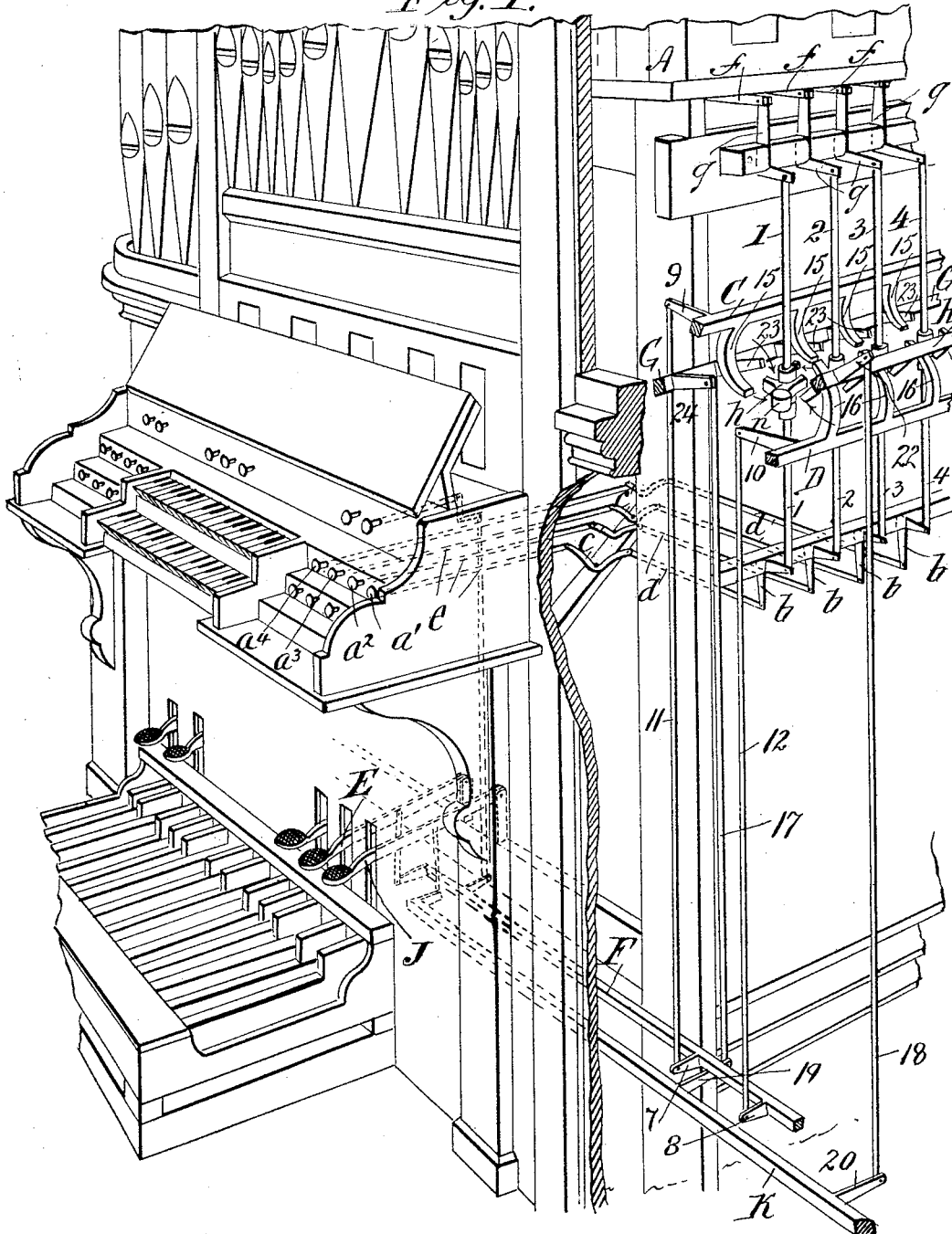


2 Sheets—Sheet 1.

No. 455,365.

Patented July 7, 1891.

Fig. 1.



