

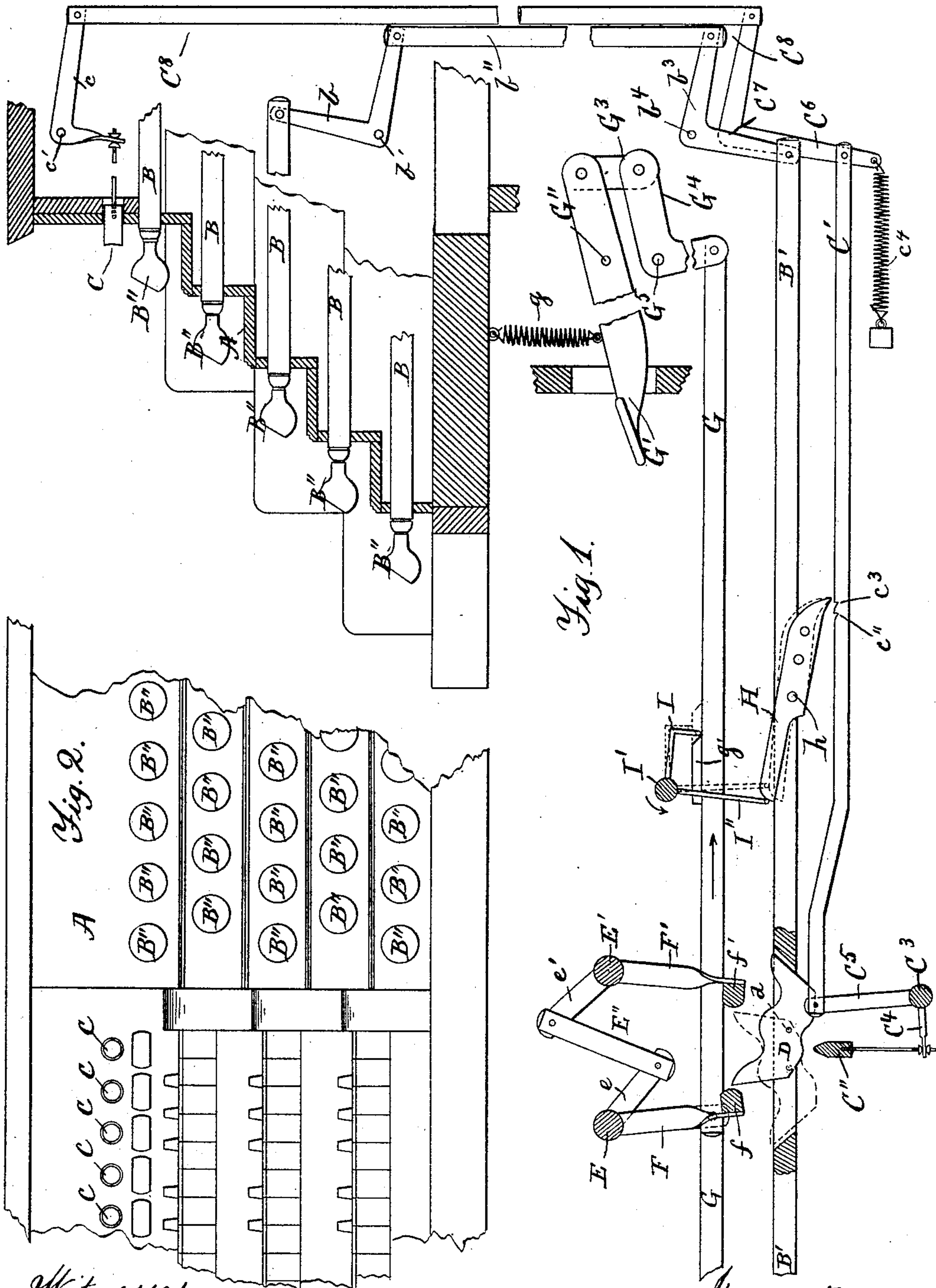
(No Model.)

