

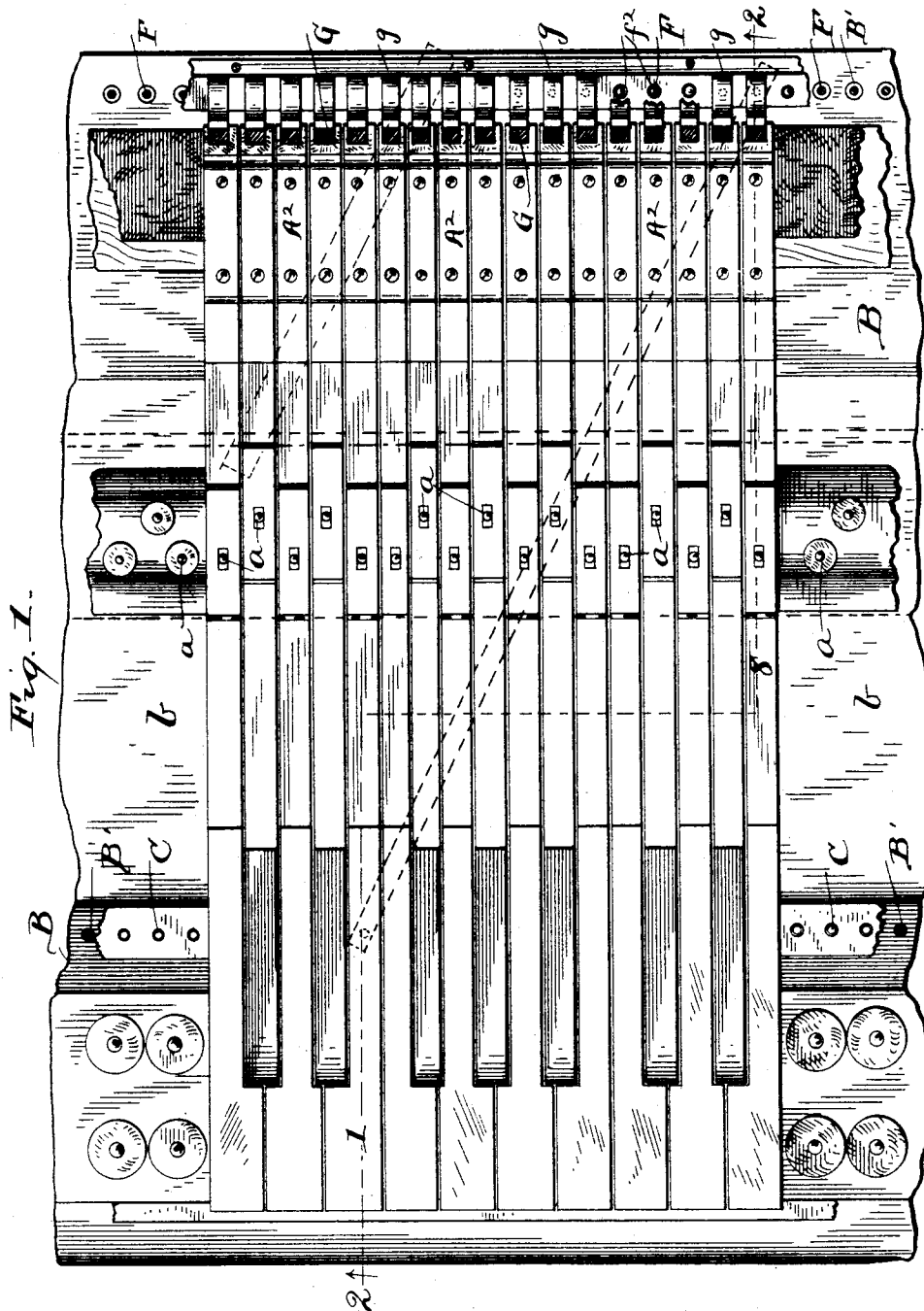
(No Model.)

3 Sheets—Sheet 1.

H. R. MOORE.
PIANOFORTE.

No. 539,630.

Patented May 21, 1895.



Witnesses.

E. Byron Gilchrist
Clermont

Inventor:
Hartwell R. Moore
By Siggett & Siggett
his attorneys.

