2. Sheets. Sheet. 1.

W. Bourne,

Piano Action.

No. 104,256. Patented June 14. 1870.

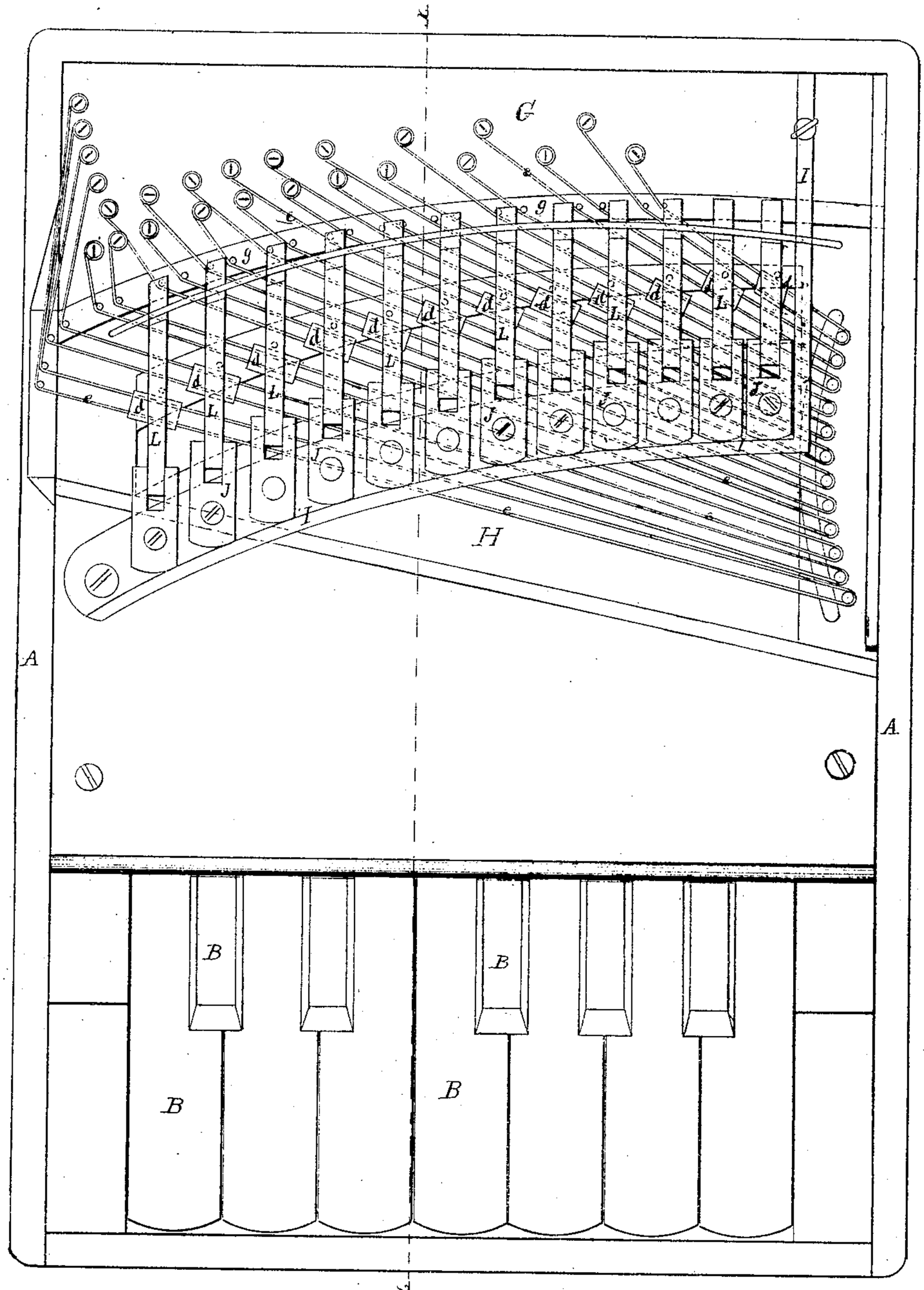

Fig. 1

WITNESSES.

N. C. Lombard

D. D. Whitney

INVENTOR.

William Bourne

2. Sheets. Sheet. 2.

W. Bourne,

Piano Action.

