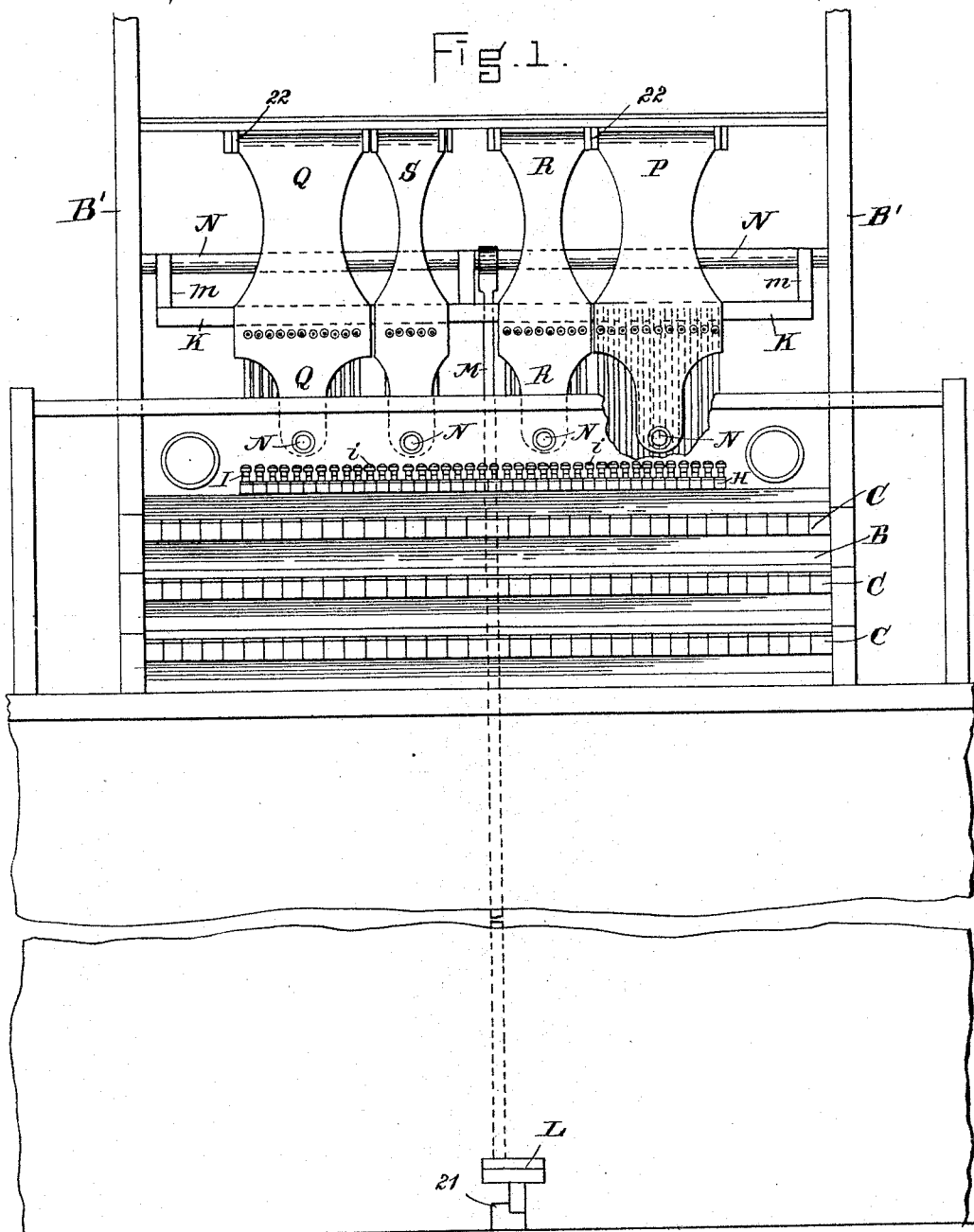


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PIPE ORGAN STOP ACTION.

No. 489,887.

Patented Jan. 10, 1893.



