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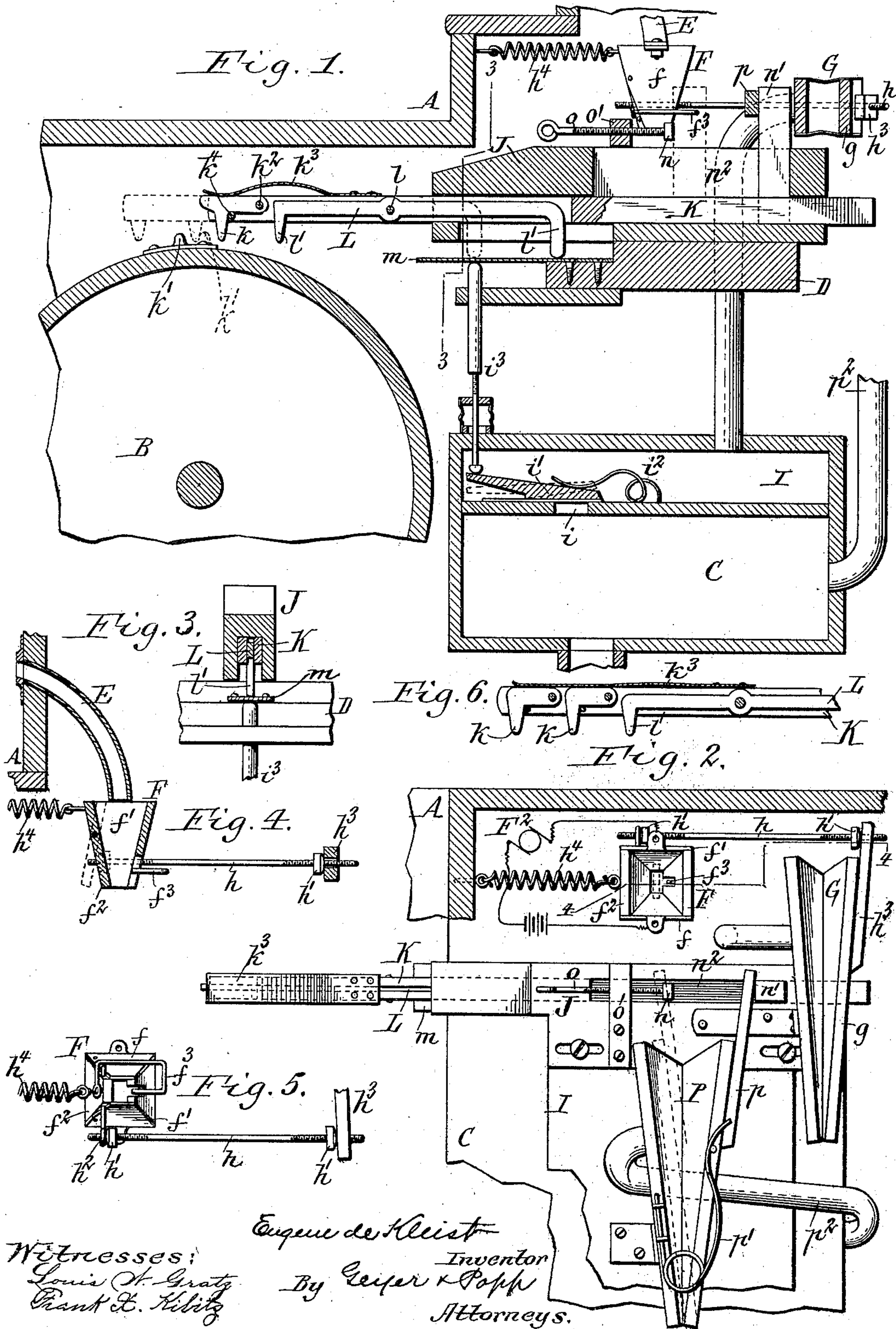
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E. DE KLEIST.

TUNE CONTROLLING DEVICE FOR MUSICAL INSTRUMENTS.

(Application filed Jan. 21, 1902.)

(No Model.)



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UNITED STATES PATENT OFFICE.

EUGENE DE KLEIST, OF NORTH TONAWANDA, NEW YORK.

TUNE-CONTROLLING DEVICE FOR MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 713,653, dated November 18, 1902.

Application filed January 21, 1902. Serial No. 90,638. (No model.)

