(No Model.) 3 Sheets—Sheet 1.

E. S. VOTEY, W. B. FLEMING & W. D. WOOD.

ELECTRIC KEY ACTION FOR PIPE ORGANS.

No. 547,568. Patented Oct. 8, 1895.

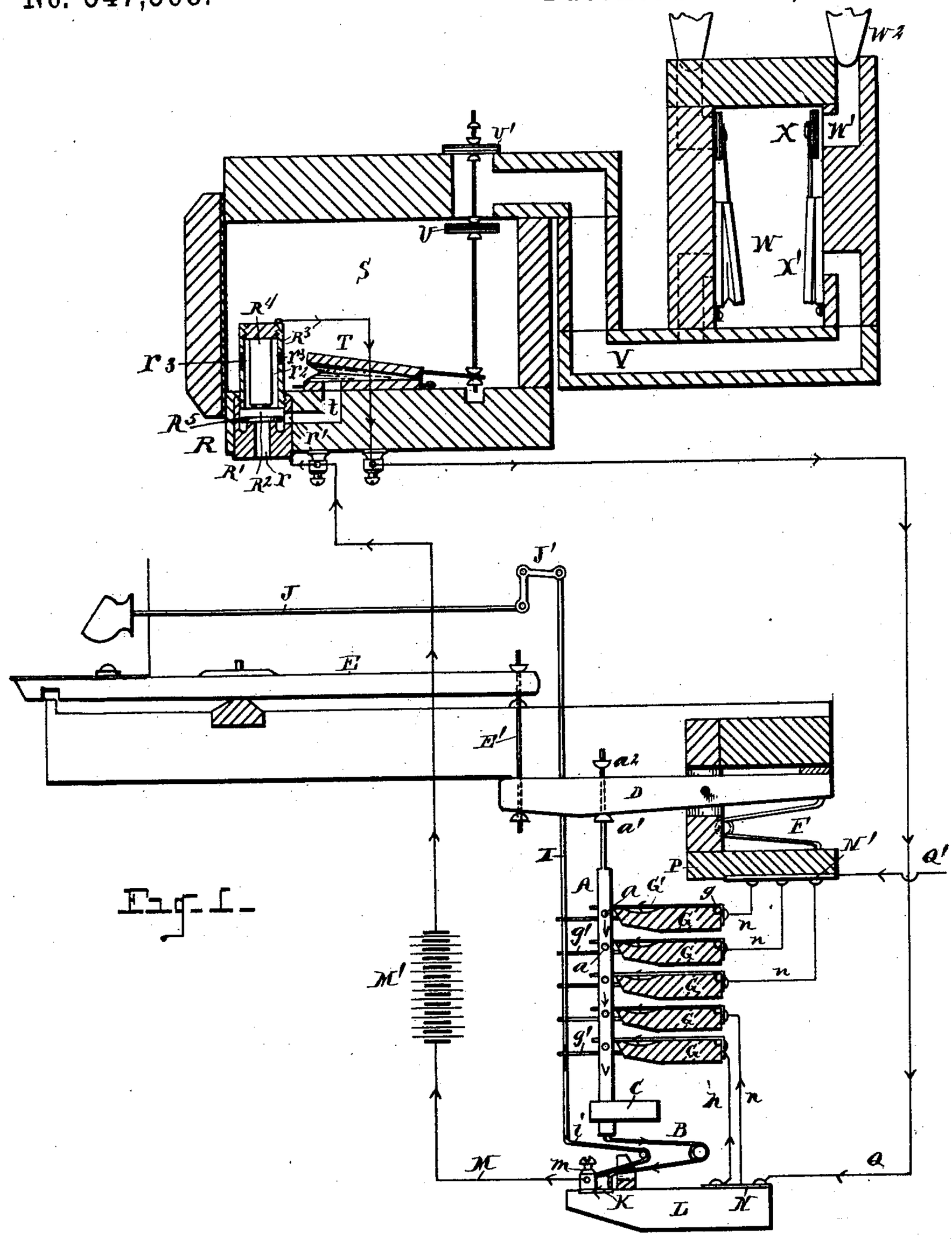

Fig. 1.

WITNESSES

Otto B. Baumgras.

W. A. Martin.

Edwin S. Votey
William B. Fleming
William D. Wood
INVENTORS

By their Attorney

Merrill S. Wright.

(No Model.) 3 Sheets—Sheet 2.

E. S. VOTEY, W. B. FLEMING & W. D. WOOD.

ELECTRIC KEY ACTION FOR PIPE ORGANS.

