F. CLUTSAM.

PIANOFORTE ACTION.

APPLICATION FILED MAY 15, 1916.

1,301,908.

Patented Apr. 29, 1919.

3 SHEETS—SHEET 1.

Fig. 1.

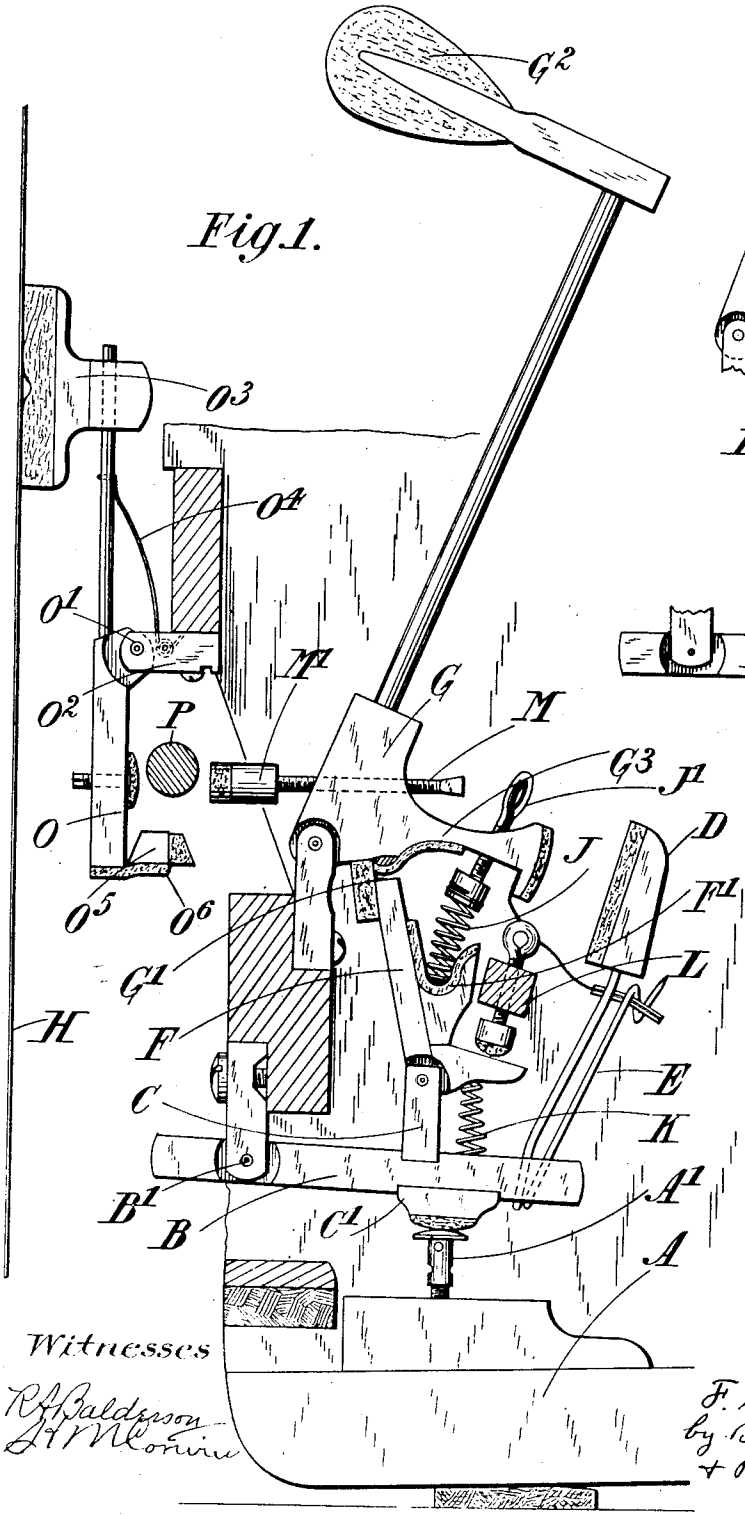
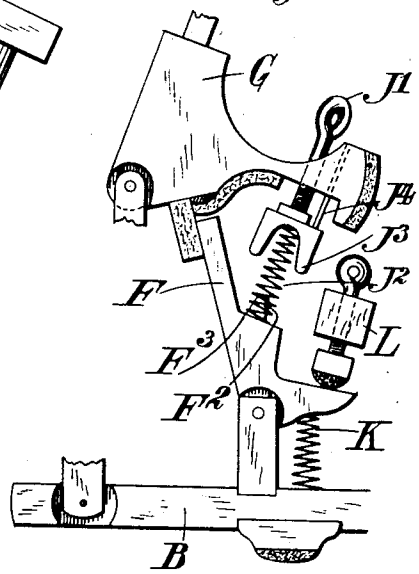


Fig. 4.