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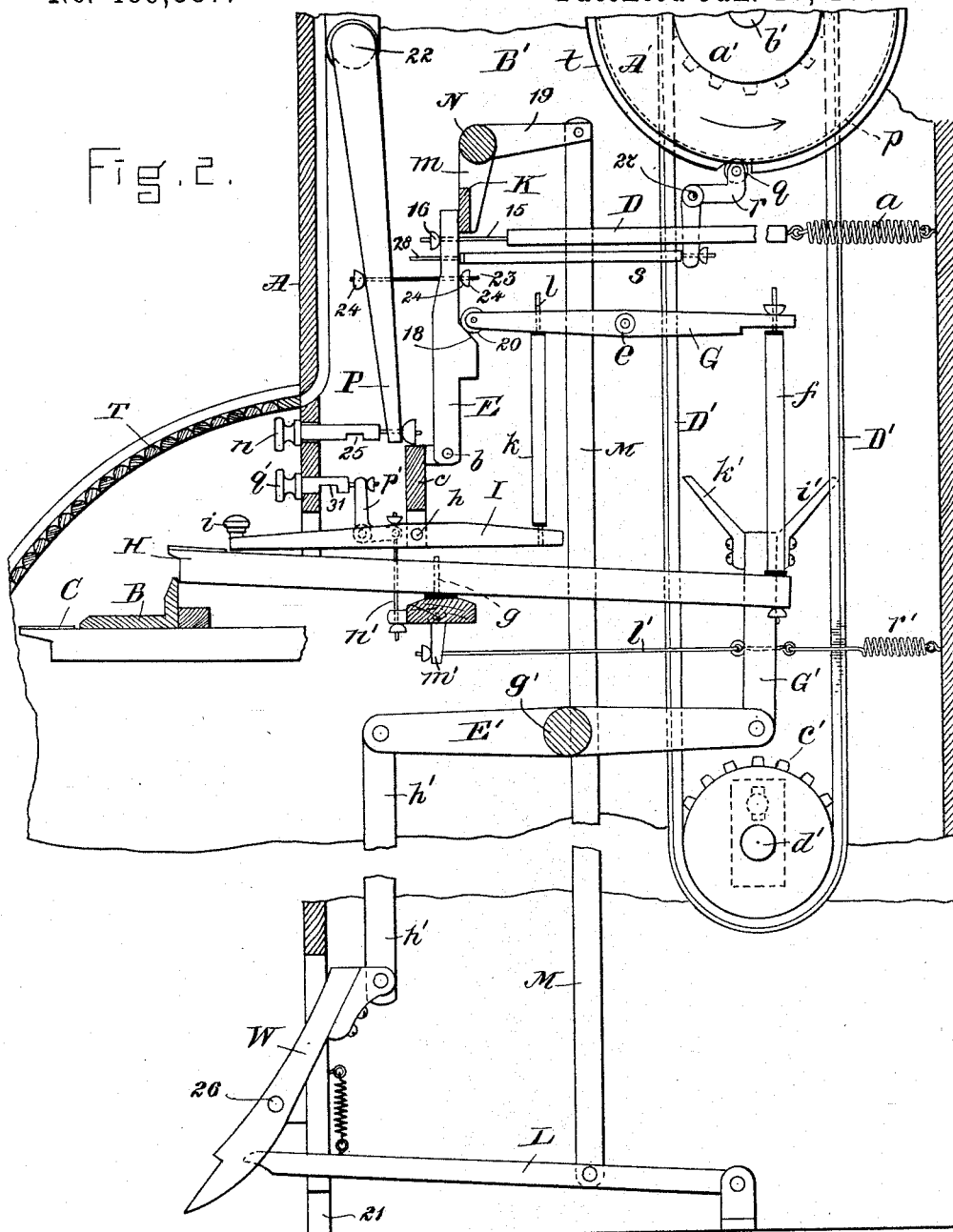
INVENTOR.