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J. S. & F. J. STEERE.
COMBINATION ORGAN STOP ACTION.

No. 455,365.

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Fig. 2.

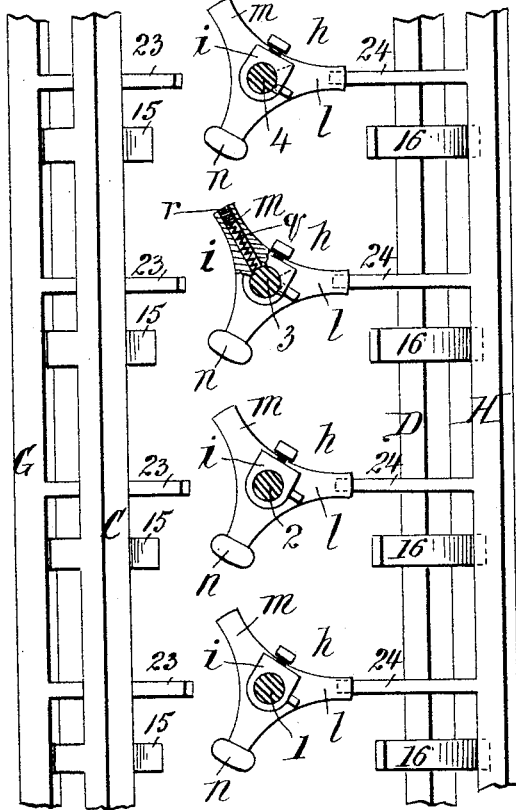
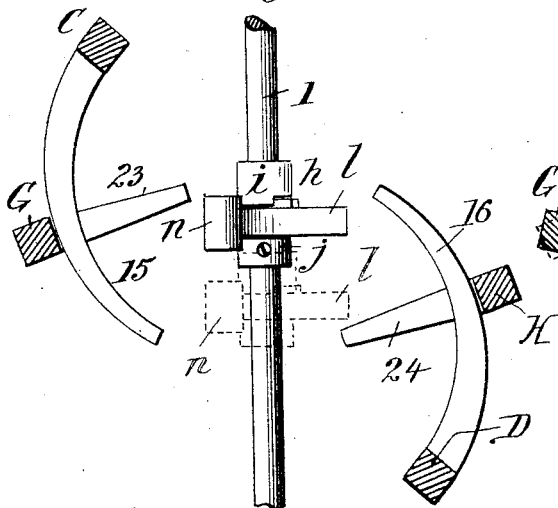


Fig. 3.



Witnesses:
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Fig. 4.

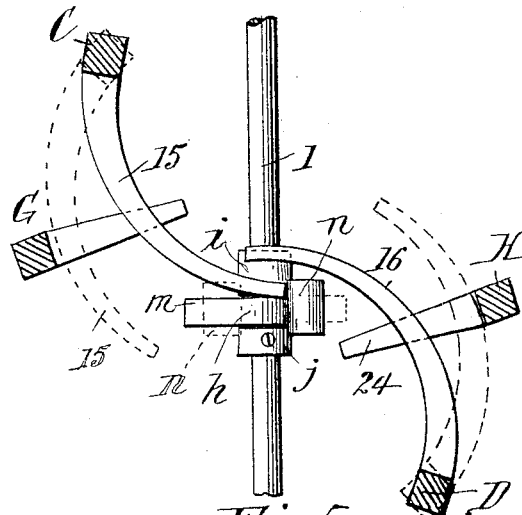


Fig. 5.