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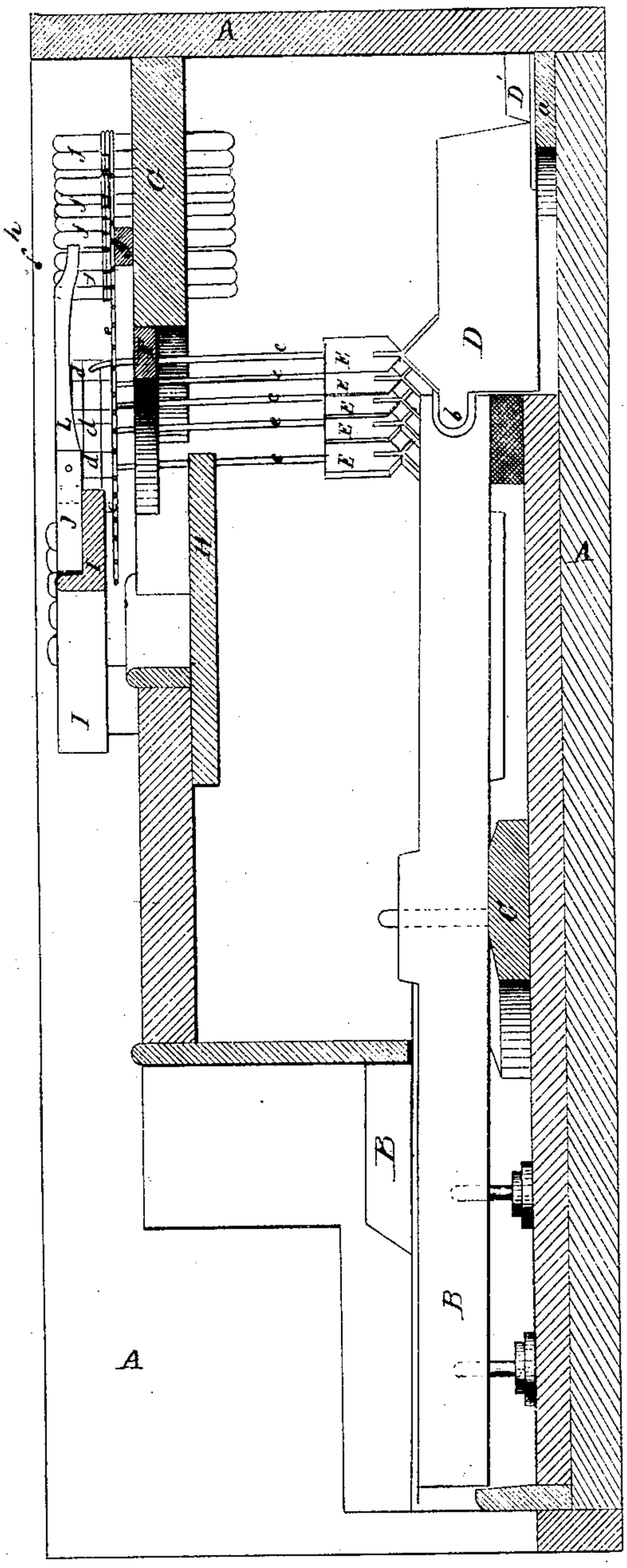

Fig. 2.

WITNESSES.

N. C. Lombard

G. O. Whitney

INVENTOR.

William Bourne

United States Patent Office.

WILLIAM BOURNE, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO HIMSELF AND NATHANIEL CUMMINGS, OF SAME PLACE.

Letters Patent No. 104,256, *dated June* 14, 1870.

IMPROVEMENT IN PIANO-FORTES.

The Schedule referred to in these Letters Patent and making part of the same

I, WILLIAM BOURNE, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Piano-Fortes, of which the following, taken in connection with the accompanying drawing, is a specification.

Nature and Objects of the Invention.

My invention relates to the "damper" by which the vibration of the string is checked when the finger is removed from the "key," and its object is to remedy many of the objections to the present "over" or "upper damper," so called, of the class in which long wooden levers or arms are arranged above the strings, to the lower edge of which are secured the damper-pads or cushions, said levers, with the damper-pads, being lifted by a small wire under their back ends, the lower ends of which rest upon the back ends of the keys.

In all "over dampers" of this class heretofore constructed, so far as my knowledge extends, the upper levers have been made long, extending back nearly to the tuning-pins, and their back ends rest upon felted buttons upon the top of small wire rods, called "damper-lifters," said wires passing through holes in the iron frame and the pin-block, and resting upon the back end of the key, but having no positive connection therewith.

The holes for the bearings of these wires have to be lined with cloth, and, as the pin-block is from two to three inches thick, of hard wood, it is quite a difficult and expensive job to bore the holes and line them properly, and, when done, a very slight bend in the lifter-wire will cause it to stick and become inoperative.

These lifter-wires not being connected to the key, but their lower ends simply resting upon the upper surface of the keys, or suspended above the keys with their lower ends raised a little above the tops of the keys, they are very liable to rebound when the key is struck, conveying an unpleasant sensation to the operator, and it therefore becomes necessary to load the levers with lead to prevent the rebound, but this does not entirely remedy the evil.