Jesse Woodberry
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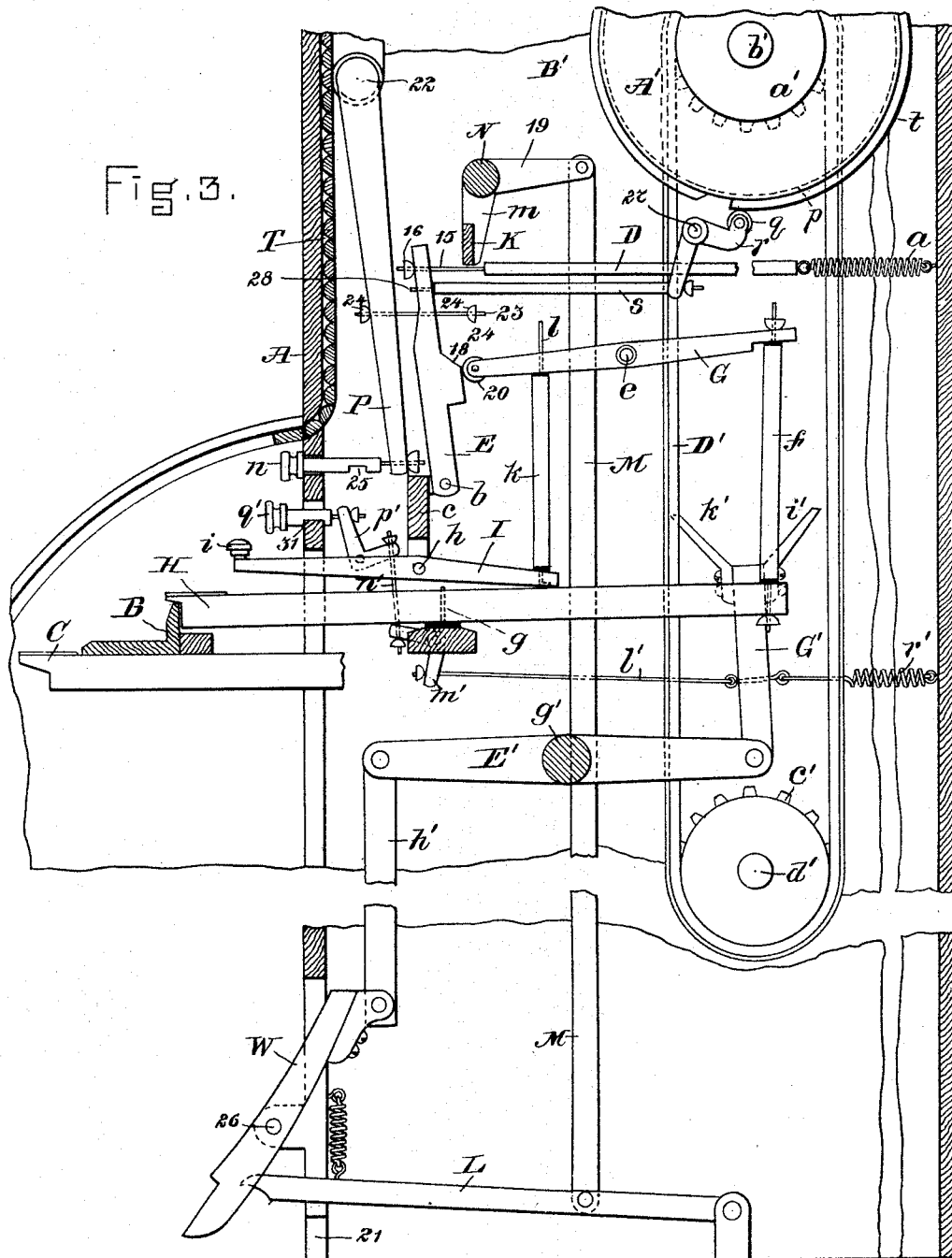
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