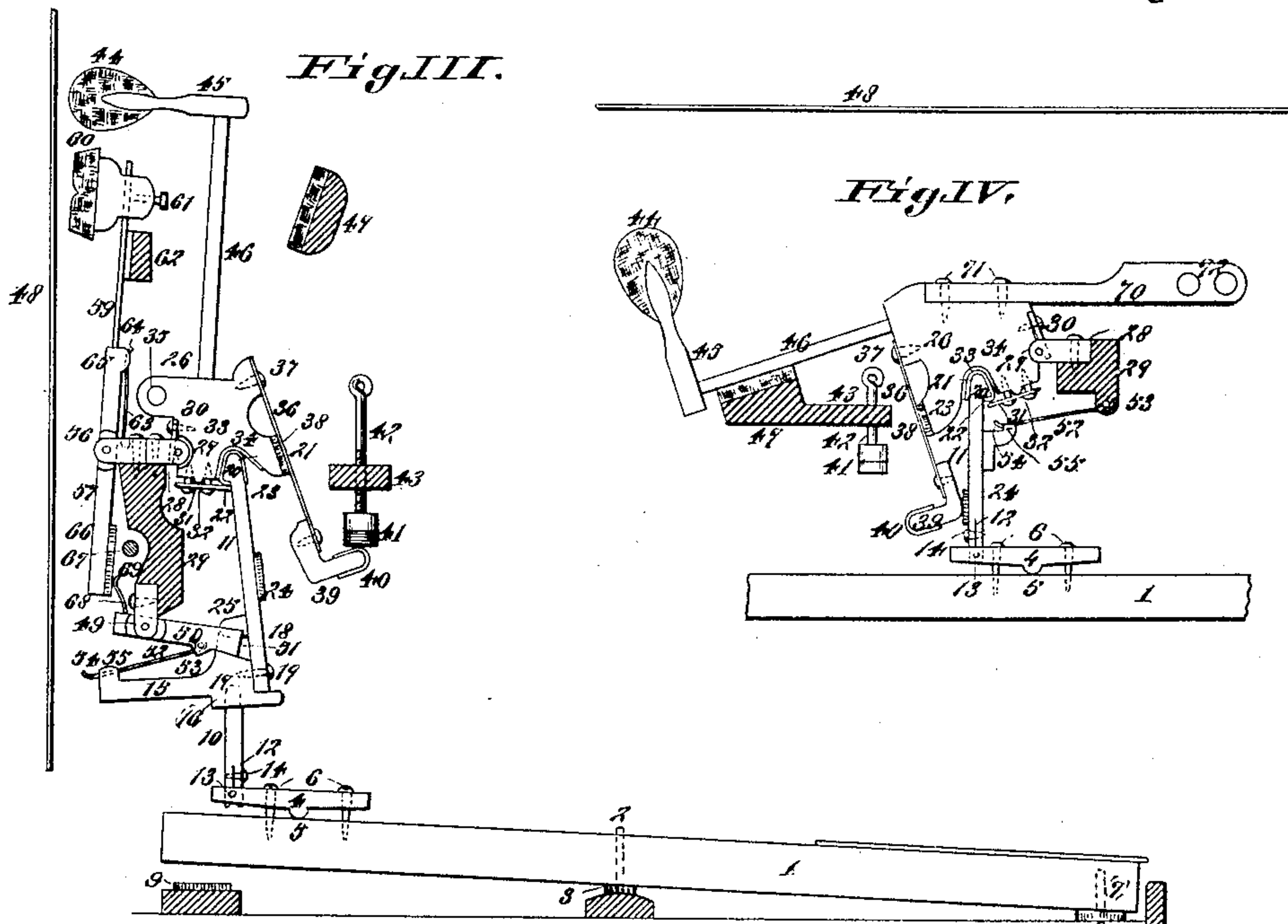