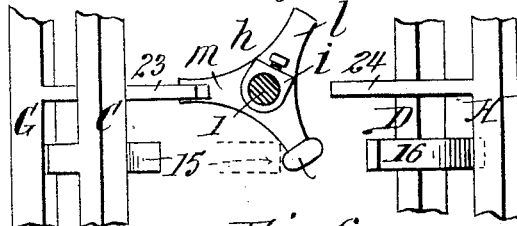
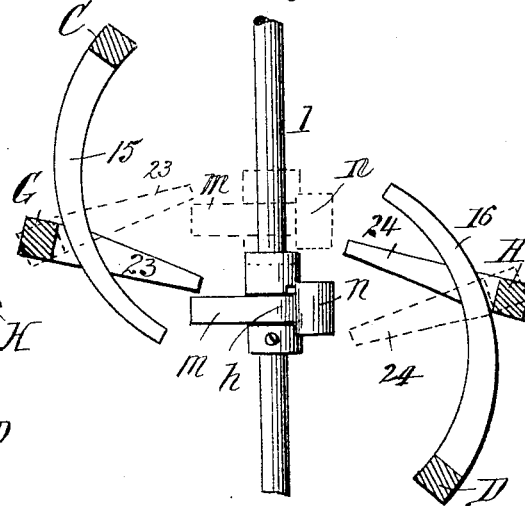


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOHN S. STEERE AND FRANK J. STEERE, OF SPRINGFIELD, MASSACHUSETTS.

COMBINATION ORGAN STOP-ACTION.

SPECIFICATION forming part of Letters Patent No. 455,365, dated July 7, 1891.

Application filed November 15, 1890. Serial No. 371,605. (No model.)

To all whom it may concern:

Be it known that we, JOHN S. STEERE and FRANK J. STEERE, citizens of the United States, both residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Combination Stop-Actions for Organs, of which the following is a specification.

The invention consists in the construction and combination or arrangement of parts, all substantially as will hereinafter more fully appear, and be set forth in the claims.

Reference is to be had to the accompanying drawings, in which the essentials of the invention are shown in a simple and clear manner.

Figure 1 is a view in perspective of the front and side portion of a church-organ with parts broken away to more clearly show the mechanism constituting the invention. Fig. 2 is a horizontal section of a series or part of a series of stop-rods and a plan of operating and controlling devices for working in conjunction therewith. Figs. 3, 4, and 6 are sectional elevation views of single stop-rods and the coacting parts in different relative positions, as will be hereinafter more particularly referred to, Fig. 5 being a plan view of the parts when in their relations indicated by Fig. 6.

In the drawings, 1, 2, 3, and 4 represent rods, here shown as vertically applied and movable and being a few only of a multiplicity thereof, which may be comprised as one or more series or sets in the organ. The said rods have, respectively, provided therefor and for effecting their vertical movement the connections interposed between them and the stops a' , a^2 , a^3 , and a^4 , consisting of the elbow-levers b b and c c and connecting-rods d d and e e , and the slides f at the base of the wind-chest A are respectively operated on the movement of said rods 1, 2, 3, and 4 through the connection therewith of the angular levers g g . As shown, the drawing out of one of the stops a' , a^2 , &c., moves the rod 1 or 2 downwardly, there to remain until the stop-rod is inwardly moved, when the said rod will be restored to its normal position and the respective slide f therefor closed. On each of the rods 1 2 3 4, &c., is a dog h , which is

capable of a partial rotation within given limits on the rod, but is constrained by the fixed collars i and j above and below it from any endwise motion. Each dog has three radially-extended arms l , m , and n .

It is preferred to provide on each dog which is capable of a partial rotation on the stop rod or shaft a friction device whereby there will be no liability from momentum or rebound of the dog assuming a position otherwise than exactly the one desired, and therefore as one manner of constituting the friction device a suitable arm or portion of the dog is radially drilled into its central opening through which the stop-rod passes, within which is placed a spiral spring q , held therein under compression by the stop-pin r , said spring bearing by its inner end with a suitable reaction against the stop-rod.