2 Sheets—Sheet 1.

G. S. HUTCHINGS.
COMBINATION ORGAN STOP ACTION.

No. 451,380.

Patented Apr. 28, 1891.



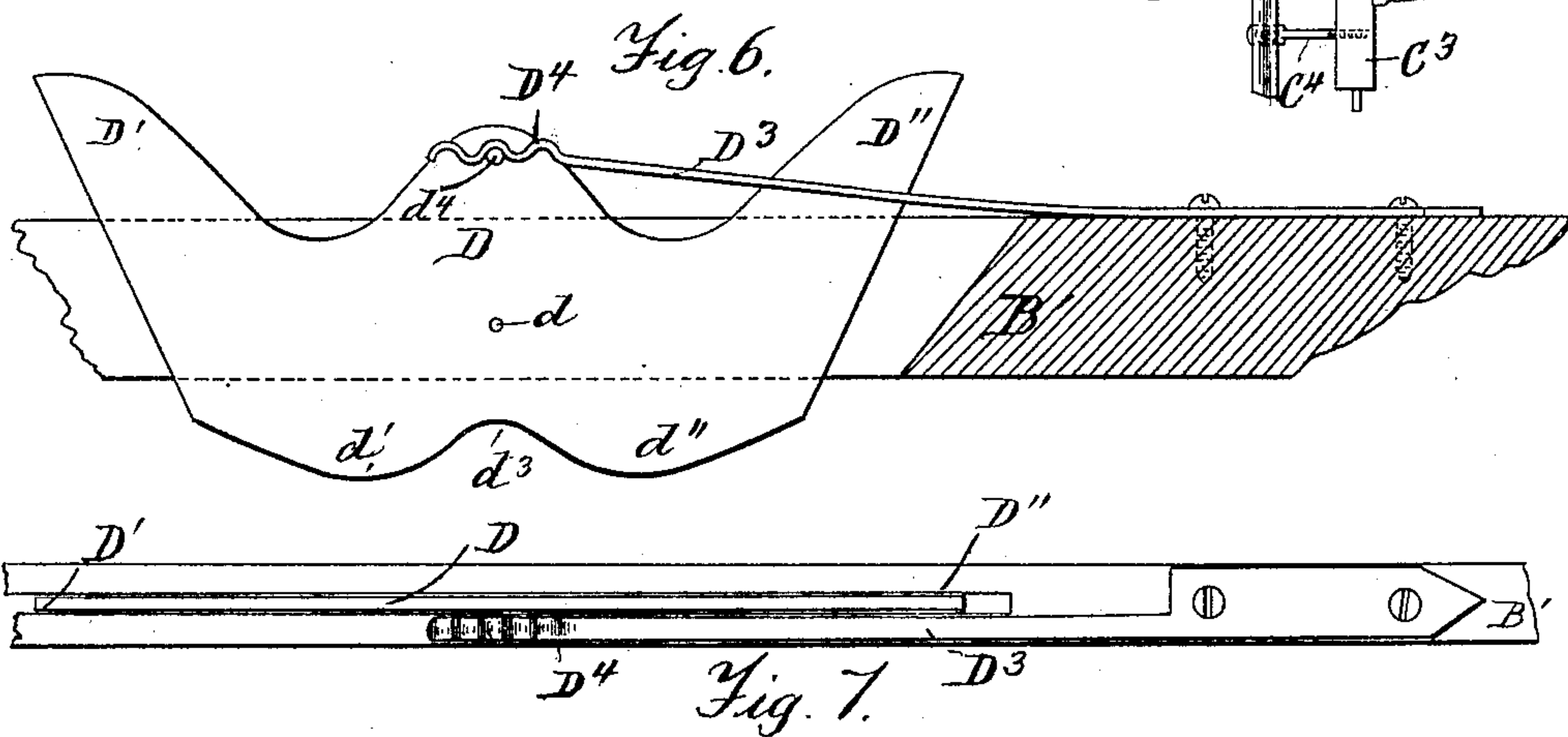
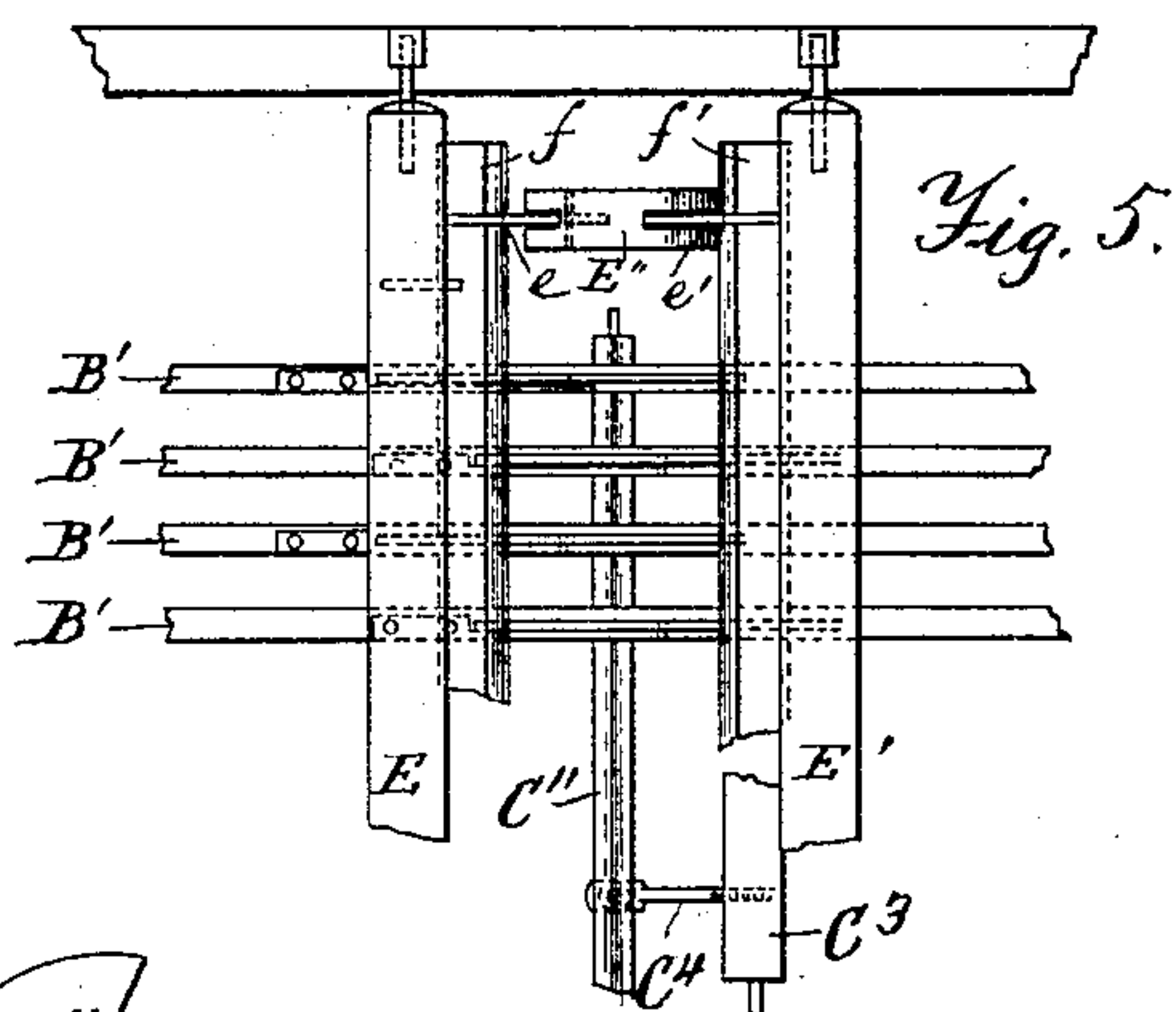