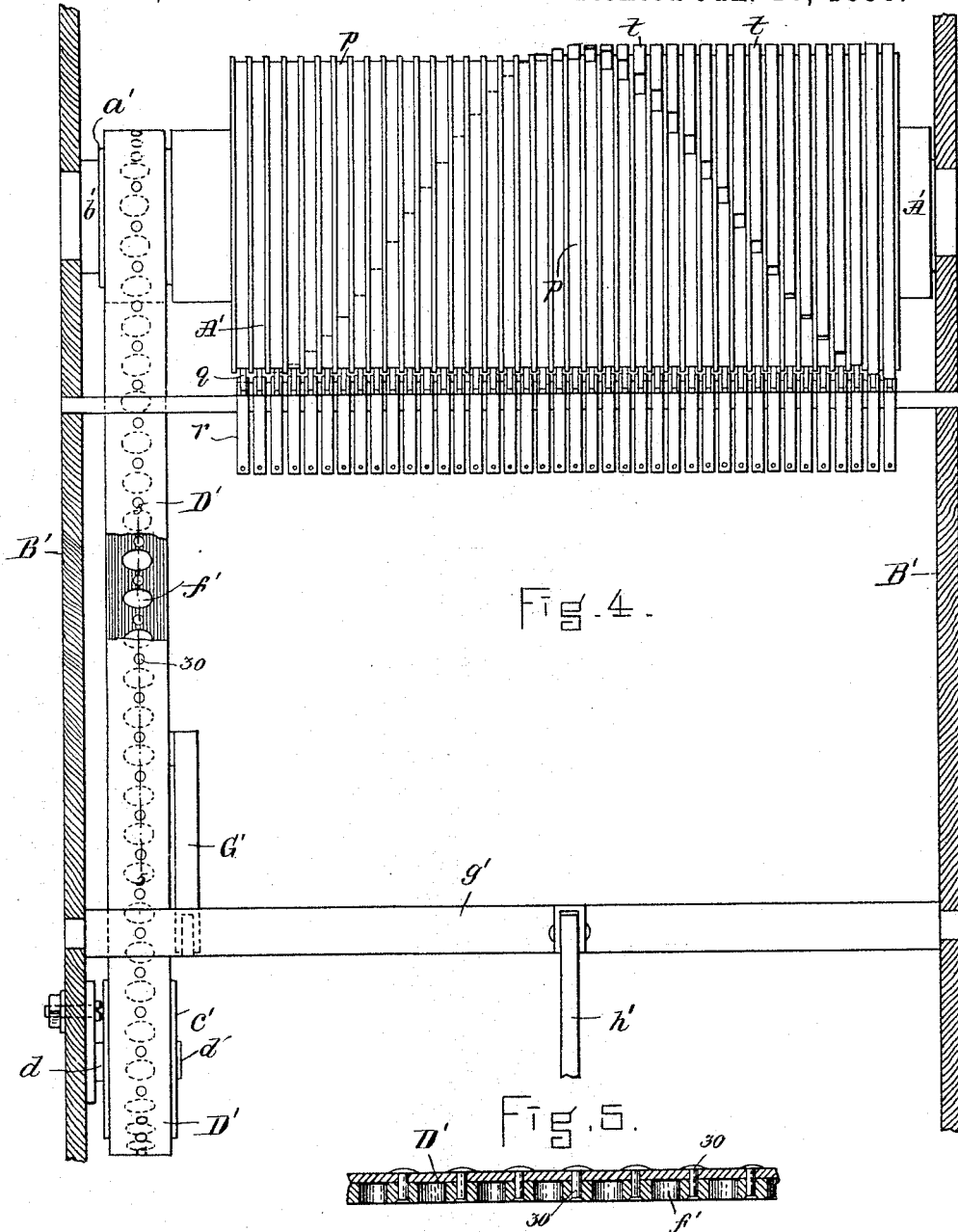
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UNITED STATES PATENT OFFICE.