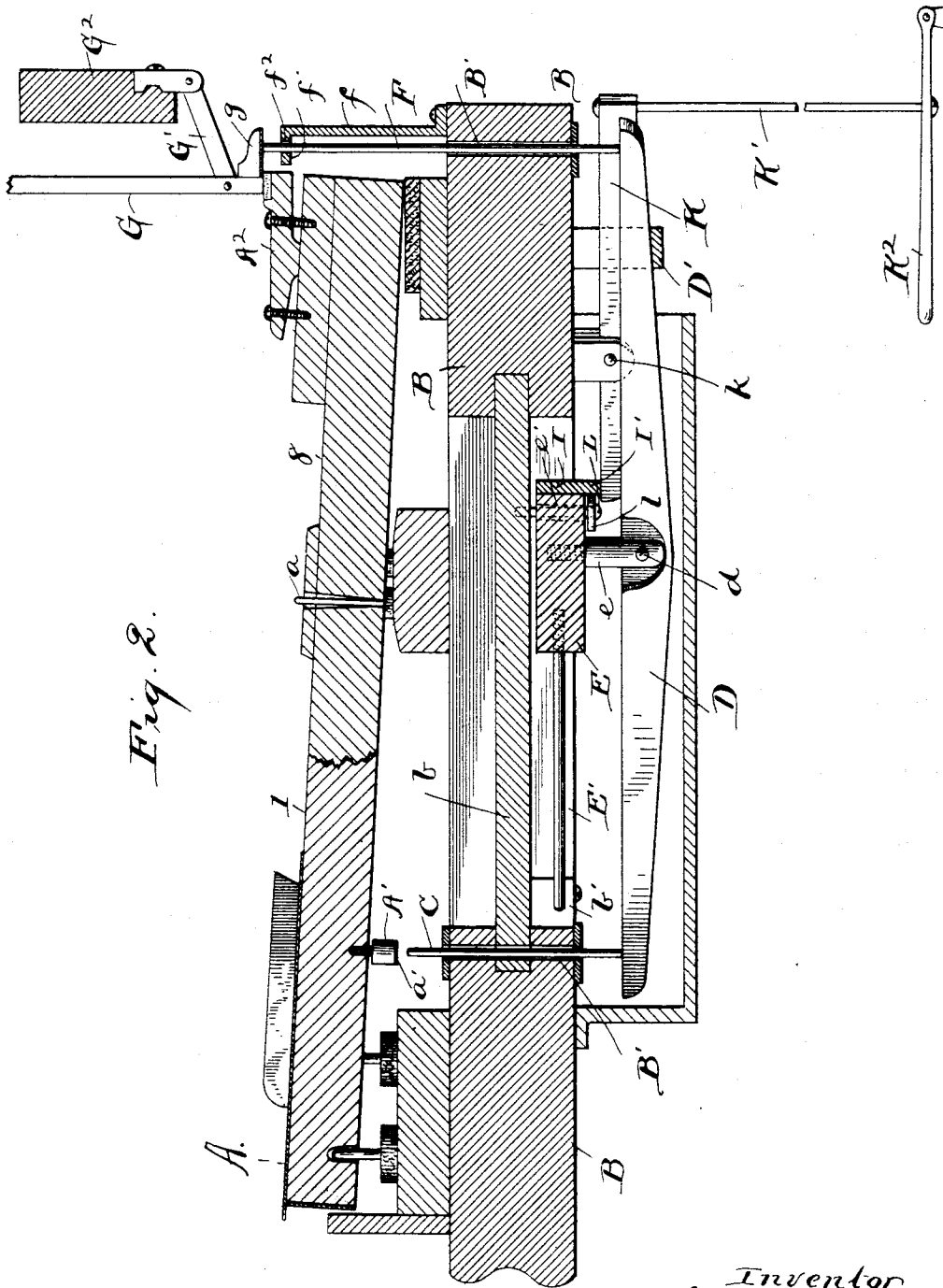
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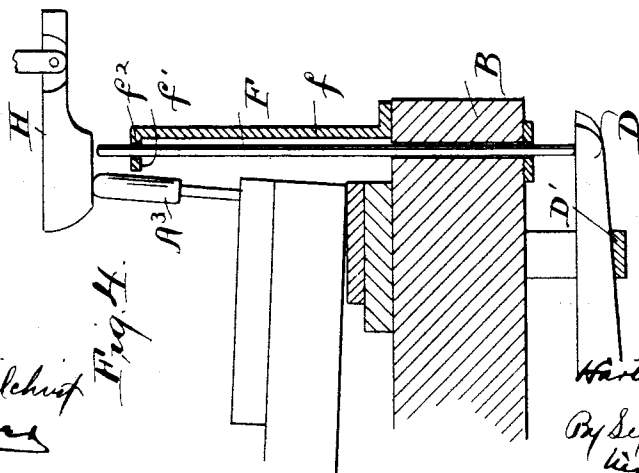
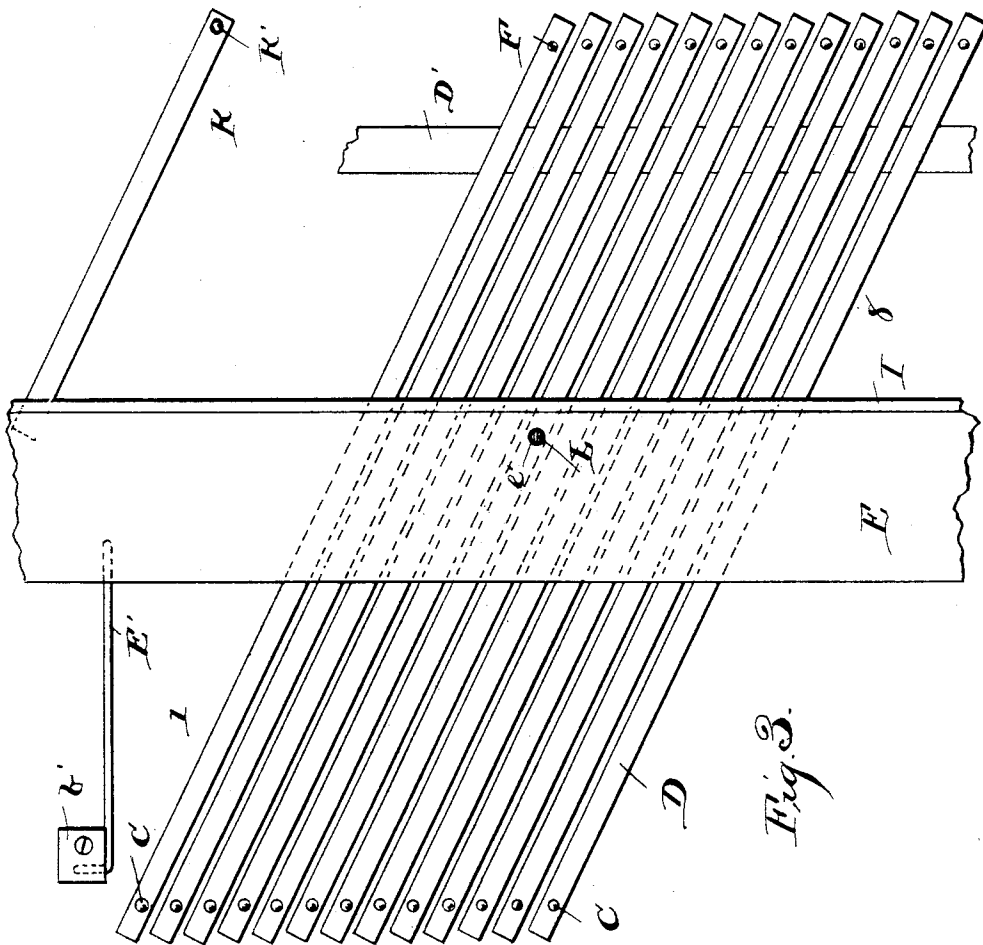
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Fig. 4.