To all whom it may concern:

Be it known that I, EUGENE DE KLEIST, a citizen of the United States, residing at North Tonawanda, in the county of Niagara and State of New York, have invented new and useful Improvements in Tune-Controlling Devices for Musical Instruments, of which the following is a specification.

This invention relates to an automatic controlling device designed more particularly to cooperate with the coin-controlled starting and stopping mechanism of an automatic piano or other musical instrument for causing the instrument to play a tune more than once for every deposit of a coin. A tune-controller of this character is described and shown in Letters Patent of the United States No. 679,026, granted to me July 23, 1901. The parts of such instruments are usually sensitive to changes of temperature and subject to warping and shrinkage, and devices supported by or attached to the same are therefore liable to become displaced and get out of order easily when so constructed as to require delicate and accurate adjustment for their successful operation.

It is the object of my invention to provide a controlling device of simple construction which requires no exact adjustment liable to be easily disturbed, but, on the contrary, admits of a certain degree of inaccuracy in position or adjustment without rendering the device inoperative or unreliable in action.

In the accompanying drawings, Figure 1 is a fragmentary vertical section of a self-playing piano operated by a rotary pin-barrel and equipped with my improved tune-controller. Fig. 2 is a fragmentary top plan view of the tune-controller and cooperating parts. Fig. 3 is a transverse vertical section in line 3 3, Fig. 1. Fig. 4 is a vertical section in line 4 4, Fig. 2. Fig. 5 is a bottom plan view of the coin intercepting and discharge hopper. Fig. 6 is a fragmentary sectional elevation showing a modification of the controller.

Like letters of reference refer to like parts in the several figures.

A indicates the upper portion of the case of an automatic piano of the kind in which the hammers are operated by a pneumatic-action,

and B is the rotary barrel which controls this action. The latter and the usual keys operated by the barrel form no part of my invention and are omitted for the sake of clearness.

C indicates the wind or exhaust chest of the instrument, which is arranged in rear of the pin-barrel and from which the air is exhausted by a bellows in a well-known manner, and D is the longitudinal bar or support arranged above the wind-chest and carrying the usual pivoted keys or fingers operated by the barrel.

E indicates a coin-chute extending through the wall of the case A and preferably provided at its lower end with a coin intercepting and discharge device forming the terminals of an electric circuit which contains a motor for driving the pin-barrel B and actuating the exhaust-bellows of the instrument. These terminals are arranged to arrest a deposited coin, so that the latter bridges and connects the terminals, thereby closing the circuit and causing the instrument to play as long as the coin is held between the terminals, while breaking the circuit and stopping the instrument when the coin is released. The intercepting device preferably employed for this purpose consists of a hopper F, having two opposite walls $f f'$, made of metal, to form the terminals of the motor-circuit F^2 . These walls converge downwardly and are arranged so closely together that the coin cannot drop through the throat left between them. The other two walls are made of insulating material, and one of them is constructed in the form of a hinged door f^2 , through which the intercepted coin is discharged laterally. The wall of the hopper opposite this door has a slot through which passes an ejecting-finger f^3 . This finger extends into the throat of the hopper and is carried by the door, so that when the latter is opened the ejector is caused to move across the throat and force the deposited coin sideways out of the hopper. My improved tune-controller acts upon this discharge-door and is constructed as follows:

G indicates a motor-pneumatic or small bellows having its movable board g connected with the vertically-swinging door f^2 by a rod h

in such manner that when the pneumatic is exhausted the door is opened and the coin discharged. The connecting-rod h is preferably screw-threaded and provided with adjustable stop-nuts h' , which bear against an ear h^2 of the door and an extension h^3 of the pneumatic to permit the throw of the door to be properly regulated. The door is closed by a spring h^4 , having one end connected with the door above its hinge and its other end attached to the wall of the case of the piano or other stationary part. As the movable board of the pneumatic G is connected with this door, the spring h^4 also serves to expand the pneumatic. This pneumatic is connected with a valve-chamber I , which communicates with the exhaust-chest C by a passage i . The latter is controlled by a valve i' , which when closed cuts off the pneumatic from the exhaust-chamber and when opened allows the pneumatic to communicate with the chest for collapsing the same. The valve i' is closed by a spring i^2 and opened by a sticker i^3 , which extends upwardly through the valve-chamber I .

