

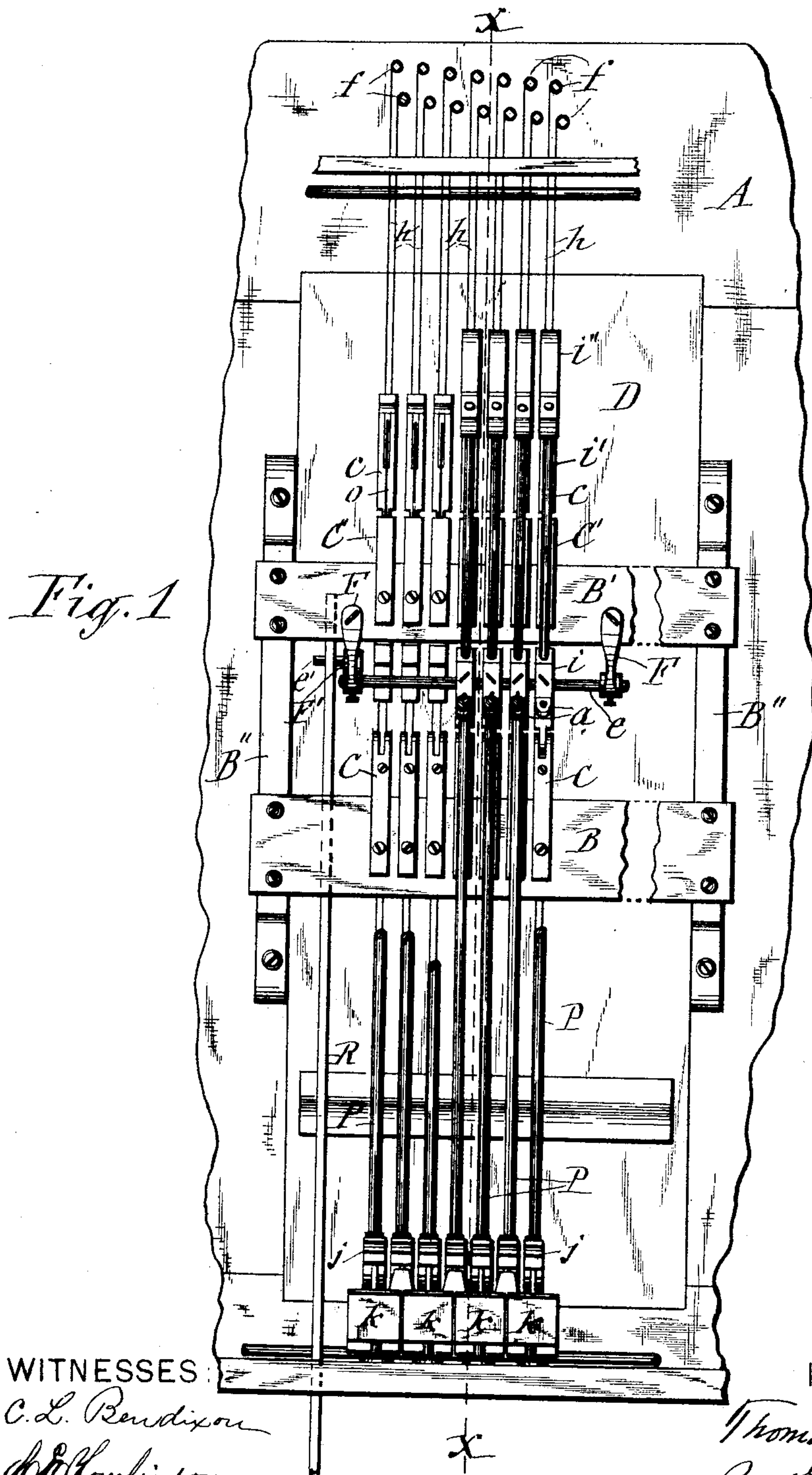
(No Model.)

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PIANO KEY ACTION.

No. 538,079.

Patented Apr. 23, 1895.



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INVENTOR:

Thomas H. Knollin  
By E. Laase  
his ATTORNEY

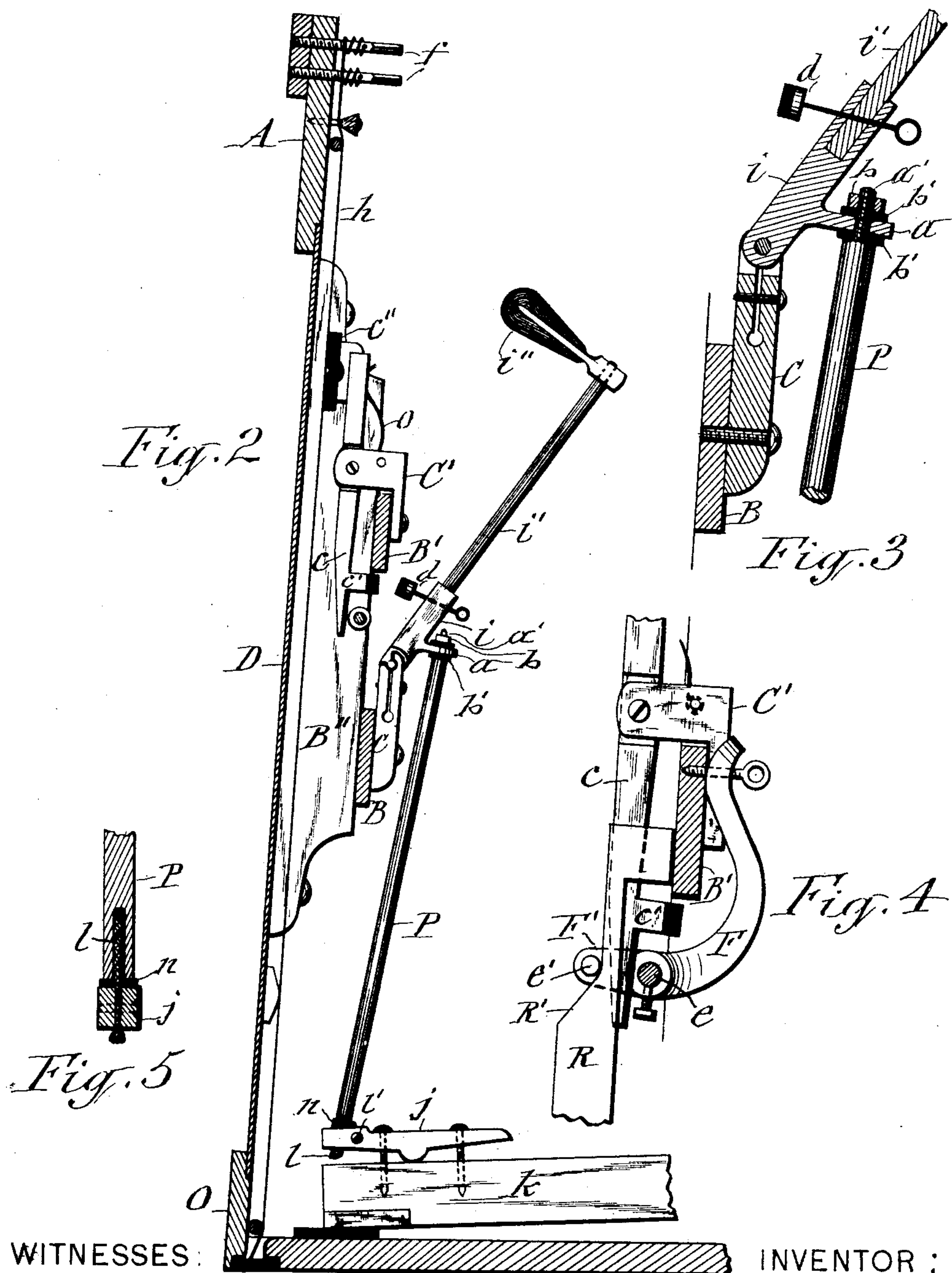
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# UNITED STATES PATENT OFFICE.

THOMAS H. KNOLLIN, OF SYRACUSE, NEW YORK.

## PIANO KEY-ACTION.

SPECIFICATION forming part of Letters Patent No. 538,079, dated April 23, 1895.

Application filed January 12, 1895. Serial No. 534,620. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS H. KNOLLIN, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Piano Key-Actions, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention is designed for upright pianos, and the object of the invention is to provide such pianos with actions of the utmost simplicity and durability; and to that end the invention consists in the improved construction and combination of the constituent parts of the action as hereinafter described and specifically set forth in the claims.

In the annexed drawings Figure 1 is a front elevation of a piano-action embodying my improvements, some portions being broken away to better illustrate the details. Fig. 2 is a vertical transverse section on line —X—X— in Fig. 1. Fig. 3 is an enlarged detail view of the connection of the abstract to the hammer-butt. Fig. 4 is a detail view of the means for transmitting motion from the pedal to the damper, and Fig. 5 is a detail view of the connection of the abstract with the key.

Similar letters of reference indicate corresponding parts.

—A— represents the so-called wrest-plank to which are attached the tuning pins —f—f—. —h—h— denote the piano-strings which are at one end attached to said pins and at the opposite end to the base —C— in the usual manner.

—D— represents the usual sound-board.

Transversely in front of the strings and a short distance therefrom are two cross-bars —B—B'— preferably of suitable metal and rigidly secured to suitable parts —B''— of the frame. Said bars are arranged one beneath the other and form separate supports for the damper and hammer to allow either to be detached without disturbing the other.

