

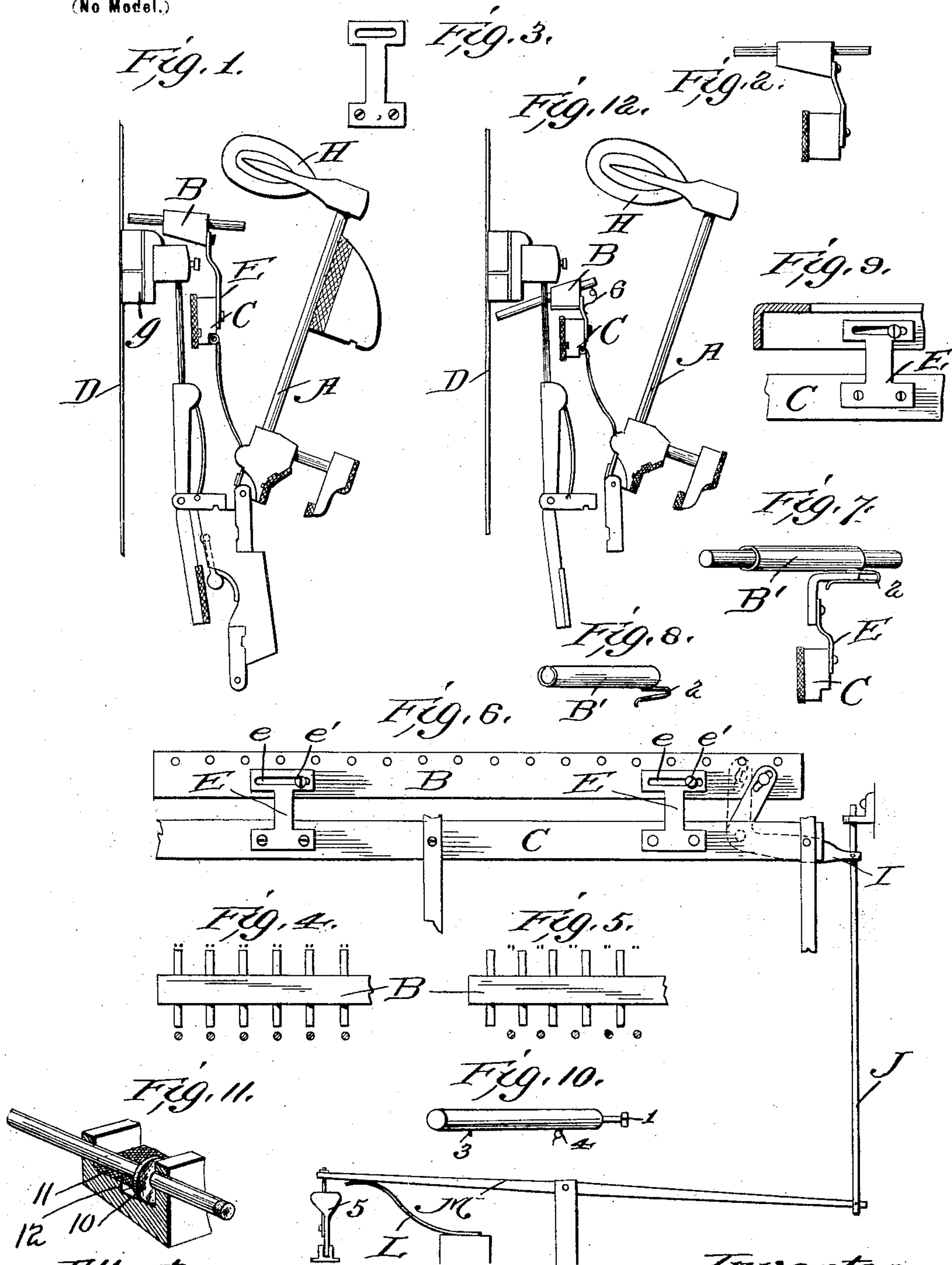
No. 637,663.

Patented Nov. 21, 1899.

C. C. POLK.
PIANO ATTACHMENT.

(Application filed May 16, 1899.)

(No Model.)



Attest
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UNITED STATES PATENT OFFICE.

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PIANO ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 637,663, dated November 21, 1899.

Application filed May 16, 1899. Serial No. 717,061. (No model.)

To all whom it may concern:

Be it known that I, CALEB C. POLK, a citizen of the United States, residing at Valparaiso, Porter county, Indiana, have invented certain new and useful Improvements in Piano Attachments, of which the following is a specification.