JESSE WOODBERRY, OF BOSTON, MASSACHUSETTS.

PIPE-ORGAN STOP-ACTION.

SPECIFICATION forming part of Letters Patent No. 489,887, dated January 10, 1893.

Application filed October 1, 1892. Serial No. 447,565. (No model.)

To all whom it may concern:

Be it known that I, JESSE WOODBERRY, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Pipe-Organ Stop-Actions, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is an elevation of a portion of the front of an organ, the upper part being broken away to show a portion of the mechanism behind the same. Fig. 2 is a sectional elevation of my stop-action. Fig. 3 is a similar elevation showing the parts in a different position. Fig. 4 is a front elevation of the crescendo pedal cam-cylinder and its driving belt. Fig. 5 is an enlarged vertical section on the line 5 5 of Fig. 4.

My invention relates to pipe-organ stop actions, in which the stops are operated by key levers instead of by means of draw knobs or handles, and my invention consists in certain novel combinations of parts and details of construction as hereinafter set forth and specifically claimed.

In the said drawings, A represents the front of a pipe-organ, B the key-board, and C the keys.

D are the register rods or stop-bars which control the stop-action, said rods being connected as usual to the slides or valves which are not shown in the drawings as they are of ordinary and well known construction, and form no part of my present invention. The register rods D are arranged parallel to each other and in the same horizontal plane, and each rod is provided with a retracting spring *a*, and is loosely connected by means of a screw wire 15 and nut 16 with the upper end of a lever E pivoted at its lower end at *b* to a longitudinal supporting rail or bar *c*, the wire 15 being free to slide through an aperture in the lever as far as permitted by the nut 16 and the end of the stop-bar D. The lever E is provided with an incline 18, against which bears an anti-friction roll 20, at one end of a rocker arm or lever G fulcrumed at *e*, the opposite end of said lever being connected by a sticker-rod *f* with a key-lever H fulcrumed at *g*. At the end of each lever H is to be in-

scribed the name of the stop with which it is connected, and said levers project through the front of the organ and are located in a convenient position above the upper row of keys C. When a stop is to be "thrown on" its lever H is depressed, which movement causes the lever G to be tilted downward at its front end, causing its roll 20 to act upon the incline 18 and thus force the lever E into the position shown in Fig. 3, which will draw forward the register-rod connected therewith, thus "throwing on" its stop as desired.

Each key-lever H is provided with a tripper lever I, arranged directly thereover and fulcrumed at *h* to the rail *c*. The front ends of the tripper levers I are provided with finger knobs *i*, and the rear or inner end of each lever I supports a vertical sticker-rod *k*, the upper end of which bears on the underside of the rocker lever G in front of its fulcrum, being kept in line with said lever by a guide-wire *l* passing loosely through an aperture in said lever; thus when it is desired to "take off" a stop after it has been "thrown on" by depressing its key-lever H, it is merely necessary to press down the tripper lever I thereover with the finger, when the upper end of the sticker-rod *k* will raise the front end of the lever G and cause its roll 20 to ascend the incline 18 of the lever E into the position shown in Fig. 2, thus permitting the register-rod D to be retracted by its spring *a* to take off the stop connected therewith. As the front end of the lever G is raised, its rear end will force down the sticker-rod *f*, and thus return the key-lever H to its normal position, shown in Fig. 2, while when the lever H is depressed as seen in Fig. 3 to throw on a stop, it will raise the tripper lever into a position ready to release the key-lever when it is required to again throw off the stop.

L is the "full organ" pedal, by means of which all the stops in the instrument may be thrown on simultaneously. This pedal is connected by a rod M with an arm 19 projecting from a roller N, the latter extending entirely across the key board, and carrying arms *m*, upon which is secured a long wooden bar K arranged behind the upper ends of the entire series of levers E and adapted, when the pedal L is depressed, to be brought into contact with said levers E to force the same for-

ward against the influence of the register-rod retracting-springs *a*, and thus simultaneously throw on all of the stops as desired, the pedal L being retained in its depressed position by a notch 21. When the pedal L is released, the springs *a*, will simultaneously take off all the stops at a single movement and also return the levers E, pedal L, and parts connected therewith to their original positions; and when said pedal L is released, it will leave undisturbed any stop or combination of stops that may have been thrown on before said pedal was depressed.

P, Q, R, S, are four wide combination levers, which are pivoted at their upper ends at 22 to suitable supports within the organ casing, each lever having connected with its lower end a pull-knob *n*, by which it may be drawn forward when required. Certain combinations of "speaking stops" are connected with said levers P, Q, R, S, by means of screw wires 23 having nuts 24 at their ends, said wires 23 extending from said levers to the register-rod levers E and passing loosely through the same, whereby the levers E are free to be moved forward separately or individually by their respective key-levers H, or by the "full organ" pedal L independently of said levers P, Q, R, S, while when one of said levers P, Q, R, S, is drawn forward by means of its pull-knob *n*, the particular combination of stops connected therewith will be thrown on simultaneously as required, the shank of the pull-knob *n* being provided with a notch 25, whereby its combination lever may be retained in position when drawn forward against the resistance of the springs *a* of the register-rods D with which it is connected.

The "great organ" stops are connected with the lever P, the "swell organ" stops with the lever Q, the "choir organ" stops with the lever R, and the "pedal organ" stops with the lever S, and consequently any one of these combinations of stops can be thrown on by simply drawing forward the pull knob *n* of the combination lever belonging thereto. The remainder of the stops, which are "mechanical stops" are not connected in groups, but are operated independently when required by their respective key-levers H.

The key board is provided with a flexible cover T similar to that of a roll-top desk.

