

No. 610,963.

Patented Sept. 20, 1898.

A. FERNER.
PIANO ACTION.

(Application filed Oct. 21, 1897.)

(No Model.)

FIG. 1

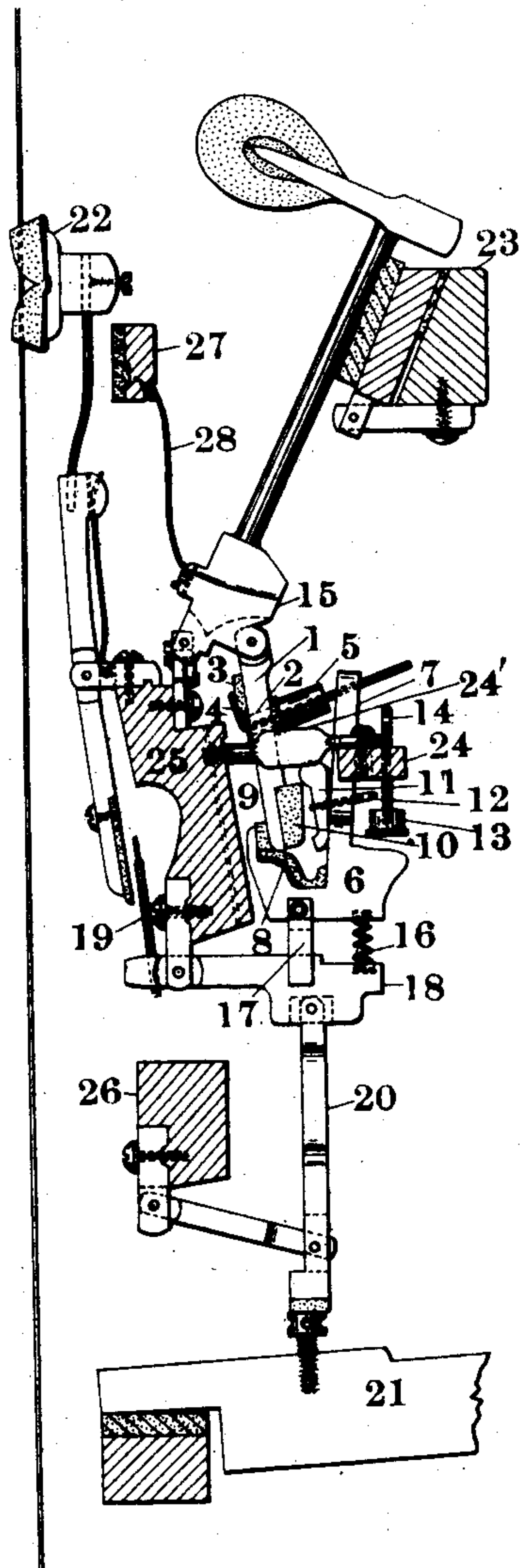


FIG. 2

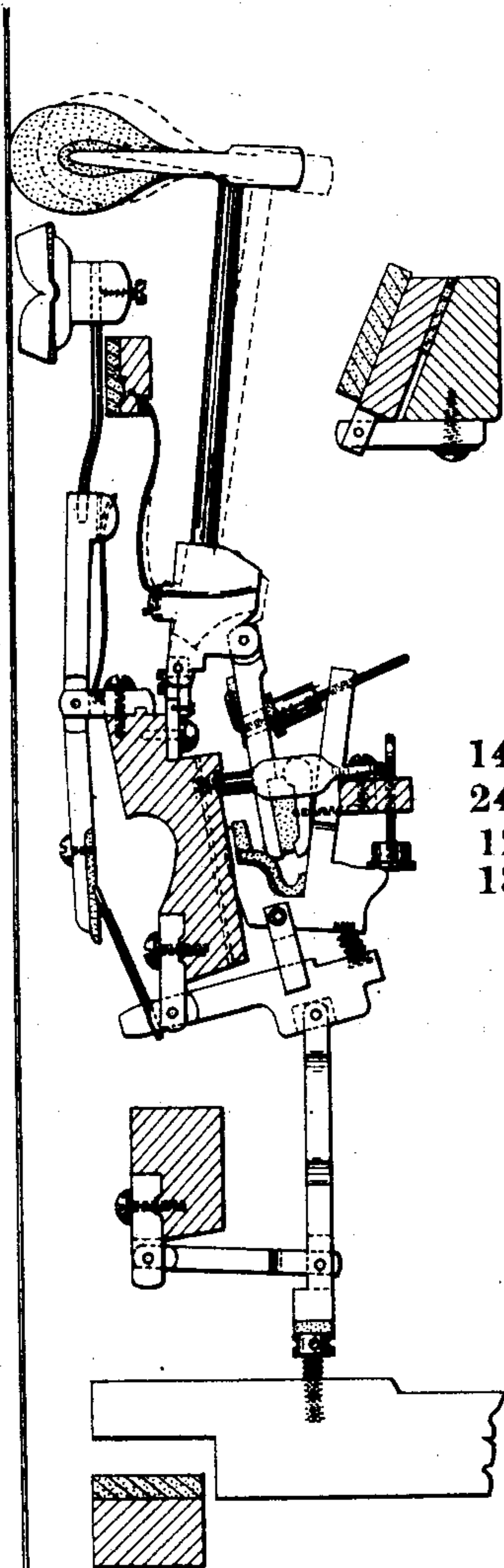
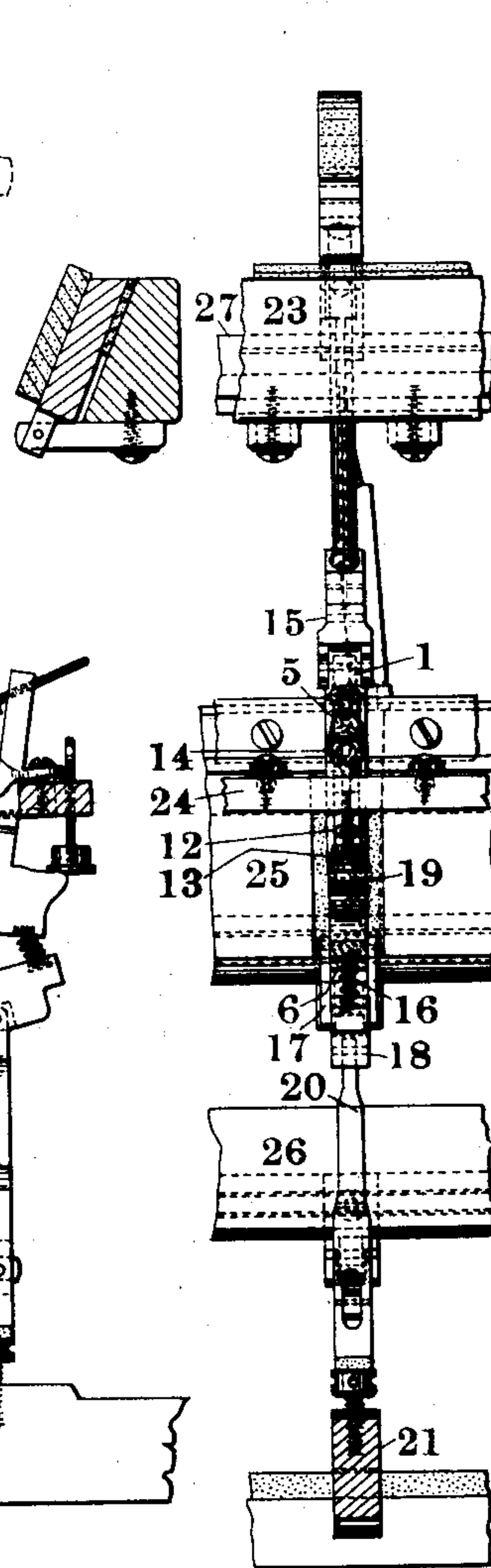


FIG. 3



WITNESSES

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UNITED STATES PATENT OFFICE.

ADOLPH FERNER, OF CHICAGO, ILLINOIS.

PIANO-ACTION.

SPECIFICATION forming part of Letters Patent No. 610,963, dated September 20, 1898.

Application filed October 21, 1897. Serial No. 655,920. (No model.)

To all whom it may concern:

Be it known that I, ADOLPH FERNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Piano-Actions, of which the following is a specification.

My invention relates to piano-actions, particularly to the connection between the hammer-butt and that part which in old actions is termed the "jack-bed" or "rocker," and is particularly applicable to upright pianos.

The objects of my invention are to improve the repeating action of the hammer, to reduce the friction on the felt or padding and thereby diminish the wear on same, to reduce the extent of travel of the jack in letting off the hammer, to provide for unfailing striking of the hammer by keeping the jack in constant control and so constructing the parts as to avoid the choking which is caused by the swelling of some of the parts in other actions, to arrange the parts so that the same may be readily separated for repair, to provide for simple and perfect regulation, and to provide for simplicity, durability, and cheapness of construction. I accomplish these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of an upright-piano action constructed according to my invention, showing the different members of the supporting-frame in section and showing the position of the parts when the key is at rest in its normal position, the key 21 being broken away. Fig. 2 is the same view, but showing the position of the parts at the instant the key is struck and indicating by dotted lines the position of the hammer as the same is let off immediately after the key is struck and while the same is still depressed. Fig. 3 is a front view of the action as shown in Fig. 1, with the key shown in section.