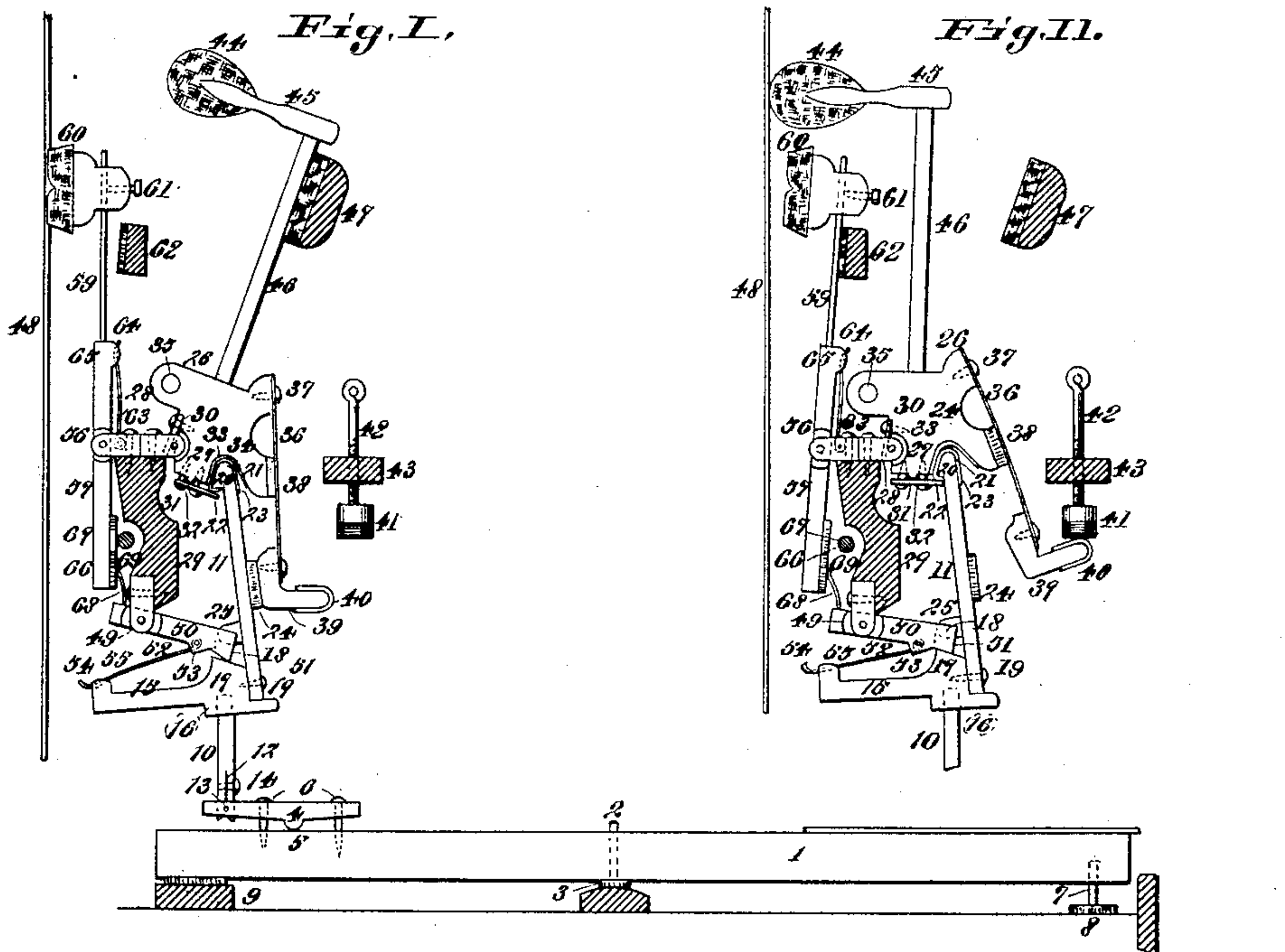


