ORGAN STOP MECHANISM.

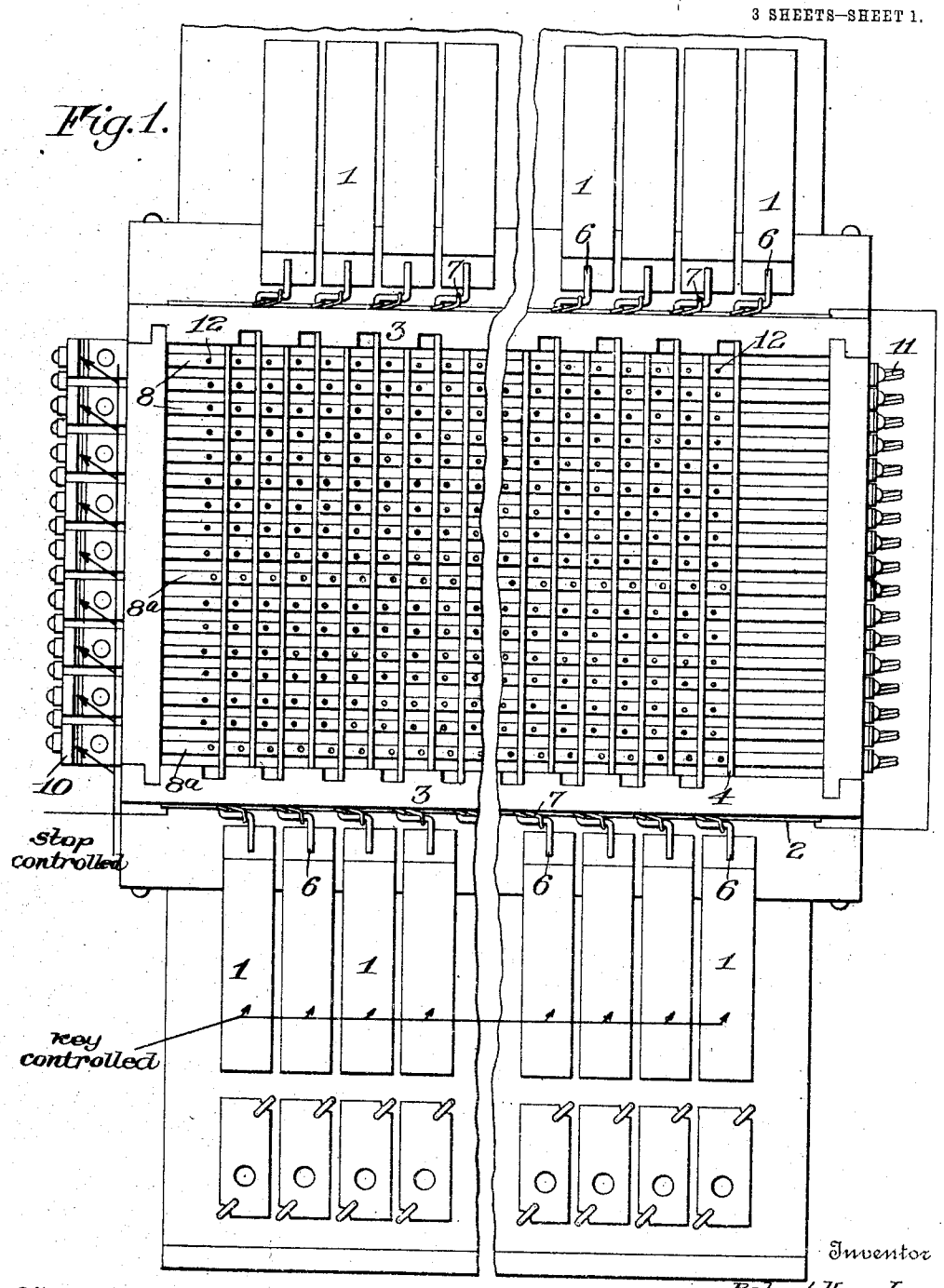
APPLICATION FILED DEC. 27, 1910.

1,077,075.