J indicates a rigid guide or block mounted upon the supporting-bar D or other suitable support and arranged at right angles to the pin-barrel B . This block is provided in its under side with a longitudinal groove, in which is guided a slide or carrier K . This slide overhangs the pin-barrel and carries at its front end a depending shifting key or pawl k , arranged to be engaged by a tappet or tripper k' on the periphery of the barrel, so that when said tripper by the forward rotation of the barrel strikes said pawl it pulls the slide K forwardly until the tripper clears the pawl, when it allows the slide to remain at rest. This pawl is yieldingly mounted on the slide and for this purpose is pivoted in a longitudinal slot of the slide by a horizontal pin k^2 and held against upward movement by a spring k^3 of sufficient stiffness to hold the pawl normally in its depressed position and cause the same to draw the bar forward when engaged by the tripper of the pin-barrel B . The downward movement of the pawl k is limited by a stop-pin k^4 on the slide.

The slide also carries a vertically-swinging operating key or lever L , which is arranged in rear of the shifting-pawl k and pivoted in the slot of the slide by a horizontal pin l . This operating-lever has at its front end a nose l' , which is arranged to be tripped by the tappet k' of the barrel B when the slide K is in its extended position, so as to raise the front arm of the lever and depress its rear arm. This rear arm is provided with a foot l'' , which is arranged to stand over the sticker i^3 in the extended position of the slide, so that when the lever L is rocked on its pivot in this position of the slide its rear arm depresses the sticker and opens the valve i' , thereby exhausting the air from the pneu-

matic G and causing the latter to open the door of the coin-discharge hopper F . The rear arm of the rock-lever L is longer or heavier than its front arm to keep the same in its normal position by gravity, and the foot of this lever rests loosely upon a horizontal guide strip or spring m , secured at its rear end to the supporting-bar D and extending forwardly over the top of the sticker i^3 , so that when the lever L is actuated it acts upon this sticker through the guide-spring m , the free end of the spring yielding to the pressure of the lever and returning to its normal position when the rear arm of the lever rises. This guide-spring not only forms a smooth support for the foot of the rock-lever as the latter slides back and forth with the slide, but serves as an intermediate pressure-transmitter, which insures the depression of the sticker i^3 even if the foot of the lever should not stand directly over the sticker in the extended position of the slide, owing to inaccurate workmanship or other causes. The forward movement of the slide is limited by a stop n , located in the path of an arm or post n' , which extends upwardly from the slide and moves in a longitudinal slot n^2 in the guide-block J , as shown in Fig. 1. This stop preferably consists of a horizontal screw o , carried by a bracket o' , secured to the top of said block. By this construction the forward stroke of the slide can be regulated to properly position its shifting-pawl k and rock-lever L with reference to the tripper k' of the pin-barrel.

P indicates a bellows or pneumatic located at one side of the slide K and having its movable board arranged to swing forwardly and backwardly. This board has an extension p , which is arranged on the front side of the post n' of the carrier and adapted to bear against the same above the plane of the stop-screw o . The pneumatic P is provided with a spring p' , which tends to swing its movable board rearwardly, so as to cause the same to return the slide from its extended to its retracted position. This pneumatic constantly communicates with the exhaust-chest C by a tube or conduit p^2 , so that the same is collapsed in opposition to its spring p' when said chest is exhausted by the operation of the instrument and remains collapsed so long as the instrument continues to play, while when the instrument is stopped the exhaustion of the air from the exhaust-chest and said pneumatic ceases and the latter allows its strained spring to react and swing the movable board of the pneumatic rearwardly. By this construction the extension p of the pneumatic is moved forward out of the way of the post of the slide when the instrument is started and held in that position by the atmospheric pressure upon the exterior of said exhausted pneumatic until the instrument is stopped, when the spring p' returns the ex-

tension to its rearward position, thereby shifting the slide back to its former position preparatory to its next forward stroke.

In the normal condition of the parts the door of the coin-intercepting hopper F is closed and the slide K is in its retracted position, as shown by full lines in Fig. 1. In this position the shifting-pawl k of the slide stands over the axis of the pin-barrel B, or nearly so, and in the path of the tripper k' of the latter, while the nose of the rock-lever L, which is of about the same length as the nose of said shifting-pawl, clears said tripper, owing to its location behind the shifting-pawl and the tangential arrangement of the slide with reference to the pin-barrel.