(No Model.)

J. C. ANTON.
REPETITION PIANO ACTION.

No. 476,115.

Patented May 31, 1892.



Attest:
Charles Pickles,
S. Cotton

Inventor,
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By Knight Bros.
attys.

UNITED STATES PATENT OFFICE.

JOHN C. ANTON, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO
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REPETITION PIANO-ACTION.

SPECIFICATION forming part of Letters Patent No. 476,115, dated May 31, 1892.

Application filed October 9, 1891. Serial No. 408,246. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. ANTON, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Repetition Piano-Actions, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

10 This invention relates to a system of adjustable compound levers, with associate springs and buffer-cushions, that operate the hammer to a single strike and counteract its tendency to repeat the same; and the invention consists, to effect said purpose, in a stiff
15 blade spring or bar that is secured to the hammer-butt above the level of its pivotal bearing and whose controlling-foot is below said level, which foot at a time nearly coincident with the striking of the hammer strikes
20 an adjustable buffer-button, thereby reversing the action of the blade-spring, which had moved in the direction of the forward movement of the hammer, and making said blade-spring and the hammer-butt it controls to rebound backward from the direction of the
25 string, and thereby, after the first strike of the hammer, abutting and counteracting the objectionable volunteer reiteration of its
30 strike that is caused by the rebounding of the hammer-butt from the head of the lifting-jack; and the invention further consists in features of novelty hereinafter fully described, and pointed out in the claims.

35 Figure I is a side elevation of the device in its normal position at rest. Fig. II is a side detail elevation of the same and shows the parts in the respective positions they assume when the hammer strikes. Fig. III is also a
40 side elevation of the same and shows the hammer and the pendent blade-spring in the respective positions they assume when, after the single strike of the hammer, the blade-spring and the hammer-butt it controls prevent the reiterated strike of the hammer; and
45 Fig. IV is a modification of the device, which adapts it for use with grand, square, and other horizontal movements.

Referring to the drawings, 1 represents one

of the keys; 2, the center-pin, on which and 50 on its cushion 3 said key works.

4 is the regulating-frog, 5 the rocker-foot of said frog, and 6 the set-screws that secure the adjusted position of said frog.

7 represents the guide-pin on which the 55 key works. 8 is a felt cushion around said pin, on which the tappet end of the key rests when depressed, and 9 is the forward cushion, that rests the key in its normal inactive position.
60

10 represents the abstract or pedestal on which the lifting-jack 11 is mounted. The said abstract has a forked base 12, that is seated in the slotted end of said frog and which is secured by the pin 13 by the aid of 65 the set-screw 14, which closes said forks on said pin.

15 represents the extended arm of the jack, the perforate seat 16 in whose butt 17 is mounted on the top of said abstract.
70

18 represents the jack-shank, the foot of which is secured to the butt 17 by the attachment-screw 19 and whose conical head 20 is covered around its crown 21 and chin 22 by a felt cushion 23. 24 is a cushion on the rear 75 side of said jack-shank, and 25 is a projecting lug on the forward side of said shank.

26 represents the eccentrically formed and operated hammer-butt which has its bearings on the journal-pin 27, which journal-pin is 80 seated in the forks of the bifurcated bracket 28, which bracket is secured by attachment-screws to the main rail 29, to which the movement devices are attached. A button-plate 30 is secured by a screw to the hammer-butt, 85 and as said hammer-butt works on its journal-pin between the forks of said bracket 28 the said button-plate secures said hammer-butt to its journal-bearings.

31 represents a regulating frog-plate, which 90 is adjustably secured by screws to the lower face of said hammer-butt, to which adjustment it rocks on the arc-lug 32, that projects from said hammer-butt. The projecting lip of said frog-plate chucks or engages under 95 the chin 22 of the jack-head, and as the key rises from its depression aids the back-throw of the hammer.

33 represents a saddle-recess in the hammer-butt immediately above the jack-head. 34 is a felt cushion that underlines said saddle, and 35 is a plug balance-weight in the upper forward horn of the hammer-butt.