Patented Oct. 28, 1913.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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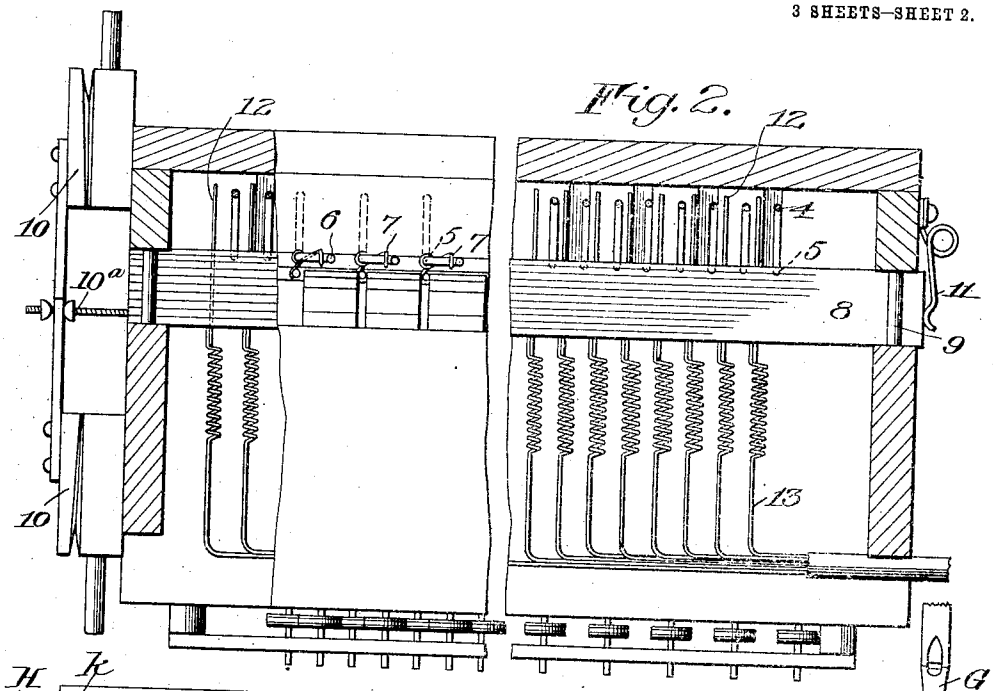
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3 SHEETS—SHEET 2.

Fig. 2.



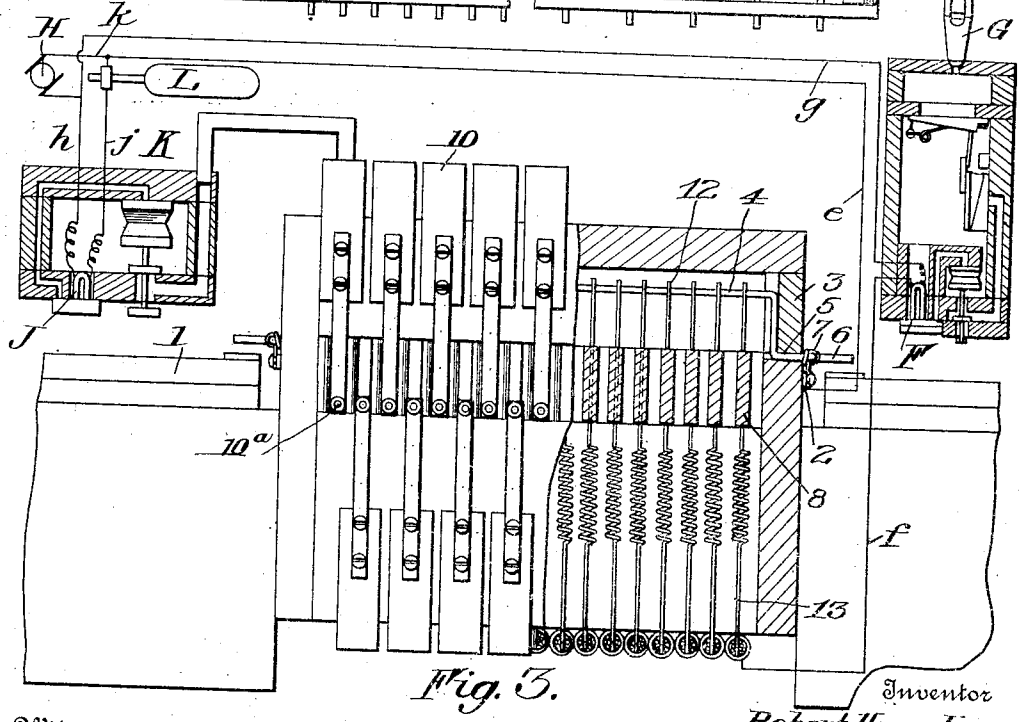


Fig. 3.

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3 SHEETS—SHEET 3.