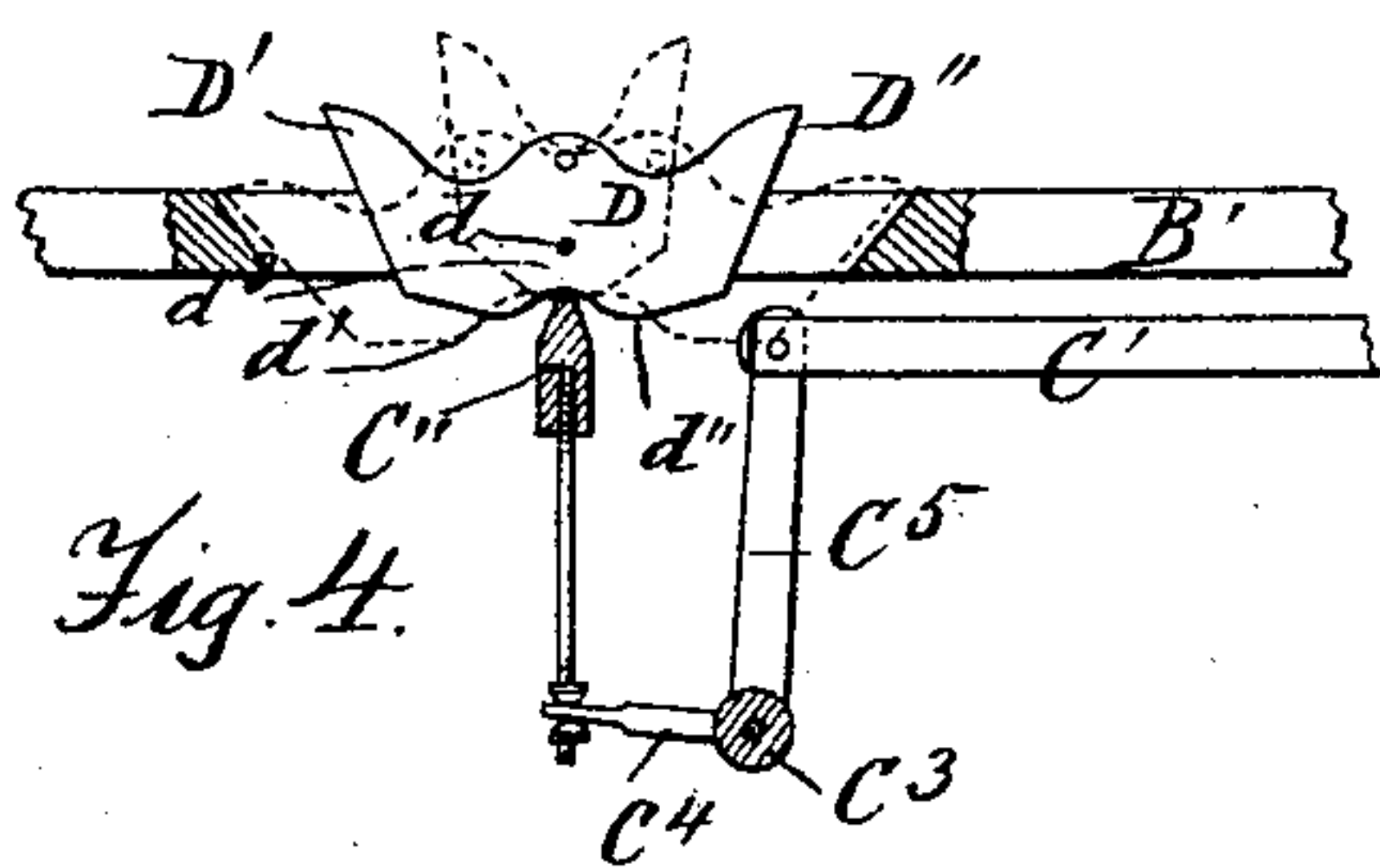
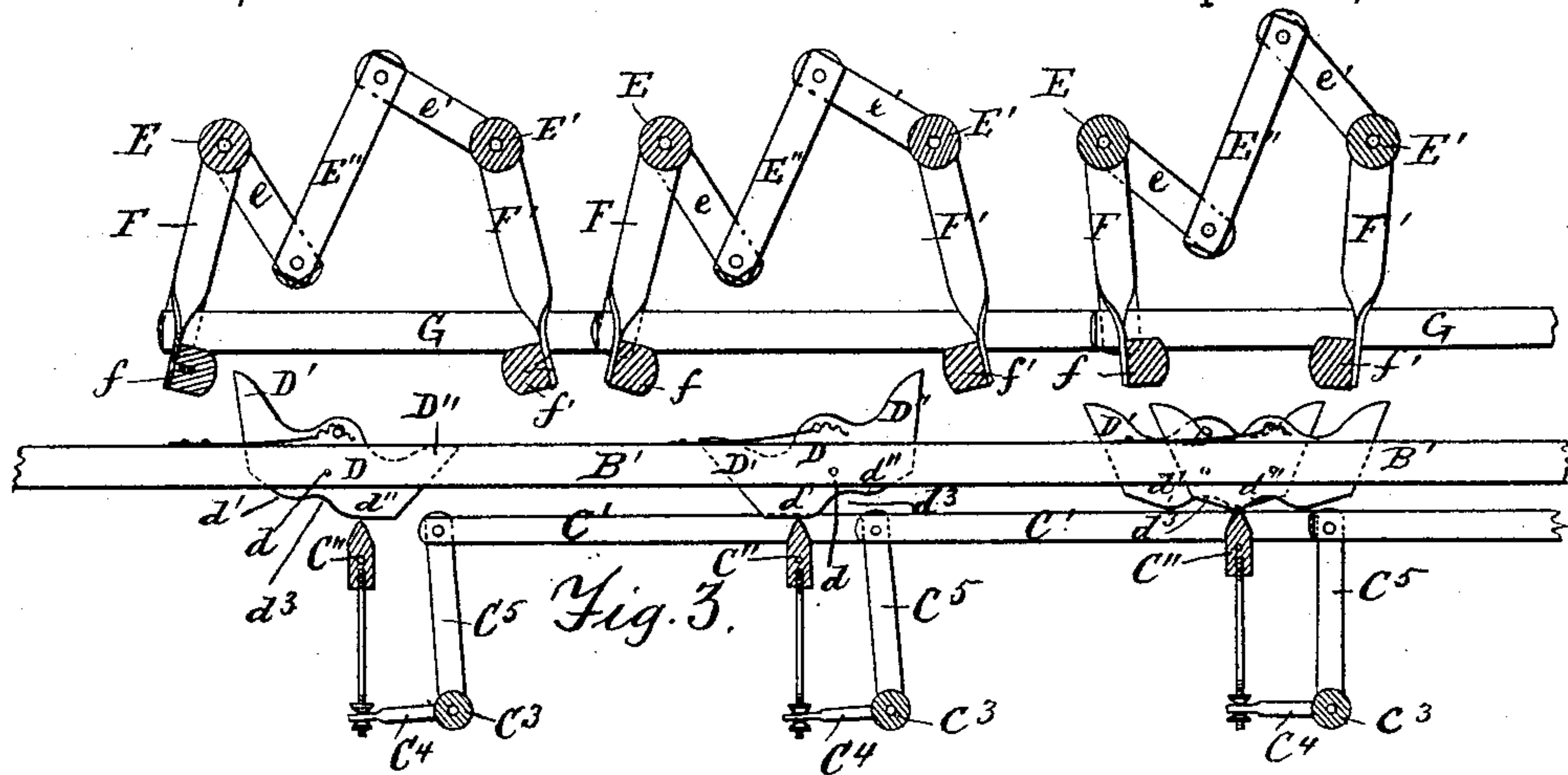
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UNITED STATES PATENT OFFICE.