36 represents the blade spring or bar, which is preferably a stiff spring, but may be a bar, and which, as will be described hereinafter, with its coadjutory elements, form important elements of the invention to prevent the volunteer restriking of the hammer. The said blade-spring is at its upper end secured to the rear upper horn of the hammer-butt by the screw 37 and hangs pendent therefrom.

38 is a fulcrum-cushion, that is attached to and projects from the lower rear horn of the hammer-butt, against which cushion the blade-spring rests midway and against which it fulcrums when said blade-spring becomes operative to arrest the restriking of the hammer.

39 represents an angle trip-foot, that is secured by a screw to the lower end of the blade-spring, and 40 is a felt cushion around the rearwardly-projecting toe of said foot. While I show and prefer said blade-spring and angle-foot attachment, as it is more quickly responsive and lively in its movement than a bar, yet a bar with an upturned foot may be used in its stead.

41 represents a cushioned buffer-button that hangs pendent from the screw-adjustable rod 42, whose screw is seated and adjusted in the button-rail 43.

44 represents the hammer, whose head-block 45 is mounted on the hammer-shank 46, the said shank being mounted in the upper face of the hammer-butt, and 47 is the cushioned soft-pedal rail, against which the hammer-shanks rest in their inactive normal positions, to which they return after striking the strings 48.

49 represents a bifurcated hanger-bracket that is secured by a screw to the lower end of the main rail 29, and 50 is the damper-lever, which is seated and journaled between the forks of said hanger-bracket. The said damper-lever at its rear end is provided with a bevel-faced bifurcated foot 51, that rides on a downward incline on the upper bevel-face of the butt 17 on the extended arm of the jack. The projecting lug 25 on the forward side of the jack-shank rides between the forks of the bifurcated foot 51 of said damper-lever to hold the head 20 of said jack from lateral displacement from its saddle-seat 33 in the hammer-butt.

52 represents a strap-spring whose upper fast end is journaled between the underhung lugs 53 on the lower side of the damper-lever and whose curved runner-nose 54 works between the upwardly-projecting lugs 55 of the extended arm 15 of the lifting-jack. The said spring, in conjunction with the bevel-footed damper-lever that rides on its inclined seat on the bevel-butt 17 of the extended arm 15 of the jack, facilitates the prompt return of

the key, and also of the hammer, to their normal positions. The said parts also aid to retain the jack-head in its saddle-seat in the hammer-butt.

56 represents the bifurcated damper-bearer bracket which is secured by a screw to the top of the main rail and projects forward beyond it, and 57 is the butt-shaft of said damper, which works on its journal-pin 58 between the forks of said bifurcated bracket.

59 is the damper-shank.

60 is the damper-cushion which is adjusted and secured on its shank by the set-screw 61, and 62 is the cushioned rail, against which the damper rests in its normal inoperative position.

63 represents a projectile spring that is secured to the damper-bearer bracket 56 and rises vertically therefrom and whose curved runner end 64 works within the rearwardly-projecting lugs 65 at the top of the butt-shaft 57 of the damper.

66 represents a cushion on the rear side at bottom of the butt-shaft, and 67 is a buffer stay-pin against which said cushion rests when the damper touches the wire.

68 represents a foot-spring that is secured to and rises vertically from the forward end of the damper-lever 50 and whose curved runner end 69 presses against said cushion 66 at the foot of the butt-shaft 57 to facilitate the withdrawal of the damper from the string.

70 represents a balance-lever that is secured by the screws 71 to the hammer-butt in my modification (shown in Fig. IV) that is adapted to horizontal actions, which lever is provided with the plug-weights 72, and counter-balances the hammer on its horizontal shank.