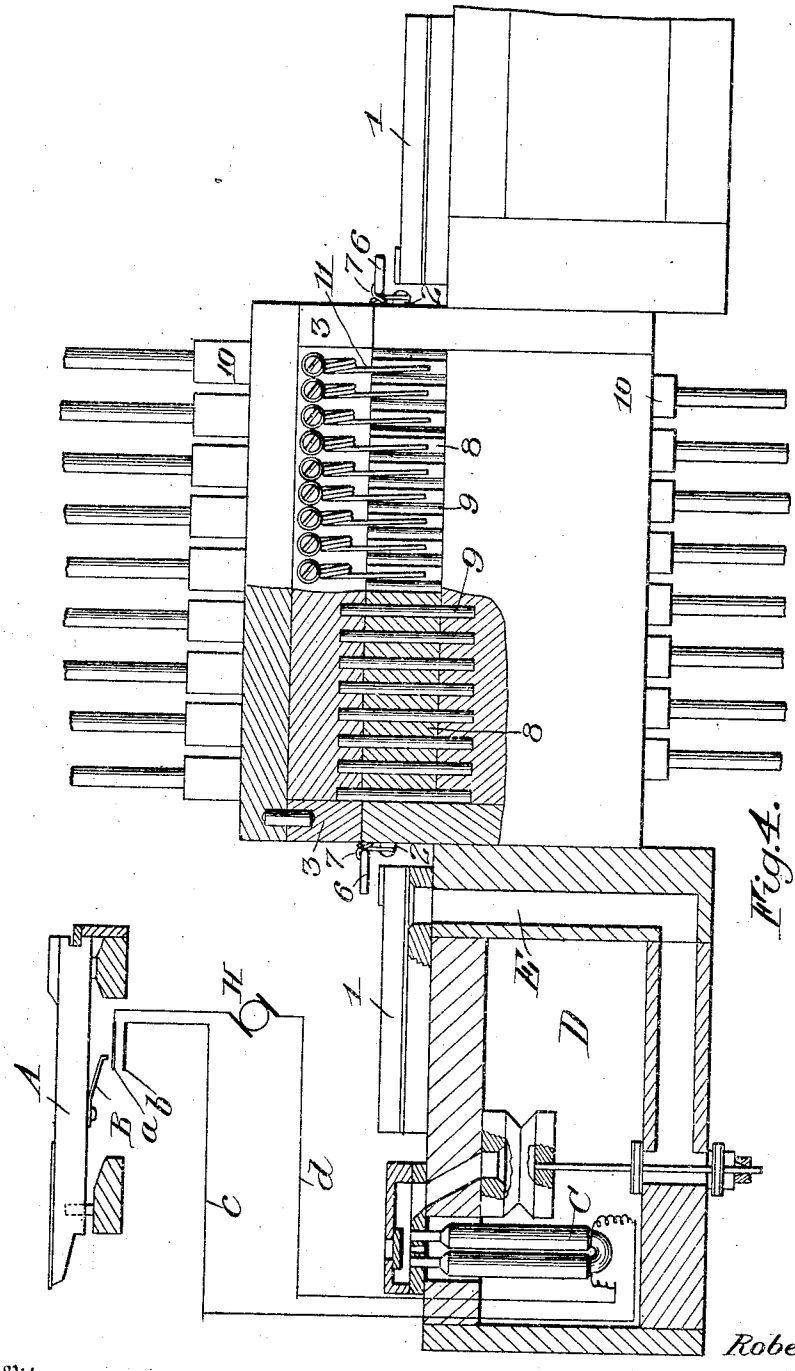


Fig. 4.

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UNITED STATES PATENT OFFICE.

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ORGAN STOP MECHANISM.

1,077,075. Specification of Letters Patent. Patented Oct. 28, 1913.

Application filed December 27, 1910. Serial No. 599,431.

To all whom it may concern:

Be it known that I, ROBERT HOPE-JONES, of North Tonawanda, in the county of Niagara and State of New York, have invented certain new and useful Improvements in Organ Stop Mechanism; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

My present invention relates to musical instruments and more particularly to organs, or instruments having a general construction similar to that of an organ, and it has for its object to provide in an electrically operated organ a simple and efficient mechanism for making the circuit connections from the keys of the manual to the pipe operating means under the control of the organ stops.

A further object of the invention is to render such mechanism light and compact and easy of manufacture.