Upon dropping a proper coin into the chute the same falls into the hopper F and is arrested by the metallic walls of the latter, against which it bears edgewise. The motor-circuit F^2 is thereby closed and the instrument caused to play. After the pin-barrel has made a complete turn and caused a tune to be played once its tripper k' strikes the shifting-pawl k and draws the slide forwardly until it is arrested by the stop n , thereby bringing the nose of the rock-lever L into the path of travel of said tripper and its foot l over the sticker i^3 , as shown by dotted lines in Fig. 1. When the slide K is thus arrested, the tripper deflects the yielding pawl upwardly and clears the same. The resistance of the pawl-spring k^3 must obviously be greater than the friction between the slide and its guide in order to shift the slide. When the pin-barrel has completed its second turn and caused the instrument to repeat the tune, its tripper encounters the nose of the operating-lever L, rocking the latter on its pivot and causing it to depress the sticker i^3 , thereby opening the valve i' and collapsing the pneumatic G, while the latter in turn opens the door f^2 of the coin-hopper, discharging the coin from the hopper, breaking the motor-circuit, and stopping the instrument. As soon as the tripper k' clears the nose of the rock-lever L the sticker i^3 is allowed to rise and the valve i' permitted to close, thereby cutting off the door-operating pneumatic G from the exhaust-chest C, allowing said pneumatic to expand and closing the door of the coin-hopper.

The exhaustion of the air from the spring-retaining pneumatic P ceases when the instrument stops, and the movable board of this pneumatic is thereupon swung backward by the spring p' , thereby shifting the slide K backward to its original position, as heretofore described. During this backward movement the yielding shifting-pawl k trips over the barrel-tappet k' , and in order to permit of this action the power of the spring applied to the pneumatic P must necessarily exceed the resistance of the pawl-spring k^3 .

It will now be understood that the operating-key or rock-lever L, which controls the

discharge of the coin and the operation of the instrument, is moved into and out of the path of the tripper on the pin-barrel B or equivalent traveling member by the shifting-pawl k of the slide K, which pawl is acted upon by the tripper in advance of said rock-lever, and that when a single shifting-pawl is employed in connection with such a key or rock-lever the instrument is caused to play a tune twice before stopping. It is obvious, however, that the instrument could be caused to repeat a tune a greater number of times by duplicating or multiplying the number of shifting-pawls and arranging them one in advance of another, as seen in Fig. 6, where two shifting-pawls are shown. In this case the tune will be played three times for each coin deposited, the barrel-tapper k' tripping the two shifting-pawls successively after completing its first and second turns and actuating the rock-lever L after completing its third turn. This shifting pawl or pawls and the rock-lever of the slide do not require accurate adjustment, but will permit of more or less displacement or imperfection in workmanship within certain limits without interfering with the operation of the tune-controller or rendering it liable to get out of order. The controller can therefore be more coarsely and cheaply constructed and placed in position in less time than devices whose successful operation depends upon accurate workmanship and delicate adjustment.

When the controller is applied to an instrument having a pneumatic-action, I prefer to operate the same by pneumatic means, as herein shown and described; but I do not wish to limit the invention to that construction, because it could be used with a coin-intercepting device operated from the rock-lever L by mechanical means, and the return stroke of the slide K could likewise be effected by mechanical devices.

While my improvement is especially desirable as a tune-controller for musical instruments, it may also be applied to other coin-operated machines, such as automatic vending and photographing machines, for controlling the amount of merchandise delivered by the machine or the number of times the machine performs a certain operation or cycle of operations for every deposit of a coin.

I do not wish to claim in this application the construction of the coin-intercepting hopper F herein shown and described, as the same forms the subject of another application for patent filed by me on the 3d day of March, 1902, Serial No. 96,519.

I claim as my invention—

1. The combination with a member to be actuated, of a traveling member, a carrier arranged to be engaged by said traveling member and adapted to be advanced thereby, an operating device for the member to be actuated which is arranged to clear said trav-

eling member in the normal position of the carrier and to be engaged thereby in the advanced position of the carrier, and means carried by the carrier for advancing said operating device therewith, substantially as set forth.

2. The combination with a member to be actuated, of a traveling member having a tappet or tripper, a carrier having a shifting key or pawl arranged in the path of said tripper and adapted to be advanced thereby, and an operating key or lever for the member to be actuated, mounted on the carrier and arranged to clear said tripper in the normal position of the carrier and to be engaged thereby in the advanced position of the carrier, substantially as set forth.