No. 547,568. Patented Oct. 8, 1895.

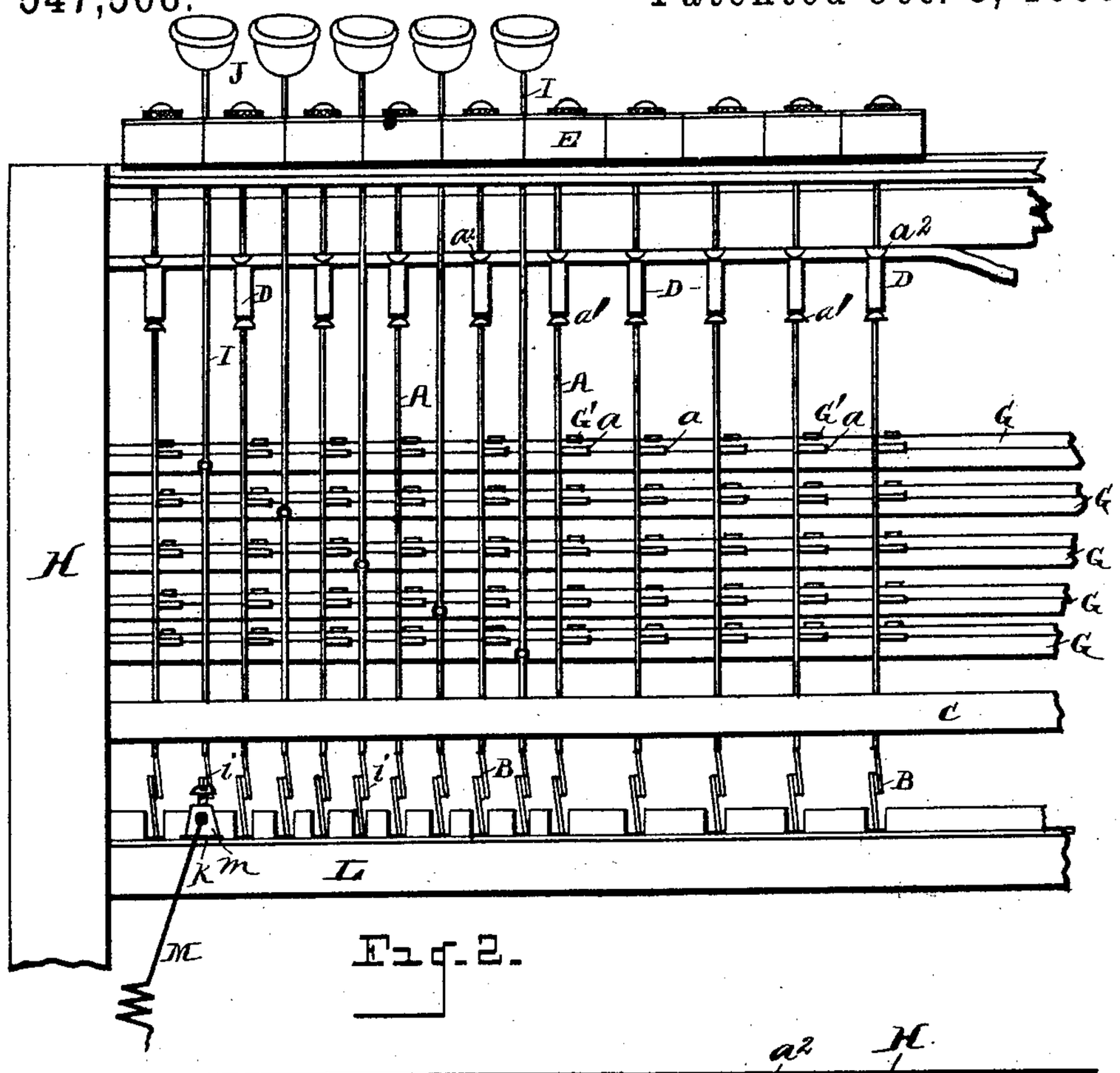

Fig. 2.