C and D represent rock bars or shafts which range along and in suitable proximity to the intermediate portions of the said stop-rods being mounted in suitable bearings, whereby they are capable of a free rocking movement, and said rock-bars are both swung through means of the pedal E, linked to an arm on a rock-shaft F, and by the arms 7 and 8 on said rock-shaft being connected through the rods 11 and 12 with the arms 9 and 10 on the said rock-bars C and D. It will be seen that on pressing down the pedal E the said bars C and D will be rocked in opposite directions. The rock-bar C is provided with a series of horns 15 15, which, on the rocking of the shaft C, will be swung alongside and transversely of the stop-rods 1 2 3 4, &c.; but the points or lines traversed by the said horns are not those coincident with the positions normally occupied by the dogs, although in moving the stop-rods into the opening or working position therefor the dog will be carried into such a position that one of the arms—here the one n —will be impinged upon by and at the time of the swinging of a horn 15 opposite thereto and partially rotated—that is, from a position shown in Figs. 2 and 3 to one shown in Figs. 4 and 5. The rock-bar D is provided with a series of horns 16 16, similar to the series 15 and arranged opposite thereto, and as the rock-shaft C swings the oppositely-moving horns 16 on shaft D traverse in lines for an impingement upon the arms n n .

of the dogs only, however, when the stop-rods are in their normal or slide-closing position, and also only for such impingement when the arms *n* are in the shifted positions as caused by the action of the horns 15 on the rock-bar C, as indicated in Figs. 5 and 6.

There are respectively provided alongside of and parallel with the rock-bars C and D two rock-bars G and H, both adapted to be simultaneously rocked in opposite directions through means of mechanism between said rock-bars and a pedal J, said connection mechanism consisting of a rock-bar K, receiving its rocking movement through its radial arm and link connection with said pedal J, and the connecting-rods 17 and 18 between the radial arms 19 and 20 on said rock-shaft K, and the arms 21 and 22 on the pair of rock-shafts G and H. It will be seen that the arms 23 23 on the rock-shaft G swing upwardly as the pedal is depressed, and said arms have such a position relative to the dogs when their arms are swung in their normal or non-working positions, as indicated in Fig. 2, that any swinging of said rock-shaft arms 23 will in no way affect the dogs or the stop-rods; but it will be plain that when the stop-rods are in their normal positions, and the dogs, one or more thereof, are swung around on the shaft, so that their arms *m* are under and in the line of movement of the arms 23 of rock-bar G and said rock-bar is oscillated, such coinciding dogs and the rods on which same are mounted will be depressed and the stop-slides opened. It will be particularly noted, also, that the rock-shaft H is provided with a corresponding and oppositely-disposed series of radial arms 24 24 to the arms 23, which, however, simultaneously swing oppositely to the said arms 23—that is, as the rock-shaft G is moved to swing the arms 23 downwardly the arms 24 on the rock-shaft H rock upwardly. The said arms 24 serve in their upwardly-swinging movements to engage such of the dogs by their arms *l* as may be in their normal positions as to their rotation—that is, as indicated in Fig. 2, and with their respective stop-rods in their depressed or working positions, as indicated in dotted lines in Fig. 3.

The invention will be further and still more clearly understood by setting forth one or two manners of the manipulation of the mechanism for effecting different results. We will first mention that when the stop-rods are closed or up, as in Fig. 3, and the dogs respectively provided therefor are in their normal positions, as in Fig. 2, any movements in one or another direction of the rock-bars C D or G H with the horns or arms thereon will have no effect whatever to change the positions of any of the stop-rods. Of course the stop-rods 1, 2, 3, and 4, &c., may be separately moved to open by drawing on the respective stop-knobs *a'* *a'* *a'*, &c., and after several stop-knobs have been so moved for opening, and it is desired to close them other-