W is the crescendo pedal, by means of which all of the stops from softest to loudest are successively thrown on, and taken off in reverse order, said pedal being centrally pivoted at 26, and adapted to be rocked or oscillated by the foot placed thereon.

A' is a cam cylinder having its journals suitably supported in the frame or casing B', said cylinder being provided around its periphery from end to end with a series of parallel grooves *p* in each of which runs a roll *q* mounted in the upper arm of a bell-crank *r* fulcrumed at 27, the lower arm of said bell-crank being connected with a horizontal sticker-rod *s*, the opposite end of which is pro-

vided with a wire 28 passing loosely through the upper portion of one of the register-rod levers E, there being one of these rods *s* for each lever E. In line with each of the grooves *p* is a cam *t* extending around that portion of the circumference of the cylinder not occupied by the corresponding groove *p*, said cams being of different lengths the longest extending almost entirely around the cylinder, while the remainder of said cams are made gradually shorter and shorter, whereby as the cylinder A' is rotated, the several rolls *q* will successively ride up in their proper order onto the said progressive cams *t*, which will cause each bell-crank *r* to be rocked in such manner as to push forward its sticker-rod *s* against the end of its lever E and thus force it in the proper direction to actuate the register-rod connected therewith and thus "throw on" that particular stop, while when the cylinder A' is rotated in the opposite direction, the rolls *q* will successively drop off their cams *t* into the grooves *p* in reverse order, and thus permit the levers E to be drawn back by their springs *a*, to "take off" the stops in the reverse order to that in which they were "thrown on."

Any stops that may have been thrown on previous to using the crescendo pedal will remain undisturbed until taken off by releasing their respective key-levers H, as the wires 28 of the sticker-rods *s* are free to slide in the ends of the levers E as previously described.

The cam cylinder A' is rotated in either direction to produce the crescendo effect by means of a driving belt D' passing over a sprocket wheel *a'* on the shaft *b'* of the cylinder A' and a corresponding sprocket wheel *c'* mounted on a stud *d'* projecting from the casing. The belt D' is preferably composed of two thicknesses of leather, the outer one being thin, while the inner one is thick, and is provided with a series of holes forming recesses *f'*, Figs. 4 and 5, with which engage the teeth of the wheels *a'*, *c'*, whereby as the belt is moved in either direction, its motion will be communicated through the wheel *a'* to the cam cylinder A'. The two thicknesses of leather composing the belt D' are glued or cemented together and further secured by rivets 30 placed between the recesses *f'* as shown in Figs. 4 and 5.

E' is a rocker lever fulcrumed at *g'* and having one end connected with the crescendo-pedal W by a vertical rod *h'*. To the opposite end of the lever E' is pivoted an upright bar G' provided at its upper end with two pusher arms *i'*, *k'*, inclined outwardly in opposite directions as shown in Figs. 2 and 3, and adapted, according to the position of the bar G', to successively engage the recesses *f'* on one or the other of the opposite inner sides of the belt D' when said bar G' is moved up and down by the rocking movement of the lever E' produced by oscillating the crescendo pedal W with the foot. By making the driving belt D' of leather, no noise is produced

by its passage over the toothed wheels a' , c' , or the engagement of the arms i' , k' , with the recesses f' of the belt. To the bar G' is secured a rod or wire l' , which is connected with a bell-crank m' , the latter connected by a wire n' with a bell crank p' , the upper arm of which is connected with a draw-pull q' provided with a notch 31, by which it may be held in position when drawn out against the resistance of a retracting spring r' connected with the bar G' . When the draw-pull q' is retracted by the spring r' , as shown in Fig. 2, the arm i' of the bar G' is in a position to successively engage the recesses f' , on the inner side of the rear portion of the belt D' as said bar G' is alternately raised and depressed by the movement of the crescendo pedal W , whereby the belt is moved in the proper direction to rotate the cylinder A' in the direction of the arrow, which will cause the stops to be thrown on successively in any desired order, according to the arrangement of the cams t on the cylinder A' thus producing the desired crescendo effect. After the whole or any portion of the stops have been successively thrown on in this manner, they can be taken off in reverse order by pulling out the draw-knob q' as shown in Fig. 3, which, through the connections described, will draw the bar G' over toward the front and cause its arm k' to engage with the recesses f' on the inner side of the front portion of the belt D' , when as the bar G' is raised and depressed by the movement of the pedal W , the cam cylinder A' will be rotated in a direction contrary to the arrow, (Fig. 2) thus taking off the stops successively as required.