Another objection to this class of damper, as now constructed, is that the upper levers, extending back so near to the tuning-pins, interfere very much with the tuning of the piano, and, as the damper-pad is secured permanently upon said levers, they cannot be removed without removing the damper-pads, in which state the piano cannot be tuned properly.

Another objection is that the damper-lifters are very liable to be disarranged and become inoperative, by being bent in drawing out and replacing the action. Again, that portion of the key in the rear of the pivot has to be made so long that they are much more liable to spring and get out of place, and cause the lifters to interfere or become inoperative, and the extra weight of this long arm of the key makes the action heavy to the touch, and necessitates loading the front end of the key with an extra amount of lead to counterbalance the same.

Another objection is that, owing to the damper-levers having no positive connection with the keys, they have to be so adjusted that their lower ends will not quite reach the upper surface of the keys, (to guard against or to reduce the liability of accident to them in drawing out and replacing the action,) the result of which is that the keys have to move a short distance before they come in contact with the lifters, and then the lifters move a short distance before the buttons on their upper ends come in contact with the upper levers, so that the keys have to make three distinct movements or starts when struck by the operator.

Also, when using the loud pedal, the whole weight of the damper-levers is removed from the keys, thus making the action much lighter, and consequently, greatly impairing the power, quickness, and return of the action.

Another kind of over damper, called the "grand damper," is in use, in which the upper damper-levers are dispensed with, and the damper-pads are secured directly to the top of the damper-lifters, the lower ends of which are so connected to the keys as to partake of the positive motion of the keys, which is an improvement upon the damper first mentioned, in many respects; but, owing to dispensing with the upper levers, the damper-pad is liable to vibrate with the string, and produces a singing sound which is very objectionable.

I have discovered by actual test that the application of a short upper damper-lever to the "grand-damper," the said levers resting upon the damper-pads, but not secured thereto, will remedy all of the objections mentioned as applicable to both kinds of dampers described; and my invention consists in the application to the "grand damper" of a series of short wooden levers, secured by a hinge-joint to a light frame and resting upon the damper-pad, the damper-pad being secured directly to the upper end of the damper-lifter, as now used in the "grand damper."

Description of the Drawing.

Figure 1 is a plan of an instrument on a small scale, illustrating the application of my improvement.

Figure 2 is a section on line *x x* on fig. 1.

The same letters refer to the same parts in both of the figures.

General Description.

A is the case of the instrument;

B, the key; and

C, the key-rail.

D is the under damper-lever hinged to the block D′, secured to the under damper-frame *a*.

The key B has a groove or fork formed in its rear end, into which the tongue *b*, formed upon the forward end of the under damper-lever D, fits, as shown.

To the upper side of the under damper-levers D are hinged the damper-buttons or blocks E, in the top ends of which are secured the damper-lifters *c c*, which have bearings in sockets formed in the thin plate F, placed in front of the pin-block, and near where the hammer strikes the string.

To the upper ends of said damper-lifters are secured the damper-pads *d*, which rest upon the strings *e*.

G is the pin-block;

f, the tuning-pins;

g, the bridge; and

H, the sounding-board.

I is a light wooden frame placed above the strings, to which are secured, by screws, the flanges J, to which are hinged the upper damper-levers L, so as to rest upon the damper-pads *d*.

h is the stop-rail to limit the upward movement of the upper damper-levers L.

The operation of my improved damper is as follows:

When the front end of the key is depressed by the touch of the operator's finger, the front end of the under damper-lever is raised, and the damper-pad is lifted from the string before the hammer strikes it, and raises the upper damper-lever at the same time by its contact therewith. When the key starts, the under damper-levers, the damper-lifters, and the upper damper-levers all move in unison therewith, the same weight being upon the key all of the time. When the finger is removed from the key its rear end falls, carrying with it the under damper-levers, the damper-lifters, and the damper-pads, the pads falling upon the strings, and the upper damper-lever, falling with the pad, serves to keep the pad still after it strikes the string, and effectually prevents the singing sound which is so objectionable in the grand damper.

The upper damper-levers, and the frame to which they are secured, may be readily removed without disturbing the damper-pads, so that the piano may be as readily and easily tuned as when the grand damper is used.

Claim.

Having thus described the construction and operation of my improvement,

What I claim as new, and desire to secure by Letters Patent of the United States, is—

The upper damper-levers L, constructed, arranged, and operating as herein set forth, in combination with the damper-pads *d*, secured directly to the upper ends of the damper-lifters *c c*, and operating by a positive connection with the key, substantially as described.

Executed at Boston this 27th day of April, 1870.

WILLIAM BOURNE.

Witnesses:

N. C. LOMBARD,

G. E. WHITNEY.