wise than by pushing in the separate and respective stop-knobs therefor, by depressing the pedal J the rock-bar H will be rocked, swinging the arms 24 thereon upwardly, and such of the stop-rods as have been depressed to open, as last above contemplated, will be simultaneously moved to their normal and closing positions; but we will now assume that the organist may desire at some time in the rendering of a musical selection to bring in such an effect as would be produced by the simultaneous opening of the stops controlled by the stop-rods 1, 3, and 4, and yet may previous to the time of bringing in said combination in the playing desire to avail himself of the effect controlled perhaps by the stop-rod 1 or 2 or 3 or any two of such stops. Therefore preparatory to playing, the organist will draw out stop-knobs 1, 3, and 4 to carry the dogs into such a position that the arms *n* thereof will be impinged upon by the respectively opposing horns 15 of the rock-bar C, and he will depress the pedal E, operating said rock-bar C, when the dogs on rods 1, 3, and 4 will be turned around on said rods to occupy the positions indicated in Fig. 5, the arms *m* thereof then lying in the paths of the arms 23 of rock-shaft G. The said stop-knobs for the rods 1, 3, and 4 are then pressed inwardly, the said rods being restored to their normal positions, the relations of the arms *m* of the adjusted dogs with the arms 23 under the last-described stage of the operation being in a manner indicated by the dotted lines at the left of Fig. 6. Now of course at the time of playing the organist can, without any hinderance ensuing from the set of the combination as above, utilize any of the stops, and as many thereof as may be desirable, by working the stop-knobs respectively therefor—such as the ones 1 or 2 or 3, or 1 and 2, or other thereof—but on reaching the period at which the said predetermined combination is to be brought in, the organist has only to depress the pedal E to operate the rock-bar G, and, through the horns thereof engaging with the arms *m* of the dogs on the stop-rods 1, 3, and 4, simultaneously move said rods to open the said stops. Of course this example is of a very simple combination, and in practice it is often intended to prearrange combinations involving a much greater number of stops to be instantaneously operated at the proper period.

On desiring to terminate the effect produced by the combination brought in, as just above explained, the several and separate stops *a'* *a'* *a'*, &c., corresponding to the individual stop-rods of the combination which have been removed to open are forced in by the organist, or a portion of them may be forced in, thereby reducing or modifying that combination, and during the maintenance of said combination the effect may be otherwise modified or augmented by the drawing out of other stops not previously arranged for as a part of the combination.

After a combination has been set, as above explained, and has been made use of and the stop-rods comprised therein have been moved through the separate and respective stops therefor into their closing positions, and it is desired to have the dogs thereon restored to their normal positions within their range of partial rotation, as in Fig. 2, the same is effected by the rocking of the bar D through the pedal E, the horns 16 engaging the arms *n* of the dogs which had been adjusted, swinging said dogs toward the rock-bars C and D and the arms *l* into positions over the rock-bar arms 24.

The devices may be briefly summarized and characterized as follows: The arms *l* of the dogs when in their normal positions as to their rotation serve as abutment-extensions of the stop-rods to be engaged when the stop-rods are open by the rock-bar arms 24 for the moving of said stop-rods to close. The arms *n* of the dogs constitute abutment-extensions on the stop-rods, whereby, through the proper movements of the stop-rods to bring said arms *n* in the paths of the rock-bar horns 15, the dogs of the selected stop-rods may be switched or adjusted, so as to bring other portions of the dogs into coincidence or alignment with the movements of the rock-bar arms 23, and the said arms *m* serve as variable or adjustable abutment-extensions controlled in the manner just stated for securing through the movement of a common pedal-operated rock-bar with the arms 23 thereon the lifting of said arms *m*, and with them as an integral part the stop-rods of which they are adjuncts, and the horns of the rock-bar D may be said to serve as "restoring devices" to carry the dogs which had been set or adjusted to their normal positions as to rotation after the use of the combination and while the stop-rods and dogs are in their normal positions within their range of endwise movement.

One peculiarity of this invention is that, although the dogs on several of the stop-rods may be turned out of their normal positions, having been used in a previous combination, at the time of switching or adjusting dogs or depressed rods for a newly-selected combination, the horns 16 on rock-bar D, moving in a direction oppositely from but in unison with the horns 15 on rock-bar C, (which latter are setting the dogs for a new combination,) will restore such of the dogs as had been adjusted for the old combination (provided such dogs or any thereof are not to be included in the new combination) to their normal positions, for the dogs of the old combination which are to be restored are on stop-rods which are in a position to close and thereby to be impinged against by said horns 16.