What I claim as my invention and desire to secure by Letters Patent is:—

1. In a pipe-organ stop-action, the combination, with the register or stop-rods and their retracting springs, of the key-levers H , the levers E connected with the register rods and provided with inclines 18, the rocker levers G adapted to act on said inclines to produce a forward movement of the register-rods to throw on the stops, said rocker levers being suitably connected with the key-levers H , and the tripper levers I connected with the rocker-levers G and adapted to actuate the same to release the levers E and take off the stops connected therewith, substantially as described.

2. In a pipe-organ stop-action, the combination, with the register or stop-rods and their retracting springs, of the levers E connected with said register-rods and having the inclines 18, the rocker levers G , each provided at one end with a roll 20 adapted to act on the incline of its lever E to produce a forward movement of the register-rod connected therewith against the influence of its retracting spring, the key-levers H , the tripper levers I arranged thereover, and sticker-rods f , k , extending from the levers H , I , to the rocker-levers G , said rods f , k , being arranged on opposite sides of the fulcrums of

the rocker-levers, whereby as each key-lever is depressed, its tripper lever will be raised, and conversely, substantially as set forth.

3. In a pipe-organ stop-action, the combination of the register-rods and their retracting springs, the levers E connected with the stop-rods by wires 15 and nuts 16, the rocker-levers G , key-levers H , tripper levers I , and suitable connections between said levers H , I , and the rocker levers, G the "full organ" pedal L , rod M , arm 19, roller N , arms m , and bar K , the latter adapted to contact with the upper ends of the entire series of levers E , all constructed to operate substantially as and for the purpose set forth.

4. In a pipe-organ stop-action, the combination of the register-rods and their retracting springs, the levers E connected with said register rods, the key-levers and the tripper levers, the rocker levers G and suitable connections between said rocker arms and the key-levers and tripping levers, and a series of combination-levers provided with draw knobs or operating handles, each combination-lever having independent loose or sliding connections with a portion of said levers E , forming a desired combination of stops, whereby the combination of stops connected with any one of said combination-levers may be simultaneously thrown into or out of action by a movement of said combination lever, substantially as set forth.

5. In a pipe-organ stop-action, the combination, with the register-rods and a cam-cylinder provided with a series of progressive cams adapted, through suitable connections, to actuate said register-rods to throw the stops connected therewith successively into or out of action, of a driving belt passing over supporting wheels or pulleys and adapted to rotate the cam-cylinder, said belt being provided on its inner surface with recesses f' , a vertically reciprocating tilting bar G' provided with outwardly inclined pusher arms i' , k' , adapted to engage the recesses f' on the opposite sides of the belt, the crescendo pedal, and suitable connections between the same and the bar G' , and mechanism connected with a handle or pull-knob for tilting the bar G' to bring either of its arms i' or k' into engagement with the belt, whereby the cam-cylinder can be rotated in either direction by the same movement of the crescendo pedal, substantially as and for the purpose set forth.

6. In a pipe-organ stop-action, the combination of the register-rods and their retracting springs, the levers E connected with said register rods, the cam cylinder A' with its cams t , the bell-cranks r with their rolls q , the sticker-rods s pivoted to the bell-cranks and adapted to actuate the levers E to throw on the stops, the belt D' adapted to rotate the cam-cylinder and provided on its inner surface with recesses f' , the tilting vertically reciprocating bar G' provided with outwardly inclined arms i' , k' , adapted to engage the recesses f'

on opposite sides of the belt, the rocker lever
 E' carrying said tilting bar G', the crescendo
 pedal W connected with said rocker-lever, the
 spring *r'*, the pull-knob or handle *q'*, and
 5 suitable connections between said handle and
 the tilting bar G' whereby the latter can be
 moved to cause either arm *i'* or *k'* to en-
 gage the belt as the bar G' is reciprocated by
 the crescendo pedal, all constructed to oper-

ate substantially in the manner and for the
 purpose set forth.

Witness my hand this 22d day of Septem-
 ber, A. D. 1892.

JESSE WOODBERRY.

In presence of—

P. E. TESCHEMACHER,
 HARRY W. AIKEN.