GEORGE S. HUTCHINGS, OF CAMBRIDGE, MASSACHUSETTS.

COMBINATION ORGAN STOP-ACTION.

SPECIFICATION forming part of Letters Patent No. 451,380, dated April 28, 1891.

Application filed October 13, 1890. Serial No. 367,972. (No model.)

To all whom it may concern:

Be it known that I, GEORGE S. HUTCHINGS, a citizen of the United States, and a resident of Cambridge, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Adjustable Combination-Action for Pipe-Organs, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in adjustable combination-action for pipe-organs for the purpose of enabling the organist to make any combination of stops upon any desired combination-pedal, as hereinafter described and claimed, reference being had to the accompanying drawings, where—

Figure 1 represents a side elevation of the invention, partly shown in section. Fig. 2 represents a partial front elevation of the key-board showing arrangement of the push-buttons. Fig. 3 represents a side elevation of the improved combination-action, showing the register-cams in various positions. Fig. 4 represents a detail side elevation of a register-rod and its connections, showing the tripper-bar raised to its fullest extent preparatory to moving the register-rod for setting the cam thereon. Fig. 5 represents a plan view of the registers and combination-action. Fig. 6 represents an enlarged detail view of a register-rod and its cam, and Fig. 7 represents a top view of the same.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

In Figs. 1 and 2, A represents the key-board of a pipe-organ, as usual, having registers B'' B'', and tripper-bar push-buttons C C, for the purpose of actuating the respective register-rods B' and tripper-bar rods C', as will hereinafter be described. Each register B'' is connected to its register-rod by means of a bell-crank lever b, pivoted at b' and having one of its arms connected to the register B and its other arm connected to a link b'', the lower end of which is connected to one arm of a bell-crank lever b³, pivoted at b⁴, and having its other arm connected to the register rod B', as shown in Fig. 1. Each register B has a knob B'' in its forward end, by means of which said register can be operated. Each register-rod is coupled or connected, as usual,

to an ordinary slide on a wind-chest or to the valve of a pneumatic bellows controlling the movement of such slide as is common in pipe-organs, such slides or valves being, however, not represented in the drawings as they are well known in the art to which this invention relates, and form no part of my present invention.

To each register-rod B' is pivoted at d an oscillatory duplex cam D, having end wings D' and D'', as shown in detail in Fig. 6. Said cam has on its under side a central notch or recess d³, and on opposite sides of the same cam-surfaces d' and d'', as shown in said Fig. 6. Said cam is capable of being swung or tripped on its fulcrum d, and is held in any one of its three positions, preferably by means of a spring D³, attached to the register-bar B' and having its notched or corrugated free end D⁴ adapted to lock on a pin or projection d⁴, as shown in Fig. 6.

Below each duplex cam D is located a vertically-adjustable tripper-bar C'', which is connected to its push-button C by any suitable mechanism. In the drawings, Fig. 1, I have shown such intermediate connecting mechanism as consisting of a rock-shaft C³, having an arm or lever C⁴ connected to the tripper-bar C'', and another arm or lever C⁵ connected to the tripper-bar rod C', which latter has its forward end connected to a bell-crank lever C⁶, pivoted at C⁷, and having connected to its other arm a link C⁸, the upper end of which is connected to a bell-crank lever c, pivoted at c', and having its other arm suitably connected to the push-button C, as shown in Fig. 1. A spring c⁴ serves to hold the tripper-bar C'' in its normal released operative position, as shown in Fig. 1.

Above the duplex cam D is located in suitable bearings a pair of lateral rock-shafts E and E', which are coupled together by means of a link E'', pivoted to arms or levers e and e', attached to the respective rock-shafts E and E', as shown in Figs. 1 and 3.