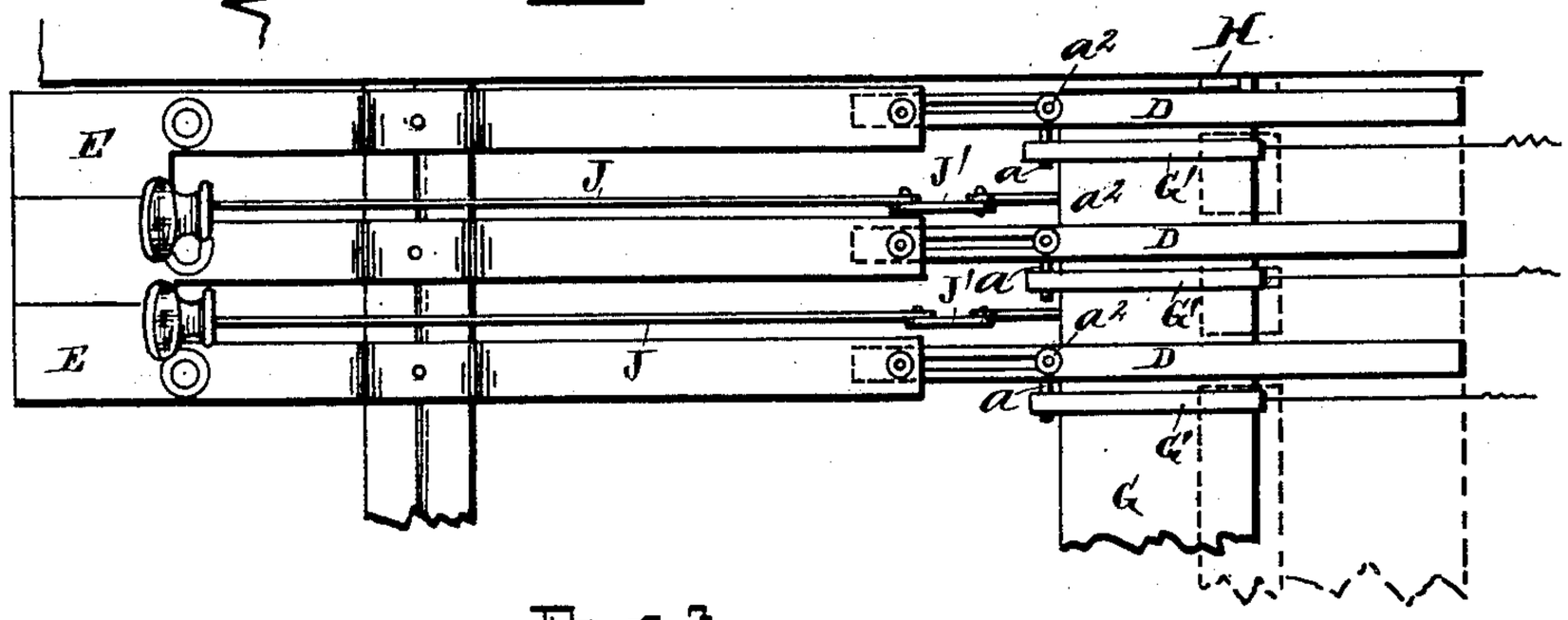

Fig. 3.

WITNESSES

Otto B. Baenziger.

W. A. Martin.

Edwin S. Votey INVENTORS
William B. Fleming
William D. Wood
By their Attorney
Newell S. Wright

(No Model.) 3 Sheets—Sheet 3.

E. S. VOTEY, W. B. FLEMING & W. D. WOOD.

ELECTRIC KEY ACTION FOR PIPE ORGANS.

No. 547,568. Patented Oct. 8, 1895.