The operation of the device is as follows: When the key is pressed down with the usual sufficient force for the hammer to strike the string, the latter part of its forward course from about the position shown in Fig. III is effected by the momentum of the hammer, and to which position after striking the string it immediately rebounds, and it is highly important that the hammer should be immediately restrained from a volunteer reactionary strike. This objectionable feature is prevented in my device by the counteracting functions of my stiff blade spring or bar 36 the hammer-butt it controls, and the other coadjutant elements of the device. The said blade-spring is fastened to the upper horn of the hammer-butt at a point above the center bearing of said hammer-butt, from which it hangs pendent, and its foot 39, which is on a lower plane than the journal-bearing of said hammer-butt, about coincidently with the striking of the hammer, strikes the adjustable buffer-button 41, and said blade bar or spring, pressing against its fulcrum-cushion 38, rebounds with the hammer-butt it controls, and thus counteracts and nullifies the reactionary tendency of the hammer to restrike, and it remains poised in the position shown in Fig. III. It will also be seen that other

elements in the device coact with said blade-spring to bring the hammer-butt, and thereby the hammer, to a quickly quiescent condition of perfect rest, thus not only preventing the reiteration of the hammer's strike, but also quieting the tremor in the action, and thus securing a clearer modulation of the tones. Among said coacting elements is the lifting-jack, which, instead of having the customary escapement beneath the hammer-butt, (which escapement is one of the most fruitful causes of disarrangement in piano-movements,) is seated in a cushioned saddle 33 in said hammer-butt, and is not required to neither does it ever escape from its saddle; also, said constantly-saddle-seated jack-head insures an undeviating response of the movements to the slightest touch of the keys. Again, it will be seen that as the key is depressed and elevates the jack the front of the extended arm 15 of the jack is elevated, thereby compressing the spring 52 and bringing the bevel end of the damper-lever 50 into coincidence with its bevel saddle-seat on the butt 17 of said jack-arm 15, thereby not only throwing back the damper 60 by the foot-spring 68, but also facilitating the prompt return of both the key and hammer to their normal position, so that besides aiding, as stated, to prevent a reiterated strike of the hammer it also prevents a lingering strike, making the strike more definite and clear. It also keeps the head of the lifting-jack in constant contact with its saddle in the hammer-butt, and the head of the jack is kept from lateral displacement in its saddle-seat in the hammer-butt by the projecting lug 25, which is seated and works in the bifurcated end of the damper-lever 50. It will also be seen (see Fig. II) that when the hammer strikes, the saddle-cushion in the hammer-butt alone presses against the forehead of the jack, while the said saddle being elevated free from the crown and back of said jack-head still further facilitates the prompt retirement of the hammer from the string before the fingers have even time to leave the key.

The plug-weight that balances the hammer-butt and its coadjutary movements is important, so that the slightest touch on the key may meet its responsive action.

I claim as my invention—

1. In a repetition piano-action, the combination of the pivoted eccentric hammer-butt, the hammer mounted thereon, and the pendent blade 36 and buffer-button that control said hammer-butt and prevent the volunteer restriking of the hammer, substantially as described.

2. In a repetition piano-action, the combination of the pivoted eccentric hammer-butt, the hammer mounted on said butt, the pendent blade-spring secured to the hammer-butt above the level of its pivot-bearing and having a trip-foot below said level, and the adjustable buffer-button that said trip-foot collides with, substantially as described.

3. In a repetition piano-action, the combination of the pivoted eccentric hammer-butt, the hammer mounted on said butt, the pivot on which said butt is journaled, the blade-spring secured to the hammer-butt above the level of its pivot-bearing, the trip-foot at the bottom of said blade-spring on a level below that of said journal-bearing, the fulcrum-cushion 38 on said hammer-butt, and the buffer-button that said trip-foot collides with, substantially as described.

4. In a repetition piano-action, the combination of the pivoted eccentric hammer-butt, the balance plug-weight 35 in said butt, the hammer mounted on said butt, the pendent blade 36, secured to the hammer-butt above the level of its pivot-bearing, the trip-foot at the bottom of said pendent blade on a level below that of said journal-bearings, the fulcrum-cushion 38, arranged as a fulcrum to said pendent blade, the button-rail 43, the adjustable screw-button rod 42, and the cushioned buffer-button secured to said rod, substantially as described.