To these and other ends the invention consists in certain improvements and combinations of parts all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings: Figure 1 is a top plan view of a stop mechanism constructed in accordance with and illustrating one embodiment of my invention; Fig. 2 is a side elevation, partly in vertical section; Fig. 3 is an end elevation, partly in vertical section, and showing, diagrammatically, the circuit connections thereof so far as they include the stop key and the operating mechanism of one of the pipes or tone producing elements; and Fig. 4 is an elevation of the opposite end of the mechanism, also partly in section, showing, diagrammatically, the circuit connections to the playing keys.

Similar reference numerals throughout the several figures indicate the same parts.

In the present embodiment of the invention I have illustrated the improvements in connection with a wind instrument or pipe organ, and referring more particularly to Fig. 4 of the drawings A indicates a playing key on an organ manual, the immediate result of the depression of which is to cause a finger B thereon to connect the contacts *a*, *b* to close the circuit *c*, *d* through the coil of an electro-magnet C. This magnet controls the valve that supplies air from a wind chest D through a passage E to a bellows 1 and when energized causes the inflation of the bellows 1, a detailed description of the mode of operation being unnecessary herein. This inflation of the bellows 1 closes an independent circuit for operating an individual pipe or element of the organ, which circuit we will pick up at the wire *e* in Fig. 3. This wire leads to a metal plate 2, in the present instance, which is secured to the side rail of a suitable guide frame 3 and is electrically connected to a plurality of parallel contact bars or members 4 pivoted at 5 in the side rails. The body portions of these bars are offset or yoke-shaped, as clearly shown in Fig. 3, and extend parallel with their axes of rotation on which they have a limited motion in a given path when a crank arm 6, connected to each and a series of which extend above the respective bellows 1, is turned by the inflation of one of the latter. The bars may be returned in any suitable manner upon the collapsing of the bellows, as by the springs 7.

Extending transversely beneath the contact bars 4 are a plurality of longitudinally movable slide-bars 8 arranged parallel with each other in a row extending across the guide frame 3. The bars are guided in any suitable manner sliding, in the present instance, between pins 9 in the end rails of the frame and their ends preferably project beyond these rails, as shown. Each bar is moved longitudinally in one direction by the inflation of a bellows 10 connected to a projecting extension 10^a thereof and is returned by a spring 11 on the guide frame that engages the opposite end of the bar. The bars, and each of them, are provided with a plurality of upstanding contacts 12 corresponding in number to the pivoted contact bars 4, there being one such contact on each slide bar for each contact bar. When one of the bellows 10 is inflated the slide bar that it actuates is moved to a position in which its contacts 12 are respectively brought into the paths of movement of the several swinging contact bars 4. The bars marked 8^a are in such positions in Fig. 1 while the others are in normal position to which latter all are returned, when the pressure in the bellows is relieved, by the springs 11, as before stated.

Each contact 12 on each slide bar is connected to a wire 13 that issues at *f* into the

same circuit, in the present instance, that includes the wire *e*, heretofore referred to and which is connected to the contact bars 4. From *f* the circuit leads to the electromagnet F of a suitable mechanism for operating a tone-producing unit or pipe G and this mechanism may be constructed in substantial accordance with the disclosure of my pending application for a patent on valves, filed July 15, 1910, Serial No. 572,082. The rest of the circuit comprises the wire *g*, generator H and wire *k* back to wire *e*, contact bar 4 and slide bar contact 12. There is a contact 12 on each slide bar for each pipe or unit of the series controlled by that bar and there is a contact bar 4 for each playing key on the manual. Therefore, when the bar is operated, all the circuits are ready to be closed by the actuation of their respective keys.

The means for controlling the bellows 10 and operating the slide bar includes a second circuit energized by the generator H and leading by a wire *h* through the coil of a magnet J that controls the supply of air between the bellows 10 and a wind chest K. From the magnet it leads by wire *j* through a stop key L back through wire *k* to the generator. The stop key L is in the nature of a switch and when the key is drawn the circuit is established, the slide bar moving into operative position. There is, of course, a separate stop key and circuit for each bar, the drawings showing only a single unit and being only intended to illustrate diagrammatically, and as simply as possible, the general scheme of which the improvements of this invention form a part.

The general operation is the general operation of the ordinary organ. It being understood that there are as many pneumatics 1 provided as there are playing keys on the manual and as many pneumatics 10 as there are stops on that manual, suffice it to say that when all the stops are drawn the contacts 12 are positioned in such manner that a given playing key on the manual, establishes, through its contact bar 4, circuits for sounding corresponding pipes in each series or stop and when only a portion are drawn only the pipes in those series are affected.