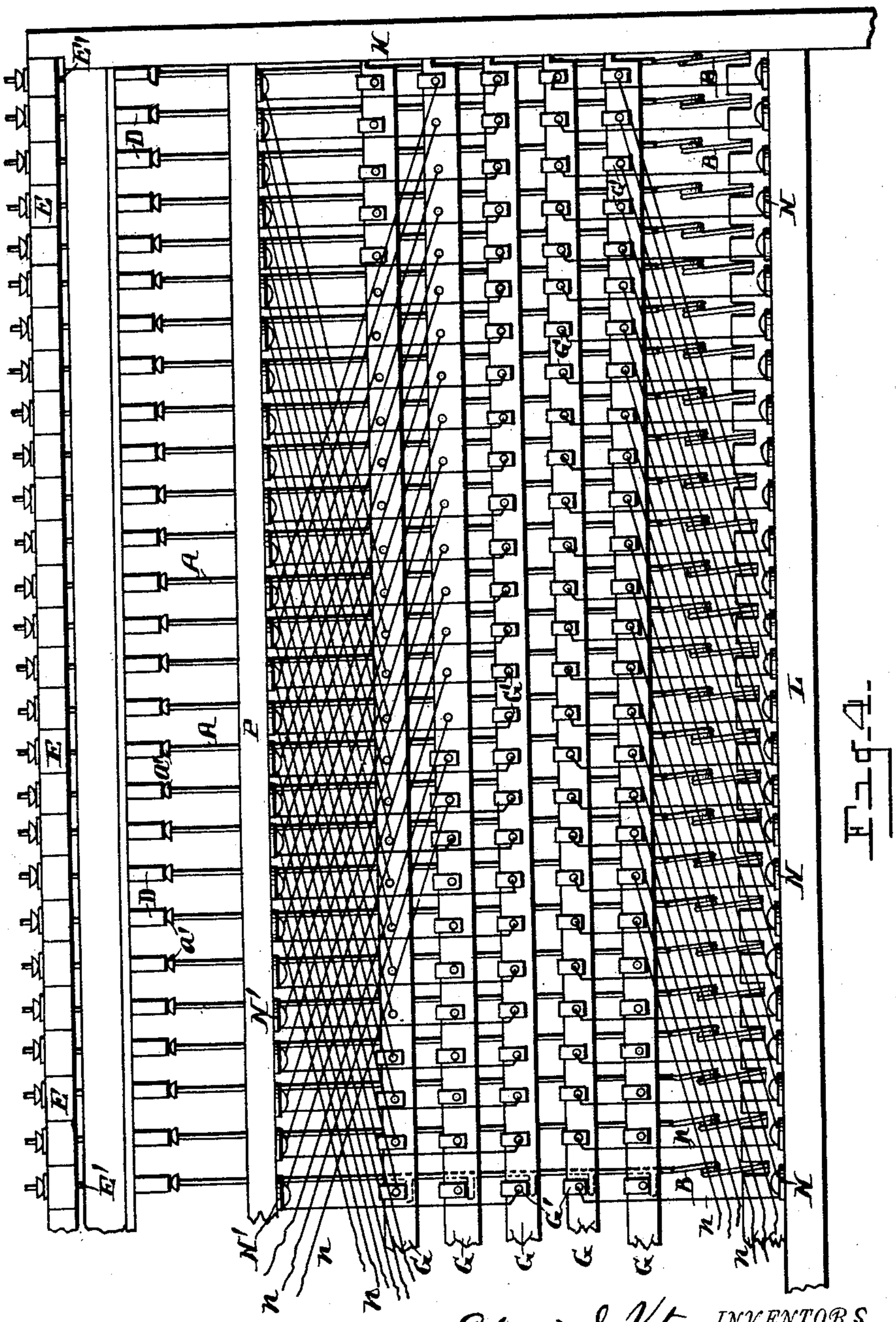

Fig. 4.

WITNESSES

Otto B. Baenziger.

W. A. Martin.

INVENTORS

Edwin S. Votey
William B. Fleming
William D. Wood

By their Attorney

Newell S. Wright

UNITED STATES PATENT OFFICE.

EDWIN S. VOTEY, WILLIAM B. FLEMING, AND WILLIAM D. WOOD, OF DETROIT, MICHIGAN, ASSIGNORS TO THE FARRAND & VOTEY ORGAN COMPANY, OF SAME PLACE.

ELECTRIC KEY-ACTION FOR PIPE-ORGANS.

SPECIFICATION forming part of Letters Patent No. 547,568, dated October 8, 1895.

Application filed January 21, 1895. Serial No. 535,636. (No model.)

To all whom it may concern:

Be it known that we, EDWIN S. VOTEY, WILLIAM B. FLEMING, and WILLIAM D. WOOD, citizens of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Electric Key-Actions for Pipe-Organs; and we declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

Our invention has for its object a novel electric key-action for pipe-organs of superior efficiency and utility; and it consists of the construction, combination, and arrangement of devices hereinafter specified and claimed, and illustrated in the accompanying drawings, in which—

Fig. 1 is a diagram view of portions of a pipe-organ mechanism, showing parts in section and parts in elevation. Fig. 2 is a view in front elevation, showing the case in section. Fig. 3 is a partial plan view. Fig. 4 is a view in rear elevation, certain parts being omitted to avoid confusion in the drawings.