5. In a repetition piano-action, the combination of the pivoted key, the regulating-frog 4, adjustably attached to said key, the abstract or pedestal 10, mounted on said frog, the extended jack-arm 15, mounted on said pedestal, the jack-shank 18, secured to said arm, the conical head 20, that surmounts said shank, the pivoted hammer-butt 26, and the saddle in said butt that rides on said head of the jack, substantially as described.

6. In a repetition piano-action, the combination of the pivoted key, the regulating-frog 4 and its rocker-foot 5, adjustably mounted on said key, the abstract or pedestal 10, the extended jack-arm 15 with its bevel butt-seat 17, the jack-shank 18, the conical jack-head 20, the hammer-butt 26, the saddle 33 in said butt that rides said jack-head, the damper-lever 50, the bevel-faced foot of said lever that rides the bevel-butt 17 of said jack-arm, the upwardly-projecting lugs 55 of said extended jack-arm, the underhung lugs 53 on the damper-lever, and the strap-spring 52, that is journaled in said lugs and whose working runner-nose 54 works between said lugs 55, substantially as described.

7. In a repetition piano-action, the combination of the pivoted key, the adjustable regulating-frog 4, the abstract 10, the extended jack-arm 15, having the bevel butt-seat 17, the jack-shank 18, the conical cushioned jack-head 20, having the projecting chin 22, the pivoted hammer-butt, the cushioned saddle 33 in said butt, the rocker arc-lug 32, and the adjustable regulating frog-plate 31, that chucks under the chin 22 of the jack-head, arranged to aid the back-throw of the hammer, substantially as described.

8. In a repetition piano-action, the combination of the pivoted key, the adjustable regulating-frog 4, the abstract 10, the extended jack-arm 15, having the bevel butt-seat 17, the jack-shank 18, the conical cushioned jack-

head 20, having the projecting chin 22, the pivoted hammer-butt, the cushioned saddle 33 in said butt, the rocker-lug 32, the adjustable frog-plate 31, that chucks under said chin 5 of the jack-head to facilitate the back-throw of the hammer, the damper-lever 50, the bifurcated hanger-bracket 49 in which said damper-lever is journaled, and the lug 25, that projects from the forward side of the 10 jack-shank and works between the forks of the damper-lever to restrain the jack from lateral displacement, substantially as described.

9. In a repetition piano-action, the combination of the key, the center pin on which 15 said key works, the guide-pin 7, that guides the tappet end of said key, the adjustable regulating-frog 4, the abstract 10, that supports the lifting-jack, the extending arm 15 of said lifting-jack with its bevel-butt 17, the 20 damper-lever 50, having the bifurcated bevel-foot 51, that works on said bevel-butt 17, the hanger-bracket 49, secured to the main rail, in which bracket said damper-lever is journaled, the reactionary spring 52, the shank 25 18 of the jack, the conical head mounted

thereon, the cushion 24, secured to said shank of the jack, the pivoted hammer-butt, the hammer mounted thereon, the saddle in said hammer-butt mounted on the conical head of 30 the jack, the pendent controlling-blade 36, secured to said hammer-butt above the level of its journal-bearing, the trip-foot secured to said controlling-blade beneath the level of 35 said journal-bearing, and which trip-foot has its return rest on said cushion 24, and the adjustable buffer-button 41, substantially as described.

10. In a repetition piano-action, the combination of the hammer-butt, the hammer 40 mounted on said butt, the balance-lever 70 and the plug-weight it carries, the main rail 29, the bifurcated bracket 28, secured to said main rail, the journal-pin 27, secured in said bracket on which said hammer-butt has its 45 journal-bearings, and the button-plate 30, secured to said hammer-butt that holds it to its journal-bearings, substantially as described.

JOHN C. ANTON.

In presence of—

BENJN. A. KNIGHT,
SAML. KNIGHT.