The bellows 1 for operating the contact bars 4 from the keys are preferably arranged in two rows at the opposite ends of the row of slide bars 8, one row extending along each side rail of the guide frame or longitudinally of the slide bars. Contiguous bellows in each row are arranged to respectively operate contact bars lying on opposite sides of an intermediate contact bar. The latter, though perhaps in alinement with one of such bars is operated by a bellows in the other row that is offset therefrom but opposite its crank arm 6 and in this way compactness is obtained in the arrangement of the parts and the contact bars 4 (which, in themselves, require very little spacing) may be arranged relatively close together in proportion to the size of their operating bellows 1.

I claim as my invention:

1. In electrically operated musical instruments, the combination with a pivoted bar forming an electrical contact extending substantially parallel with its axis of movement, means for swinging it in a given path and a playing key controlling said means, of a stop mechanism embodying a movable member having a contact movable therewith into the path of the first mentioned contact, a stop key controlling said movable member, a playing circuit including the contacts and a sound-producing unit of the instrument having operating means arranged in said circuit.

2. In electrically operated musical instruments, the combination with a pivoted bar forming an electrical contact extending substantially parallel with its axis of movement, of a crank arm connected thereto, a bellows for operating the crank arm to rotate the contact in a given path, means embodying and under the control of a playing key for controlling the bellows, and a stop mechanism embodying a stop key and a movable member controlled thereby having a contact movable with the member into the path of the first mentioned contact, a playing circuit including the contacts and a sound-producing element of the instrument having operating means arranged in said circuit.

3. In electrically operated musical instruments, the combination with an electrical contact member, means for moving it in a given path and a playing key controlling said means, of a stop mechanism embodying a guide, a longitudinally movable slide bar operating therein, an electrical contact on the slide bar movable therewith into the path of the first mentioned contact, a stop key controlling the slide bar and a playing circuit including the contacts and a sound-producing element of the instrument having operating means arranged in said circuit.

4. In musical instruments, the combination with a pivoted bar forming an electrical contact extending substantially parallel with its axis of movement, means for rotating it in a given path and a playing key controlling said means, of a stop mechanism embodying a guide, a longitudinally movable slide bar operating therein transversely of the pivoted bar, an electrical contact on the slide bar movable therewith into the path of the first-mentioned contact and formed by a resilient post extending transversely of the pivoted bar, a stop key controlling the slide bar, a playing circuit in-

cluding the contacts and a sound-producing element of the instrument having operating means arranged in said circuits.

5. In electrically operated musical instruments, the combination with an electrical contact member, means for moving it in a given path and a playing key controlling said means, of a stop-mechanism embodying a guide, a longitudinally movable slide bar operating therein, an electrical contact on the slide bar movable therewith into and out of the path of the first-mentioned contact, a bellows at one end of the guide coöperating with the adjacent end of the bar to move it in one direction, a stop key controlling the bellows, a spring at the other end of the guide coöperating with the opposite end of the bar to return the same, a playing circuit including the contacts and a sound producing element of the instrument having operating means arranged in said circuit.

6. In electrically operated musical instruments, the combination with guides and a plurality of longitudinally movable slide bars operating therein, of a pivoted yoke-shaped contact member mounted to extend transversely across all the bars and to swing in a given path longitudinally thereof, a playing key controlling the yoke shaped member, a contact member projecting from each bar and movable therewith into the path of the first-mentioned contact member, a stop key controlling each slide bar, a plurality of playing circuits each including the yoke shaped member and one of the contacts on the slide bars, and a sound producing element of the instrument having operating means arranged in each circuit.

7. In a stop mechanism for electrically operated musical instruments, the combination with a plurality of longitudinally movable slide bars arranged side by side in a row, of a plurality of parallel contact members extending transversely across said bars and arranged to move each in a given path longitudinally thereof, a plurality of contact members on each slide bar movable therewith into and out of the paths of the first mentioned contact members, respectively, stops controlling the slide bars, a plurality of circuits each including a contact on one bar and one of the first-mentioned contact members, a plurality of sound producing elements each having operating means in one of said circuits, two rows of bellows, said rows being disposed longitudinally of the slide bars at each end of the row of slide bars, each bellows being arranged to operate one of the contact members, and a playing key controlling each bellows, adjacent contact members being operated by bellows respectively arranged, one in each row of bellows.

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Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."