To the rocker-shafts E and E' are secured the downwardly-projecting respective arms or levers F F', having secured to their lower ends, respectively, the rocker-bars f and f', as shown in Figs. 1 and 3. The lever F is connected to a horizontal bar G, which I term the "combination-rod," which rod is operated in

one direction, the one shown by arrow in Fig. 1 by means of a pedal G' , pivoted at G'' , and connected at its rear end by means of a link G^3 to a bell-crank lever G^4 , pivoted at G^5 , and having its other end connected to the rod G , as shown in Fig. 1.

When the pressure on the pedal is released, it and the rod G and the levers $F F'$ are returned to their normal positions, preferably by means of a suitable spring g . (Shown in Fig. 1.) In connection with the tripper-bar C'' , I use a locking device for the purpose of holding said bar in its neutral and actuating positions, which locking device consists of a spring-pressed dog or pawl H , pivoted at h , (not to the register-rod B'), and having its lower end adapted to engage in either one of the notches $c'' c^3$ on the tripper-bar rod C' , as shown in Fig. 1. The said dog is released from engagement with the said notches on the tripper-bar rod C' by means of a projection g' , attached to the combination-rod G , which comes in contact and raises a lever I , attached to a rock-shaft I' , when the rod G is moved in the direction shown by arrow in Fig. 1. The rock-shaft I' has attached to it a lever I'' , which comes in contact with the upper end of the dog H when the shaft I' is rocked in the direction of arrow shown in Fig. 1, thereby causing the said dog to be tripped and its lower end raised out of that one of the notches $c'' c^3$ in which it was for the time being held.

To trip the cam D for the purpose of bringing the stop on, the tripper-bar C'' is raised to its full extent, as shown in Fig. 4, by pressing the button C inward to its full stroke, after which the register-rod B' , connected to the stop desired to be operated, is then moved forward by pulling the register-knob B'' , to which it is connected, causing the cam-surface d' to come in contact with the tripper-bar C'' , by which it is tripped, so that one wing D' will be raised to a position shown in dotted lines in Fig. 4 and in full lines in the left-hand portion of Fig. 3, in which position it will be actuated by the rocker-bar f when its pedal G' is depressed, so that if at any future time the stop should be off it will be brought on by depressing the said pedal and operating the said rocker-bar.

If it is desired to take off any number of the stops at any future time by means of their particular pedal, assuming such stops to be on, the tripper-bar C'' must be raised to its full extent, the stops desired to be taken off pushed in by hand, which causes the cam-surface d'' to come in contact with the said tripper-bar, by which the cam D assumes the position shown in dotted lines in Fig. 1, so that no matter what changes have been made in the position of the stops, they will be taken off by the depression of the pedal causing the rocker-bar f' to come in contact with the raised wing D'' of the cam D .

Should the organist desire to have some stops not operated by the pedal he raises the

tripper-bar C'' to its neutral position (shown in the right-hand end of Fig. 3) and draws or pushes off the register-rods, as the case may require, causing the cams D on such register-rods to be moved to neutral positions shown in full lines in the right-hand end of Figs. 3 and 6, in which position they cannot be actuated by the depression of the pedal. Whenever any pedal-rod G is actuated by the depression of its pedal G' , a rock-lever $I I''$ is operated by the projection g' on such pedal-rod, causing the weighted or spring-pressed dog H to be tripped and released from one of the two notches $c'' c^3$ in the link C' , that operates the tripper-bar C'' , for the purpose of automatically lowering said tripper-bar to enable the register-rods to be operated without their cams coming in contact with said tripper-bar.