Witnesses

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3 SHEETS—SHEET 2.

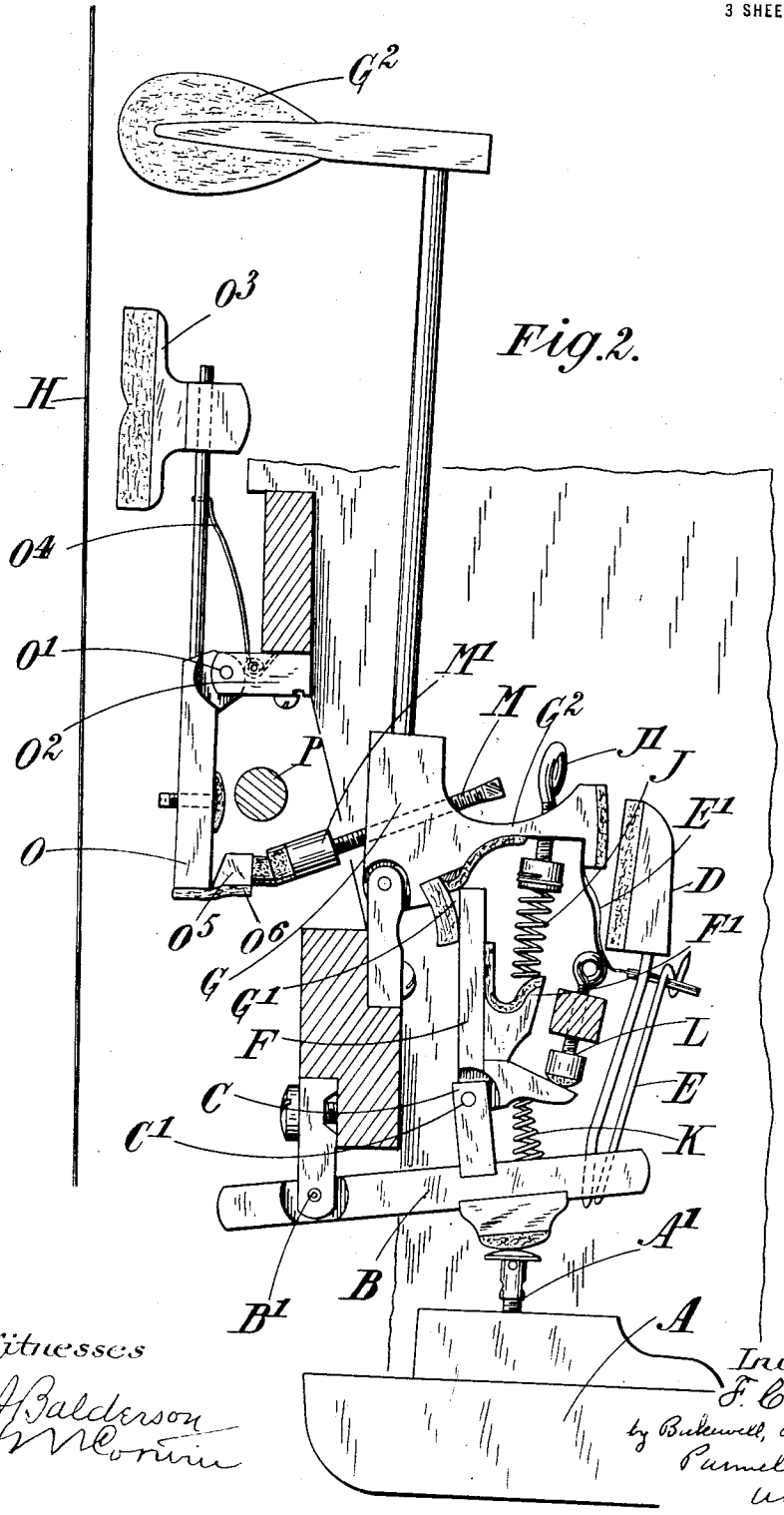


Fig. 2.