We carry out our invention as follows:

A denotes a series of vertical coupler-bars, there being preferably as many of these coupler-bars as there are keys in the organ. These coupler-bars are each provided with a series of metallic spurs or lateral projecting-pins *a*. These coupler-bars are each supported upon a spring B, their lower ends being extended through a guide-bar C. The upper ends of said coupler-bars are passed through a series of levers D, the bars each being provided with a nut a' underneath the lever and with a nut a^2 above the lever. These nuts a' a^2 may be of leather or other suitable material and are so adjusted as to permit a free movement of the lever therebetween, as shown.

E denotes the organ-keys connected, as by a rod E′, with the forward end of the lever D.

F is a spring bearing upon the rear end of the lever D therebeneath. As so constructed, it will be evident when the key E is depressed the forward end of the lever D is lifted, permitting the spring B to lift the coupler-bar A. It will be perceived that the coupler-bar A being thus lifted by the spring B instead of by the action of the lever D gives a readier and easier key-action, inasmuch as the depression of the key serves simply to relieve the weight of the lever D from the corresponding coupler-bar A, the spring B then lifting the coupler-bar. At the rear of the series of coupler-bars A are located a series of transverse connection-plates G, of any desired number. These plates are pivotally or jointedly supported at their rear ends in any suitable manner in the organ-case H, *g* denoting the pivot-pins, the same being indicated in Fig. 1, whereby the forward edges of said plates are free to oscillate a desired distance. Each of these connection-plates G is provided with a series of metal contact-bars G′, projecting forward of the plate, as indicated in Fig. 1, to contact with the pins *a* of the coupler-bars, when desired, the rear ends of said contact-plates G′ preferably extending over the rear edge of the corresponding connection-plate, as indicated in Figs. 1 and 4. With each of the connection-plates G is engaged a rod I. For this purpose each of said plates may be provided with a rod g', connecting the plate with the rod I. J is a stop-rod connected with the rod I by means of a bell-crank J′. The lower end of the rod I is supported upon a spring *i*. It will be evident that the spring *i* supports the rod I normally in an elevated position, and consequently holds the contact-bars G′ of the plates G normally above and out of the way of any contact of the pins *a* therewith when the corresponding key is operated, so that when the stop-rod is in no electrical contact can be formed between the coupler-bars A and the connecting-bars G′. When, however, such contact is desired to be made, the stop-rod is thrown out, by which it will be evident its corresponding rod I is depressed, thereby dropping the plate G correspondingly, so that upon the manipulation of a given key the corresponding coupler-bar A, with its pins *a*, will be brought into contact with the bar G′. The springs B are in electrical contact with a junction-plate K on a

cross-bar L, a conductor M being also in electrical connection with said junction-plate, as through a binding-post *m*.

N indicates a series of additional junction-plates upon the strip L, an electrical conductor *n* connecting the junction-plate N with each of the contact-bars G'. Instead of connecting all the conductors *n* to a junction-plate M upon a strip L a portion of said conductors *n* may be led to a junction-plate N' upon a cross-piece P of the organ framework or case. The action, however, is the same; but for greater convenience of arrangement some of the conductors *n* may be led upward and others be led downward to suitable junction-plates.

Q is an electrical conductor in connection with the junction-plate N, and Q' an electrical conductor in connection with the junction-plate N'.

M' denotes a battery.

The conductors Q Q' may be led, within the scope of our invention, to any desired electrical organ mechanism—as, for example, to an electrical magnet, (shown in Fig. 1 at R.) The particular construction of the magnet shown herewith forms the subject-matter of another application filed of even date herewith, but which for greater clearness of understanding we will here describe, the same consisting, essentially, of a metallic base R', provided with an interior chamber R^2, an exhaust-passage *r*, and a lateral orifice *r'*.

R^3 denotes a metallic tubular shell inclosing an electrically-wound core R^4, spaced therefrom, forming a windway r^2 therebetween, communicating through the shell with a fresh-wind box S, as through one or more orifices r^3.

R^5 is an armature or valve normally seated upon the upper edge of the passage *r*, and when the magnet is in electrical circuit seating on the lower edge of the shell R^3, thereby governing the communications between the interior of the base R' with the windway r^2, the passage *r*, and the orifice *r'*.

T is a pneumatic within the wind-box S, communicating with the interior of the base of the magnet R, as through a channel *t*. This pneumatic is connected with valves U and U', which govern the communication of the wind-box S with an air-passage V.

W is a wind-box communicating with an air-passage W', leading to a corresponding pipe W^2.