By the employment of the oscillating cams, each having a duplex cam-surface, I obtain absolute certainty of operation, which is an advantage over rockers provided with pins, in that where pins are employed failure of operation of some one or more of the registers which it is intended to work frequently occurs. From that fact in operating the pusher on a number of rockers having pins some of the latter frequently cant or tilt, and thereby causes so much friction that the register or stop rods spring sufficiently to allow the pusher to work its full stroke, and therefore the pins protruding but half-way or less through the stop-rod the wipers will move the latter just sufficiently to leave the stops half on or off, as the case may be. By providing duplex cams according to my invention the foregoing objection is entirely avoided, and I am enabled to set each stop individually instead of setting the stops collectively, thereby avoiding much friction. In my invention I avoid a multiplicity of combination-pedals and provide a single pedal which fulfills all the conditions required for an indefinite number of combinations, since the combinations can be quickly and correctly made, even while the organist is performing. Again, while playing upon one manual the performer can press in the push-button C , and then as opportunity presents itself, as when either hand can be spared for an instant, he can draw such stop or stops as he may desire for his next movement, and therefore need give no further attention to the push-button or the pedal, as the first movement of the latter releases the push-button, which immediately resumes its normal position, and the tripper-bar falls out of the way of the cams before the rocker-bar can come in contact with either wing of the cams. This operation is automatically performed by means of the inclined projection g' , coming in contact with and raising the lever I , thus rotating the rocker-shaft I' , and in turn swinging the lever I'' against the raised end of the dog H .

Having thus fully described the nature, con-

struction, and operation of my invention, I wish to secure by Letters Patent, and claim—

1. A combination-action for pipe-organs, consisting of adjustable register-rods, each having an oscillatory cam provided with a duplex cam-surface, adjustable tripper-bars acted directly upon by the cam-surfaces of the cam, rocker-bars directly acting upon opposite ends of the cam, a pedal, and connections for imparting the required movements to the register-rods, substantially as described.

2. A combination-action for pipe-organs, consisting of adjustable register-rods, each having an oscillatory cam provided with a duplex cam-surface, vertically-adjustable tripper-bars acted directly upon by the cam-surfaces of the cam, rocker-bars directly acting upon the opposite ends of the cam, a pedal, connecting mechanism for imparting the requisite movements to the register-rods, and locking and releasing devices movable with the register-rods for locking and releasing the tripper-bars, substantially as described.

3. In an adjustable combination-action for pipe-organs, the combination of a register-rod, an oscillating cam pivoted to the rod and provided with a central notch and duplex cam-surfaces on its under side, with pedal-actuated rocker-bars, and a vertically-adjustable tripper-bar directly acted on by the duplex cam-surface of the cam, substantially as described.

4. The combination, in a pipe-organ, of register-rods, oscillating cams pivoted on the rods and each provided with a duplex cam-surface *d' d''*, adjustable tripper-bars acted directly upon by the cam-surfaces of the cams, and pedal-operated rocker-bars directly acting upon the cam, substantially as described.

5. The combination of a series of register-rods, each having an oscillating cam pivoted thereto and provided with a duplex cam-sur-

face, with a pair of rocker-bars adapted to move simultaneously in opposite directions, a treadle connected with the rocker-bars for operating the same, and means for individually setting the cams, substantially as described.

6. The combination, in a pipe-organ action, of a push-button, a register, a register-rod having an oscillatory cam pivoted thereto and provided with a duplex cam-surface, a tripper-bar rod connected with the push-button, a rock-shaft carrying a vertically-movable tripper-bar and connected with the tripper-bar rod, a combination-rod connected with a treadle and with one of the rocker-bars above the oscillating cam, and a locking device carried by the register-rod, adapted to engage the tripper-bar rod and operated by the combination-rod, substantially as described.

7. The combination, in a pipe-organ action, of a push-button, a register, a register-rod, a tripper-bar rod, pivoted bell-crank levers and links, respectively connecting the push-button and the register with the register-rod and the tripper-bar rod, an oscillatory cam pivoted to the register-rod and provided with a duplex cam-surface, a vertically-movable tripper-bar arranged beneath and acting directly upon the duplex cam-surface of the oscillatory cam, a combination-rod connected with a treadle, rocker-bars located above the oscillatory cam, and a connection between one of the rocker-bars and the combination-rod, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 27th day of September, A. D. 1890.

GEORGE S. HUTCHINGS.

Witnesses:

ALBAN ANDRÈN,
GEO. W. WHITE.