To the lower bar —B— are fastened the hammer-butt flanges —C—C— to which are hinged the hammer-butts —i—i— formed with the usual sockets in which the shanks —i'— of the hammers —i''— are secured.

—k—k— represent the piano-keys to the top of the inner end of each of which is se-

cured the usual adjustable rocker —j— as shown in Fig. 2 of the drawings.

The key is made to transmit motion direct to the hammer by means of the abstract —P— which is connected at one end to the aforesaid rocker and at the opposite end to a lug —a— projecting from the hammer-butt —i—.

In order to permit ready access for renewing strings —h—h— when required, I make the abstract detachable from the lug —a—, preferably by securing to the upper end of the abstract an upwardly projecting metallic pin —a'— which is screw-threaded on its free end and passes through an eye in the lug —a—.

Between the upper end of the wooden or main portion of the abstract and under side of the lug, I interpose a suitable cushion —b'— and also place upon the top of the lug a similar cushion and apply to the end of the pin —a'—, a nut —b— which is screwed down to the subjacent cushion. By removing said nut and tilting the hammer —i''— toward the strings, the pin —a'— is withdrawn from the lug —a— and the abstract —P— is then allowed to be swung with its upper end forward and out of the way.

The purpose of the aforesaid cushioned connection of the abstract to the hammer-butt is to prevent a secondary stroke of the hammer upon the strings. The upward thrust of the abstract is limited to carry the hammer to within a short distance from the strings and from thence the momentum of the hammer causes it to strike the strings, the elasticity of the cushion on top of the lug —a— allows the latter action of the hammer and causes it to immediately recede from the strings.

To permit the necessary rocking motion of the abstract —P— upon the key, I connect said abstract to the rocker —j— hereinbefore mentioned, by providing the latter with a vertical slot and fasten to the lower end of the abstract a cord —l— which passes through the slot of the rocker and is fastened therein by a screw —l'— inserted transversely in the rocker as shown in Fig. 5 of the drawings. The abstract rides upon the rocker and between them is interposed a cushion —n—.

To the upper cross-bar —B'— are fastened the brackets —C'— usually termed damper-flanges, to which the damper-levers —c— are



fulcrumed. Said flanges project toward the strings to allow the damper-levers to rock behind the bar —B'—. Each of these levers is provided on its lower end with a forwardly projecting heel —c'— and facing this is the buffer —d— secured to the hammer-butt —i— so as to cause said buffer to come in contact with the heel —c'— and thereby tilt the lever —c— so as to remove the damper —c''— from the string or strings —h— simultaneously with the blow of the hammer.

The damper is held normally in contact with the strings by means of a suitable spring —o— attached to the flange —c'— and bearing with its free end on the front of the upper end of the lever —c—.

It will be observed that the aforesaid organization of the action combines maximum simplicity and compactness in construction with durability in operation.

For throwing the dampers —c''—c''— out of contact with the strings —h—h— by means of the usual pedal, I employ oscillatory hangers —F— suspended from the cross-bar —B'— and carrying by their lower ends the rod —e— which extends across the lower ends of the damper-levers —c—c—. One of said hangers is formed with a rearward extension —F'— from the side of which projects a lug or pin —e'— across the front of which extends the upper end of the pedal-rod —R— which bears on the back of the cross-bar —B— and is provided with an inclined shoulder —R'— immediately beneath the lug —e'— so as to cause the pedal-rod when pushed up by the pedal, to swing the hanger —F— rearward by the engagement of the inclined shoulder —R'— with the lug —e'—, whereby the rod —e— carried by the hangers is pushed against the

lower ends of the damper-levers which are thereby caused to throw the dampers —c''— from the strings.

Having described my invention, what I claim is—

1. The combination of the stationary supporting bar —B—, flange —C— attached to said bar, the hammer-butt —i— hinged to said flange, the perforated lug —a— projecting from said butt, the abstract —P— having the screw-threaded stem —a'— passing through said lug, the nut —b— on the end of said stem, cushions —b'—b'— on top and bottom of the lug, and the lower end of the abstract connected to the key as set forth.

2. The combination with the key and rocker —j— attached thereto the abstract —P— riding on said rocker, a cord attached to the abstract and passing through a slot in the rocker, a screw inserted in the rocker and retaining the cord therein, and a cushion interposed between the abstract and rocker substantially as described and shown.

3. In combination with the damper-lever —c— and stationary cross-bar —B'—, the vibratory hangers —F—F— suspended from said cross-bar, the rod —e— carried by said hangers the lug —e'— projecting from the hanger, and the pedal-rod —R— guided on the cross-bar and provided with the inclined shoulder —R'— engaging the aforesaid lug as set forth.

In testimony whereof I have hereunto signed my name this 31st day of December, 1894.

THOMAS H. KNOLLIN. [L. S.]

Witnesses:

J. J. LAASS,

C. L. BENDIXON.