The object of my invention is to provide means whereby the performer may at will change the quality of tone of the piano so as to imitate the tones produced by the harp, mandolin, banjo, and other stringed instruments.

It is the object of my invention to provide a simple attachment to the ordinary pianos for accomplishing the object, said attachment being thrown into and out of use as desired by a simple manipulation of a pedal or like device by the performer.

It is my object to provide such an attachment as will not interfere in any way with the ordinary piano-action, but will coöperate with the hammers thereof to produce the desired quality of tone.

In the accompanying drawings, Figure 1 is a side view of an ordinary piano-action with my improvement in place. Fig. 2 is an enlarged view of part of the attachment. Fig. 3 is a detail view of a supporting-arm forming part of the attachment. Figs. 4 and 5 are detail plan views showing different positions of the hammer-shanks and pistons relative to each other. Fig. 6 is a front view of the attachment. Figs. 7, 8, and 9 are detail views of a modification. Fig. 10 is a view of one of the pistons. Fig. 11 is a modification. Fig. 12 is a modification.

In the drawings, A represents the hammer-shank, H the hammer, C the hammer spring-rail, and D the piano-strings, these parts being of any ordinary form common to upright pianos.

My improvement consists of a carrier-rail B, extending transversely in front of the strings and preferably above the dampers *g* and below the plane of the hammers. This carrier-rail is supported from the hammer spring-rail C by arms E, having slots *e*, through which pass screws *e'*, carried by the rail B. This rail is provided with a series of holes along its upper edge, and through

these holes a series of pistons extend, one for each string. These pistons are intended to be driven forward by contact with the hammer-shanks at the same time that the hammers strike the strings. The pistons are shorter than the distance between the hammer-shanks and the ends of the hammer, and by reason of this the pistons are not pressed against the strings by a continuous contact with the hammer-shanks, but the hammer-shanks simply impel the pistons forward, and the said pistons therefore strike the strings by reason of their own momentum, and this striking action takes place simultaneously with the stroke of the hammer. By reason of the fact that the pistons are simply given an impulse to strike and at the moment of striking the strings are not in contact with or pressed upon by the hammer-shanks a quality of tone is produced closely resembling that of the harp or mandolin. The pistons are free to move backwardly after striking the strings, the strings are left free to vibrate, and the resonant quality of the tone is not detrimentally affected. As shown in Fig. 1, the pistons incline upwardly toward the springs, and they are therefore free to fall or slip back readily after striking the strings, being aided in this action by gravity.

As shown in Fig. 10, I fit the pistons with adjustable screws 1, by which the length of the piston may be varied to suit different conditions. In this figure a spring is shown at 4, which is designed to keep the piston retracted from the piano-string. This spring rests, when the parts are in proper relation, against the clasp 2, Fig. 7. A stop projection 3 on the piston limits its backward movement under the action of the vibrating piano-string. The head of the screw 1 may be cushioned with a soft material, so as to prevent any noise due to the impact of the hammer-shank. The piston may be covered with cloth, or the opening through which it passes may be lined with cloth or felt, so as to prevent any noise in the action of the parts.

In Figs. 1 and 6 the carrier-rail B is shown as a bar having openings through it for the pistons, while in Figs. 7 and 9 this carrier-bar is in the form of an angle-bar and is made in one piece of tin, steel, brass, or other metal.

This leaves an overhanging edge, upon which the carrier-tubes B' are supported by spring-hooks thereon engaging the overhanging edge or flange. The angular rail of Fig. 7 is supported from the hammer spring-rail C by means of the arms E, before described. By means of these carrier-tubes B' and their spring-hooks 2 the said tubes may be set or adjusted along the carrier-rail so as to suit different makes of pianos having the hammer-shanks at different distances apart.

In order to place the attachment into and out of operative position, a pedal 5 is employed, connected with the lever M, which in turn is connected through the rod J and lever I with the carrier-bar B, as shown in Fig. 6. A spring L presses the lever M, so that the carrier-bar will be normally in the position of Fig. 5 relatively to the hammer-shank. By pressing upon the pedal the carrier-bar will be shifted longitudinally to the position of Fig. 4, so that the pistons will lie directly in the paths of the hammer-shanks to be projected forwardly thereby.