The series of stop-rods 1 2 3 4, &c., in an organ often runs up to a considerable number—say, for instance, twenty or thirty—and the individual stop-rods are of a considerable length, and it is intended to provide for each stop-rod two or three of the three-armed dogs

at different heights thereon, thereby forming two or three series of dogs arranged in lines common to and transversely intersecting the stop-rods, and to provide horn-carrying rock-bars C and D and arm-carrying rock-bars G and H for the dog series in duplication or triplication of the single set thereof, substantially as illustrated, and it is intended to provide pedal and connecting mechanism therefor similar to that for and intervening between the front of the organ and the rock-bars C D and G and H. This is, however, only carrying the invention out in the equipment of an organ in a manner which will be entirely apparent to those skilled in the art of organ construction who have taken pains to familiarize themselves with the composition of the invention as hereinabove set forth, for thereby they can provide pedals for controlling and effecting combinations for forte effects, another pair of pedals operating on other rock-bars equipped as the ones C D and G H for setting or adjusting and effecting combinations for mezzo effects, and so on likewise for combinations for piano, melodia, and other well-known effects.

While the greater part of the mechanism constituting this invention is incased within the organ and concealed from view and not intended to be accessible except for repairs, it is readily seen that any manipulation, adjustment, or movement of the parts for any of the purposes hereinbefore explained or as apparent may be accomplished through the operation of the stops and pedals at the front of the organ.

Having fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In an organ, the combination, with a series of stop-rods independently movable and each provided with a member mounted thereon for a rotational movement and each having arms or extensions *m* *n*, and means respectively applied for independently moving each of said stop-rods into and out of its working position, and a rock-bar C, provided with a series of horns or extensions and means for rocking the same, whereby the horns thereof may contact with extensions *n*, of the members which are on stop-rods moved into working positions to partially rotate said members, and another rock-bar provided with a series of arms and means for actuating same, so that the arms thereof may be swung to contact with extensions *m* of stop-rods which are in their normal positions, but which members have been partially rotated as hereinabove, and all substantially as and for the purpose specified.

2. In an organ, the combination, with a series of stop-rods independently movable and means for independently moving the same, and each stop-rod provided with a member mounted thereon for a rotational movement, but constrained against an endwise movement on said stop-rod, each of said members having

arms or extensions *l* and *n*, of a means for securing a partial rotation of selected ones of said members and also for opening and closing series of said stop-rods, the rock-shaft D, having horns 16 thereon, adapted to engage arms *n* of said members and to restore said members to their normal positions as to rotation when the stop-rods carrying them are in their normal positions, and the rock-shaft H, having arms 24, which are adapted to engage said arms *l* when the members carrying them are in their normal positions as to rotation and their carrying stop-rods are in their open positions, substantially as described.

3. The combination, with a series of stop rods or members, each provided with an abutment-dog having arms *l*, *m*, and *n* and adapted for a partial rotation on the respective stop-rods and stop-knobs, and connections between same and said stop-rods for independently moving the latter into and out of their pipe-registering positions, of a pair of rock-bars C and D, having the horns 15 15 and 16 16, and a pedal and connections for simultaneously rocking said bars, rock-bars G and H, having thereon the arms 23 23 and 24 24, and a pedal and connections for simultaneously rocking said bars, combined for operation substantially as and for the purpose set forth.

4. In an organ, the combination, with the stop members or rods, of means for independently moving the same into and out of their positions, dogs respectively provided for said rods fixed against endwise movement thereon, but capable of a partial rotary motion thereon, and provided with a friction device for preventing all undue rotational movement thereof, and the rock-bar C, with the horns 15 15, and the rock-bar G, with the arm 23 23, substantially as and for the purpose set forth.

5. In a combination stop-action for organs, the stop-rods, each provided with a dog *h*, having arms, as *l*, *m*, and *n*, and an opening therein fitting said stop-rods, a bore radially formed in the said dog which terminates in the opening through which the rod passes, and a spring contained in said bore under compression and bearing upon the said stop-rod, stops for limiting the partial rotation of said dogs on their rods, and stops for maintaining the dogs against endwise movement on the rods, substantially as described.

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