The parts to which my invention has particular reference are numbered 1 to 12, inclusive, and form the connection between the hammer-butt 15 and the rocker 18. The other parts shown are old. The members 23 to 27, inclusive, are parts of the frame.

The member 27 with the hammer-butt spring 28 may be omitted, as such spring is not necessary to the operation of my device;

but these parts are shown for the purpose of comparison with other actions and since the same may be used with my device, if desired, as additional means for letting off the hammer.

It will be seen from the drawings that in my device that part which in old actions is termed the "jack-bed" or "rocker" consists of two members, of which the member 6 is properly the jack-bed and the member 18 is the rocker. These parts will therefore be so termed in the following description.

Referring to the main parts of my invention, the jack 1 is pivoted to the hammer-butt 15. The jack-bed 6 is pivoted to the rocker 18. The jack-bed 6 has an arm 7, to which is secured the jack-catch 11, and the hook 4, passing through the slot 2 in the jack and having thereon a stop 5.

The stop 13, supported by the screw 14 in the member 24 of the frame, operates upon the outer shoulder on the jack-bed in like manner as the same operates directly on a shoulder on the jack in old actions. This stop, however, is more accessible for regulation in my device on account of the absence of the back-check, which in old actions extends upward from the rocker and in front of this stop. The member 24 is supported by the arm 24' on the member 25 in the usual manner.

The jack 1 is in contact with the shoulder 8 both before the key is struck and when depressed. It is constantly either touching or nearly touching the same, thus providing for very rapid repeating without entirely releasing the key. With the form of the shoulder 8 shown the jack is separated from the shoulder very slightly after the stroke just before the hammer resumes the position shown in Fig. 1 and when the jack is against the shoulder 9. This separation is, however, scarcely perceptible, the jack even then being in position to be instantly operated upon when the key is depressed. The riser 20 lifts the rocker 18 in the usual manner, and this, through the connection 17, to which the jack-bed 6 is pivoted, and through the spring 16, lifts the jack-bed to the position shown in Fig. 2. This acting upon the jack, through the shoulder 8, forces the same upward, causing the hammer to strike. The hook, which

is seated in the arm 7, acts as a fulcrum on the jack, drawing the same over by pressure of the hook against the padding 3, so that the felt or padded shoulder 10 is held against the jack-catch 11 between its upper and lower flanges. The jack-catch may be regulated as to position by the screw 12, which is seated in the arm 7, providing for bringing the same nearer to the jack, if desired, as in case the shoulder 10 wears off or is through any cause diminished in size. The stop 8 on the shank of the hook 4 immediately pushes the jack back to the position shown in Fig. 1 after the key is released. The slot 2 in the jack, through which the shank of the hook 2 passes, is of sufficient length to permit a slight up-and-down movement of the jack sufficient for the striking and letting off of the hammer while the key is depressed.

It will be seen that the motion of the jack is at all times in perfect control by the different parts secured to the jack-bed 6, so that there is no uncertainty in its movement nor in its position at any time in the course of the stroke or the release of the key.

The damper 22 is operated in the usual manner by the arm 19 on the rocker.

The rebound from the string and weight of the parts is sufficient to urge the hammer back in the absence of the spring 28, and this, together with the fact that the jack is pivoted to the hammer-butt and is further in constant control by the parts attached to the jack-bed 6, renders the movement of the hammer definite and reliable without such spring.

It will be seen that the travel of my jack is much less than that of the jacks in other upright-piano actions in common use. This necessarily diminishes the friction and consequent wear on the padding or felt. In other actions having the ordinary back-catch on the rocker and the ordinary back-catch bunter on the hammer-butt there is much friction and wear on these parts.

The hook 4, stop 5, and catch 11 are all preferably adjustable, the shank of the hook being threaded and the catch 11 being secured to the member 7 by a screw, thus providing for very accurate adjustment of the parts controlling the movement of the jack.

It is plain that different parts may be attached to the arm 7 to perform the functions of the hook 4 and stop 5. I do not, therefore, confine myself to the details shown; but any parts which in like manner pull and push the jack may be substituted therefor. The shank of the hook may at times act upon the bottom of the slot to help draw down the jack. This will be important in case the pivotal action of the hammer-butt becomes imperfect. In such case the bottom of the slot 2 serves as a catch or stop on the jack and the shank of the hook 4 serves as a catch on the member 7 of the jack-bed, whereby the jack is pulled down.

I do not confine myself to the particular

form of any of the parts shown, but claim any mechanical equivalents which will perform the functions of these parts as described, referring particularly to the parts numbered 1 to 12, inclusive.