X is a valve governing the communication of the wind-box W with the passage W', said valve being controlled by a pneumatic X', into which leads the passage V. We do not, however, limit ourselves to this particular arrangement and mechanism controlled by our electric key-action, as our electric key-action may be applied to other constructions and arrangement of devices. The electrical conductors *n*, connected with the two lower connection-plates G, are shown arranged in pairs. One conductor of each pair is designed to make a straight connection to a corresponding organ mechanism, while the other conductor of each pair we design to connect with the octave mechanism. In the case of the three upper connection-boards G, we have shown the corresponding conductors *n* arranged in triplets, one of said conductors making a straight connection to corresponding mechanism, another of said conductors being connected with octave mechanism above, and the other of said conductors being connected with the octave mechanism below, so that three manuals of the organ may be brought into use thereby, if desired. In this case the three conductors *n* would all lead up to the upper manual of the organ, one connecting straight up, as above described, one connecting the octave above, and the other the octave below. To this end the conductors *n*, leading to the octaves above or below, are preferably arranged at an angle, the same being led off to the left or the right, as the case may be, as indicated in Fig. 4.

The operation of the device will now be understood. The organist by pulling out the desired stop throws into operative position the desired connection-plates G, whereupon, by the action of the keys, corresponding portions of the organ are brought into use, as hereinbefore explained. This arrangement, it is evident, acts as an octave-coupler.

What we claim as our invention is—

1. In an electric key action for pipe organs, the combination of connection plates G, pivotally supported at their ends in the organ case, reciprocatory coupler bars A arranged to form electrical contact with said plates, electrical conductors in connection with said bars and with said plates, and means to open and close the electric circuit through said bars and plates, substantially as set forth.

2. In an electric key action for pipe organs, oscillatory connection plates G provided with conductor bars G', a stop actuated rod I engaged with each of said plates, and key actuated bars A constructed to contact with said conductor bars, substantially as set forth.

3. In an electric key action for pipe organs the combination of connection plates G pivotally supported at their ends in the organ case provided with electrical conductor bars G', key actuated coupler bars A constructed to contact with said conductor bars, and electrical conductors in connection with said coupler bars and said conductor bars, said connection plates normally out of operative position, and stop actuated mechanism to bring said plates into operative position, substantially as set forth.

4. In an electric key action for pipe organs, the combination of oscillatory connection plates G pivotally supported at their ends in the organ case provided with electrical conductors, movable key actuated coupler bars A arranged to contact with the conductors upon said plates, stops connected with said plates to bring them into operative position, and a spring to hold said plates normally out

of operative position, substantially as set forth.

5. In an electric key action for pipe organs, the combination of a series of coupler bars, a spring to support each of said bars, a lever through which each of said bars is sleeved, and a key connected with said lever, the action of the key relieving the pressure of the corresponding lever upon the corresponding coupler bar permitting the spring to raise the coupler bar, substantially as set forth.

6. In an electric key action for pipe organs, the combination of a series of oscillatory connection plates, a rod I connected therewith, a spring to support said rod, and a stop arranged to depress said rod when the stop is pulled out and thereby bring the corresponding plate into operative position, the spring normally supporting the corresponding plate out of operative position, substantially as set forth.

7. In an electric key action for pipe organs, the combination of a series of oscillatory plates provided with a series of electrical conductors projecting forward of the corresponding plate, a series of movable coupler bars provided with laterally extended arms *a* to contact with the conductors upon said plates, a key connected with each of said coupler bars, and a stop connected with each of said plates, said plates normally supported out of operative position, substantially as set forth.

8. In an electric key action for pipe organs, the combination of oscillatory connection plates extended transversely across the organ case and jointedly supported thereon a series of key actuated coupler bars A to contact with said plates, junction plates K, N, electrical conductors connecting said junction plates with said connection plates, electrical conductors in connection with said coupler bars whereby the electrical circuit may be closed and opened between said coupler bars and said connection plates, a key to control the movement of each of the coupler bars, and a stop to control the position of each of the connection plates, substantially as set forth.

9. In an electric key action for pipe organs, the combination of oscillatory stop actuated connection plates G jointedly supported at their ends in said case normally out of operative position, a series of key actuated coupler bars A, an electrical conductor in connection with each of said coupler bars, and a series of electrical conductors connected with said plates, a portion of said latter conductors arranged to make a straight connection with other parts of the organ action, and other of said latter conductors arranged to form an octave coupler, substantially as set forth.

In testimony whereof we sign this specification in the presence of two witnesses.

EDWIN S. VOTEY.
WILLIAM B. FLEMING.
WILLIAM D. WOOD.

Witnesses:
CHAS. L. EMMONS,
LAVERNE M. IDE.