Witnesses

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3 SHEETS—SHEET 3.

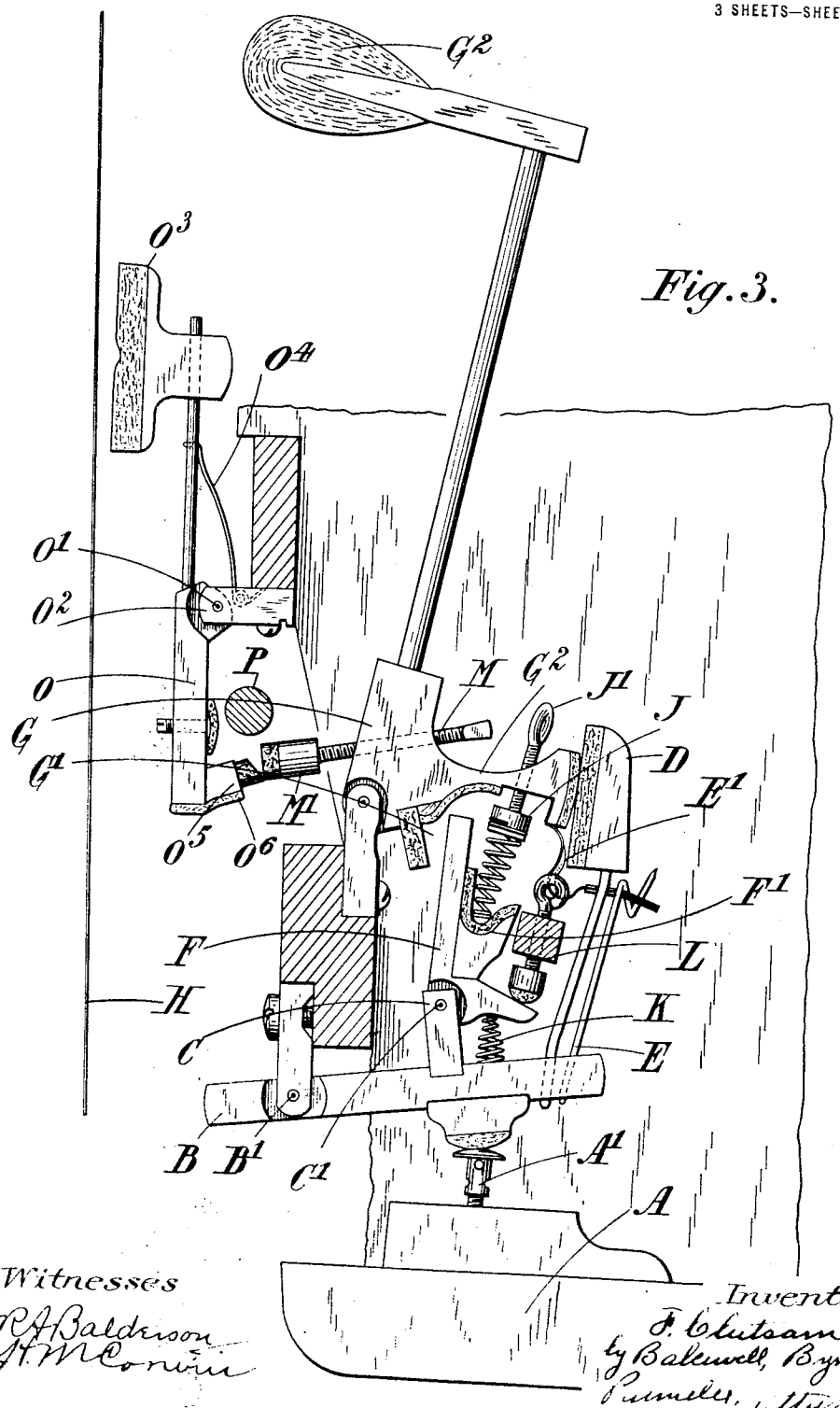


Fig. 3.