It will be seen from the above that I obtain two different qualities of tone, one from the hammer-head and one from the piston, at the same blow of the hammer. These tones combined produce the effect desired in imitation of the harp or mandolin, and while the piston derives its force or momentum from the hammer-shank its blow is delivered independent of this shank, and the effect produced is that of independently-operated parts—i. e., the hammer and piston striking the strings simultaneously. As before stated, the piston when impelled by the hammer has freedom of movement, and being shorter than the distance between the hammer-shank and string it offers no obstructions whatever to the blow of the hammer, and the ordinary effect or action of the hammer is not interfered with, nor does it require any additional effort on the part of the performer. The piston strikes the string while it is vibrating from the blow of the hammer, and the tone produced by this blending with that produced by the hammer gives the desired effect.

Referring to Fig. 12, the piston may be arranged so that its front end will be the lowest. In this form a spring 6 is employed to keep the piston back from the string. This figure shows also that the pistons may be arranged below the dampers instead of above them.

Fig. 11 shows a felt collar 10 on the piston, the lower edges of which bear on the strip 11 of felt, which is held in place in the carrier-rail B. By this arrangement the resilience or flexibility of the felt parts acts to return the pistons to normal position when projected against the strings. I do not limit myself to felt as the material from which the collars and strip are made. The edge of the strip or felt projects beyond the shoulder 12.

I claim as my invention—

1. In combination in a piano, the strings, the hammers and their shanks, means for

striking the strings simultaneously with the hammers, said means being operated by the hammer mechanism and having movement both toward and from the strings, the retracting movement being permitted irrespective of the retraction of the hammer, a shifting support for said striking means to disalign or align the same with the strings and means for shifting the said support, substantially as described.

2. In combination in a piano, the strings, the hammers and their shanks, and means for striking the strings simultaneously with the hammers, said means being operated by the hammer mechanism and having movement both toward and from the strings, the retracting movement being permitted irrespective of the retraction of the hammer, substantially as described.

3. In combination with the piano-strings, the hammers, a series of sliding pistons acting by their own momentum against the strings and simultaneously with the hammers, said sliding pistons being free to retract from the strings irrespective of the positions of the hammers, substantially as described.

4. In combination, the strings, the hammer, and a series of devices to strike the strings under their own momentum simultaneously with the hammers, said devices being operated by the hammer-shanks or a part of the hammer, substantially as described.

5. In combination, the strings, the series of pistons of shorter length than the distance between the hammers' shanks and the strings when the hammers are in contact with the strings, said pistons being operated by the hammer-shanks, substantially as described.

6. In combination in a piano, the strings, the hammers and their shanks, means for striking the strings simultaneously with the hammers, said means being operated by the hammer mechanism and having movement both toward and from the strings, the retracting movement being permitted irrespective of the retraction of the hammer, a hammer spring-rail, a shifting support for said striking means to disalign or align the same with the strings, said support being carried by the hammer spring-rail and means for shifting said support, substantially as described.

7. In combination, the strings, the hammers, the pistons for striking the strings simultaneously with the hammers, the support for the pistons, the hammer spring-rail and the means for connecting the support with the hammer spring-rail, the said pistons being operated by the hammer-shanks and being shorter than the distance between the shanks and the strings when the hammers are against the strings, substantially as described.

8. In combination, the strings, the hammer, a series of pistons to strike the strings for producing tones of a different quality from those produced by the hammers, supporting means for said pistons extending transversely

of the strings and means for shifting the said supporting means transversely of the strings, said pistons being shorter than the distance between the strings and the hammer-shanks when the hammers are against the strings, substantially as described.

9. In combination, the strings, the hammers with their shanks, a series of pistons, a carrying-rail therefor extending transversely of the strings, the hammer spring-rail, slotted arms connecting the hammer spring-rail with the carrying-rail and a pedal with connections to the carrying-rail for shifting the same longitudinally, said pistons being shorter than the distance between the strings and the hammer-shanks when the hammers are against the strings, substantially as described.

10. In combination, the strings, the hammer, and a series of pistons inclining up-

wardly toward the strings and arranged to be projected thereagainst by the hammer-action, said pistons acting by their own momentum and being free at all times to retract from the strings, substantially as described.

11. In combination with the strings, the hammer, the pistons arranged to retract independently of the retraction of the hammer and resilient means for positively retracting the pistons, said pistons being shorter than the distance between the hammer-shanks and strings when the hammers are against the strings, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CALEB C. POLK.

Witnesses:

WELLINGTON HUNTINGTON,
CHARLES SUMMERS.