3. The combination with a member to be actuated, of a traveling member having a tappet or tripper, a slide having a shifting key or pawl arranged in the path of said tripper, and an operating key or lever for the member to be actuated pivoted to said slide in rear of said shifting-key and arranged to be operated by said tripper when the slide is shifted out of its normal position, and means for returning said slide to its initial position, substantially as set forth.

4. The combination with a member to be actuated, of a rotary barrel having a tappet or tripper, a slide arranged tangentially to said barrel and having a yielding shifting key or pawl located in the path of said tripper, and an operating key or lever pivoted on said slide in rear of said shifting-key, said operating-lever standing in the path of said tripper when the slide is in its advanced position and being constructed to operate upon the member to be actuated in the last-named position, substantially as set forth.

5. The combination with a member to be actuated, of a traveling member having a tappet or tripper, a slide having a shifting key or pawl arranged in the path of said tripper, and an operating key or lever for the member to be actuated mounted on the slide in rear of said shifting-pawl and arranged to be engaged by said tripper in the advanced position of the slide, and an adjustable stop arranged to limit the forward movement of the slide, substantially as set forth.

6. The combination with a member to be actuated, of a yielding guide extending over the same, a traveling member having a tappet or tripper, and a carrier having a shifting key or pawl arranged in the path of said tripper, and an operating key or lever mounted on the carrier behind said shifting-pawl and having a foot which bears upon said yielding guide and a nose arranged to stand in the path of said tripper in the advanced position of the carrier, substantially as set forth.

7. The combination with a wind-chest, a valve-chamber communicating therewith and

a valve controlling the passage between said chest and chamber, of a motor-pneumatic connected with said valve-chamber and arranged to operate the desired part or member, a traveling member having a tappet or tripper, and a carrier having a shifting key or pawl arranged in the path of said tripper, and an operating key or lever for said valve mounted on the carrier behind said shifting-key, substantially as set forth.

8. In a musical instrument, the combination of a wind-chest, a member to be actuated, a traveling member having a tappet or tripper, a carrier having a shifting key or pawl arranged in the path of said tripper and an operating key or lever for the member to be actuated mounted on said carrier behind said shifting-pawl and arranged to be struck by said tripper in the advanced position of the carrier, a return-spring arranged to retract the carrier, and a pneumatic connected with said wind-chest and operating to hold said spring under tension but in an inoperative position while the instrument is playing, substantially as set forth.

9. The combination of an exhaust-chest, a member to be actuated, a traveling member having a tappet or tripper, a carrier having a shifting key or pawl arranged in the path of said tripper and an operating key or lever for the member to be actuated mounted on said carrier behind said shifting-pawl and arranged to be struck by said tripper in the advanced position of the carrier, a pneumatic communicating constantly with said exhaust-chest and having its movable board arranged to retract said carrier when the pneumatic is expanded, and an expanding-spring acting upon said movable board, substantially as set forth.

10. The combination with an exhaust-chest, a valve-chamber communicating therewith and a valve controlling the passage between said chest and chamber, of a coin-intercepting device having terminals of a motor-circuit arranged to be connected by a deposited coin, a discharge device for the intercepted coin, a pneumatic connected with said exhaust-chest and operating said discharge device, a traveling member, a carrier arranged to be engaged by said member and adapted to be advanced thereby, an operating device for said valve arranged to clear said traveling member in the normal position of the carrier and to be engaged thereby in the advanced position of the carrier, and means for returning said carrier to its initial position, substantially as set forth.

11. The combination with an exhaust-chest, a valve-chamber communicating therewith and a valve controlling the passage between said chest and chamber, of a coin-intercepting device having terminals of a motor-circuit arranged to be connected by a deposited coin, a discharge device for the intercepted

coin, a pneumatic connected with said exhaust-chest and operating said discharge device, a pin-barrel having a tripper, a slide overhanging said barrel and carrying a yielding shifting-pawl which is arranged in the path of said tripper, and an operating-lever for said valve arranged behind said pawl, a pneumatic constantly communicating with said exhaust-chest and having its movable

board arranged to shift the slide rearwardly, and an expanding-spring operating to expand said pneumatic, substantially as set forth.

Witness my hand this 15th day of January, 1902.

EUGENE DE KLEIST.

Witnesses:

CARL F. GEYER,
THEO. L. POPP.