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UNITED STATES PATENT OFFICE.

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PIANOFORTE-ACTION.

1,301,908. Specification of Letters Patent. Patented Apr. 29, 1919.

Application filed May 15, 1916. Serial No. 97,466.

To all whom it may concern:

Be it known that I, FREDERICK CLUTSAM, a subject of the King of England, residing in London, England, have invented certain new and useful Improvements in Pianoforte-Actions, of which the following is a specification.

This invention relates to an improvement in upright pianofortes. The object of this invention is to provide means whereby a resilient force shall be applied between the hammer and the jack in such a way that the direction of the said force shall, in the first portion of a movement of striking a note, tend to throw the jack into the customary notch in the hammer-butt and shall subsequently change its direction so as to tend either to throw the jack out from the notch, or at least be neutral as to its tendency to throw the jack relatively to the notch. The parts are so arranged that if the blow has been a light one the said resilient force tends, at the completion of the stroke, to throw the jack out, but if the blow has been heavier, the direction of the said resilient force is neutral at the completion of the stroke, that is to say, it does not tend to throw the jack either way.

The precise nature of my invention will be best understood by reference to the accompanying drawings, which will now be described, it being premised, however, that various changes may be made in the details of construction and the general arrangement of the parts, without departing from the spirit and scope of my invention as defined in the appended claims.

In the accompanying drawings I have shown my improvement in several forms, and in which:

Figure 1 is a side elevation of one form of my device showing the hammer in its position of rest, or in the retracted position.

Figs. 2 and 3 are similar views showing the action in different positions assumed during the movement of the key, and

Fig. 4 is a similar view of a portion of the device showing a modified form of action.

In these drawings the reference character A designates the key, and connected to the rear end thereof is an adjustable action capstan screw A′, which is adapted to engage a felted portion on the wippen B. This wippen B is pivotally connected to a wippen flange at B′, and which wippen flange is connected to the usual large action rail. C is the jack flange, which is connected to the wippen B, and pivotally connected to the jack flange at C′, is a jack F, having an upward extension for engaging the hammer butt, as hereinafter described, and also a recess F′ for the reception of the resilient actuating member J for the hammer.

Pivotally connected to a butt flange connected to the large action rail is a hammer butt G to which the hammer G^2 is connected by means of the usual hammer shank. The hammer butt G is also provided with a counter-check G^3, having a notch G′ in the bottom thereof, which is engaged by the upper end of the jack F. Passing through the counter-check G^3 is an adjusting screw J′, and connected to a head on this screw is the resilient actuating member J which is arranged to be seated in the recess F′ in the jack F when the hammer is in its retracted position.

Connected to the outer end of the wippen B is a bridle wire E, and E′ is the bridle connected to the upper end of this wire and the counter-check of the hammer butt. D is the hammer check connected to the end of the wippen by means of a rod and which is arranged to be engaged by the back-stop on the counter-check. H designates one of the piano wires, and O^3 the damper head, which is connected to a damper wire extending upwardly from the upper end of the damper lever O. This damper lever O is pivoted at O′ to a damper rail O^2 which is connected to the main action rail of the piano, and is maintained in its proper position by means of the damper spring O^4. Connected to the lower end of the damper lever O by means of a piece of felt O^6 is the member O^5, which is arranged to be struck by the adjustable damper lifter M′ on the end of a screw M passing through the hammer butt in the usual manner. P designates the damper rod which is actuated by the damper pedal for retaining the damper levers O out of contact with the strings H.

L is the regulating rail, in which is secured a regulating screw having an abutment on the end thereof adapted to be engaged by one arm of the jack to positively pull the jack out of the notch G′ after the hammer has been moved a predetermined distance when striking a note, and K is a

spring interposed between one arm of the jack and the wippen.

The operation of the device is as follows: When a key is struck, the hammer will first be raised by the resilient action of the spring J, and as soon as the end of the jack F engages the upper wall of the notch G' the hammer butt will be positively actuated by the jack. During this first movement of the hammer butt the spring J will tend to hold the jack F in engagement with the wall of the notch, but after the jack has moved a short distance the spring will tend to move the jack out of the notch, so that when the one arm of the jack engages the capstan-screw the spring will tend to retain the jack in this position. When the key is released the parts will assume the position shown in Fig. 1, in which position the hammer and butt will be resiliently supported by the spring J.