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

1. In a piano-action, a jack pivotally connected at one end, to the hammer-butt; in combination with a jack-bed having thereon a shoulder for engaging the other end of the jack; a catch or hook secured to said jack-bed, for pulling the jack forward; and a stop secured to said jack-bed for pushing the jack back with reference to said shoulder; substantially as described.

2. In a piano-action, a jack pivotally connected at one end, to the hammer-butt and having a shoulder 10 near its other end; in combination with a jack-bed having thereon a shoulder for engaging said other end of the jack; a catch or hook secured to said jack-bed for pulling the jack forward; a stop secured to the jack-bed for pushing the jack back with reference to the shoulder on the jack-bed; and a catch 11, for engaging the shoulder 10; substantially as described.

3. In a piano-action, a jack pivotally connected at one end, to the hammer-butt; in combination with a jack-bed having thereon a shoulder for engaging the other end of the jack; a catch or hook secured to said jack-bed for pulling the jack forward; a stop secured to said jack-bed for pushing the jack back with reference to said shoulder; and a rocker 18 pivotally connected to the jack-bed, for actuating the same; substantially as described.

4. In a piano-action, a jack pivotally connected at one end, to the hammer-butt and having a shoulder 10 near its other end; in combination with a jack-bed having thereon a shoulder for engaging said other end of the jack; a catch or hook secured to said jack-bed for pulling the jack forward; a stop secured to the jack-bed for pushing the jack back with reference to the shoulder on the jack-bed; a catch 11, for engaging the shoulder 10; and a rocker 18 pivotally connected to the jack-bed, for actuating same; substantially as described.

5. In a piano-action, a jack having a combined swinging and longitudinal movement, and having thereon a shoulder 10; in combination with a tilting jack-bed, independent of the jack, and having thereon a hook for pulling the jack forward, a catch for engaging the shoulder 10 at the end of the forward travel of the jack, and a stop for pushing said jack free from the catch; substantially as described.

6. In a piano-action, a jack-bed having thereon the upward extension 7 with the hook 4 and stop 5 adjustably secured thereto, substantially as and for the purposes specified.

7. In a piano-action, a jack-bed having thereon the upward extension 7 with the hook

4 and stop 5 adjustably secured thereto and the jack-catch 11 secured thereto, substantially as and for the purposes specified.

5 8. In a piano-action, a jack-bed having thereon the upward extension 7 with the hook 4 and stop 5 secured thereto, and the jack-catch 11 adjustably secured thereto, substantially as and for the purposes specified.

10 9. In a piano-action, a jack-bed having thereon the shoulders 8 and 9, and the upward extension 7 with the hook 4 and stop 5 adjustably secured thereto, substantially as and for the purposes specified.

15 10. In a piano-action, a jack-bed having thereon the shoulders 8 and 9, and the extension 7 with the hook 4, and stop 5 and jack-catch 11, secured thereto, substantially as and for the purposes specified.

20 11. In a piano-action, a jack-bed having thereon the shoulders 8 and 9, and the upward extension 7 with the hook 4, stop 5 and jack-catch 11 adjustably secured thereto, substantially as and for the purposes specified.

25 12. In a piano-action, a jack-bed having thereon the shoulders 8 and 9, and the upward extension 7 with the hook 4 and stop 5 secured thereto, substantially as and for the purposes specified.

30 13. In a piano-action, a jack-bed having thereon the shoulders 8 and 9, and the upward extension 7 with the jack-catch 11 secured thereto; in combination with a rocker 18 pivotally secured to the jack-bed, for ac-

tuating same; substantially as and for the purposes specified. 35

14. In a piano-action, a jack-bed having thereon the shoulders 8 and 9, and the upward extension 7 with the hook 4, stop 5 and jack-catch 11, secured thereto; in combination with a rocker 18 pivotally secured to the jack-bed, for actuating same; substantially as and for the purposes specified. 40

15. In a piano-action, a jack-bed having thereon the shoulders 8 and 9, and the upward extension 7 with the hook 4, stop 5 and jack-catch 11 adjustably secured thereto; in combination with a rocker 18 pivotally secured to the jack-bed, for actuating same; substantially as and for the purposes specified. 45

16. In a piano-action, a jack pivotally connected to the hammer-butt; in combination with means for imparting a longitudinal movement to the jack, in the direction of the hammer-butt; a hook or catch, independently of which, said jack is longitudinally movable, for simultaneously imparting a lateral movement to said jack; and means, independent of the hammer-butt; directly engaging the jack, at the end of said lateral movement, for limiting said longitudinal movement; substantially as described. 50 55 60

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Witnesses:

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HERMANN HEINZ.