If the key has been struck softly the parts will take the positions in which they are shown in Fig. 2, where the hammer is shown as having rebounded from the string. It will, therefore, be seen that the hammer is being held by the jack F and the spring J jointly, the jack having partially left the notch and the spring J having left the bottom of the crotch F' and having been caught by the right-hand crest of the crotch wall. Obviously the precise positions will depend upon the degree of hardness with which the note has been struck; for a wide range of strengths, the spring J will engage with the right-hand wall of the crotch F' and so be tending to bring the jack F out of its notch. If the note be struck hard the hammer will rebound into check, as seen in Fig. 3, so that the check D is in contact with the counter-check G^2 and the spring J is again resting in the bottom of the crotch F', but in such a position that it exerts substantially a straight downward thrust with little or no lateral component which would tend to determine the position of the jack F. If, after the key has been struck hard, it is released, the weight of the hammer is first taken by the spring J, and then as the tail of the key-lever drops and the whippen B follows it, the spring K first tends to throw the jack into its notch and as this action proceeds the spring J somewhat suddenly begins to assist the spring K.

In Fig. 4 I have shown a construction somewhat similar to that shown in the other figures of the drawings and to which I have applied the same general reference characters, but in this construction the spring F^3 is seated on a pin or projection F^2 on the jack F. The upper end of this spring is seated in a recess in a member J^3 which is adapted to slide on a guide member J^4 and which is arranged to be adjusted by means of a screw J'.

The advantages of my invention result from the provision of a resilient supporting and preliminary actuating member between the jack and the hammer-butt, so disposed that the line of its thrust varies with the position of the parts in such a way that during the striking of a note the action first tends to throw the jack into the notch in the hammer-butt, but subsequently tends either to throw it out or has no action to throw the jack either in or out of its notch.

I claim:

1. An upright piano action, comprising a hammer having a butt, a jack arranged to engage the butt and actuate the hammer, a counter-check projecting rearwardly from the hammer butt over the jack, a projection on the rear side of the jack, and a resilient compression member between the counter-check and said projection on the jack, the line of thrust passing between the pivotal support of the jack and the pivotal support of the hammer when the parts are not in use, and passing onto that side of the jack which is remote from the hammer when a note has been struck and the jack is in check, substantially as described.

2. An upright piano action, comprising a hammer having a butt, a jack arranged to engage the butt and actuate the hammer, a counter-check projecting rearwardly from the hammer butt over the jack, a projection on the rear side of the jack, and a spring between the counter-check and the side projection of the jack, the spring being so situated that its line of thrust passes between the pivotal support of the jack and the pivotal support of the hammer to hold the jack in striking relation to the hammer butt, when the jack is first elevated to move the hammer, the thrust of the spring being shifted after the first part of the movement of the jack so as to exert its pressure to withdraw the jack from the hammer butt during the latter part of the movement of the jack, substantially as described.

3. An upright piano action, comprising a hammer having a butt, a jack arranged to engage the butt and actuate the hammer, a counter-check projecting rearwardly from the hammer butt over the jack, a recessed projection on one of said members, and a spring on the other member engaging the walls of said recess, the line of thrust of the spring when the parts are not in use passing between the pivotal support of the jack and the pivotal support of the hammer to hold the jack in striking relation to the hammer butt, said spring being arranged to engage various portions of the wall of the recess when the jack is held in its elevated position to hold the jack from striking position, substantially as described.

4. An upright piano action, comprising a hammer having a butt, a jack arranged to engage the butt and actuate the hammer, a

wippen for supporting the jack, a key for actuating the wippen, a spring interposed between the jack and the wippen for holding the jack in striking position, a capstan screw arranged to be struck by the jack to move the jack out of striking engagement with the hammer butt, a counter-check projecting rearwardly from the hammer butt over the jack, a projection on the rear side of the jack having a recess therein, and a spring connected to the counter-check seated in the bottom of the recess when the parts are not in use, and assisting the other spring to retain the jack in striking relation to the hammer butt, substantially as described.

FREDERICK CLUTSAM.

Witnesses:
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