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UNITED STATES PATENT OFFICE.

HARTWELL R. MOORE, OF NORWALK, OHIO.

PIANOFORTE.

SPECIFICATION forming part of Letters Patent No. 539,630, dated May 21, 1895.

Application filed January 24, 1893. Serial No. 459,552. (No model.)

To all whom it may concern:

Be it known that I, HARTWELL R. MOORE, of Norwalk, in the county of Huron and State of Ohio, have invented certain new and useful Improvements in Pianofortes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to improvements in piano-fortes; and more especially in mechanism whereby, upon actuating a hammer by striking a key of the key-board, another hammer may, if desired, be automatically actuated, thereby materially increasing the performer's capacity of playing and rendering possible combinations of sound and harmony utterly impossible to attain by the most skillful players in the absence of my improved mechanism.

My invention also consists in certain features of construction and in combination of parts hereinafter described and pointed out in the claim.

In the accompanying drawings, Figure 1 is a plan view of a portion of the key-board and bottom of an upright pianoforte and my improved attachments, portions being in section or broken away to more clearly show the construction and one of the levers D being shown in dotted lines. Fig. 2 is a vertical section of the key-board and key-bottom on line 2 2, Fig. 1, showing most of my improved attachment and a portion of the action of the pianoforte in elevation, portions being broken away to more clearly show the construction. Fig. 3 is a top plan of my improved attachment. Fig. 4 shows a portion of a somewhat modified pianoforte-action in connection with my attachments.

Referring to the drawings, A represents the keys of the key-board and B the key-bottom, the keys being fulcrumed, as at *a*, in the usual manner. The keys, that it is desired to adapt for actuating two hammers, are each provided, preferably about centrally forward of their fulcrum, with a downwardly-projecting stud, *A'*, that is adapted to engage the upper end of an upright pin or rod, C, that extends downwardly through the key-bottom and rests upon the forward end of a lever, D, that is fulcrumed, at its central portion, as at *d*, to a downwardly-projecting stud or flange,

e, of a vertically-movable rail or bar E that extends lengthwise of the piano underneath the central portion or panel, *b*, of the key-bottom, and is hinged or pivotally connected, at its central portion, by means of a rod, *E'*, to a stud, flange or ear, *b'*, of the key-bottom.

Levers D extend diagonally or obliquely of the key-bottom, as required, and said levers, 60 at the rear end, engage the lower end of and support an upright pin or rod F, that extends upwardly through the key-bottom and at its upper end (in the style of action shown in Fig. 2) engages the lower side of a rearwardly-projecting stud, flange or member, *g*, of abstract, G, of the mechanism for actuating a hammer of the action of the instrument, said abstract being pivotally connected, by means of a link, *G'*, to the action-rail, *G*². The hammer (not shown) that is adapted to strike the string of the instrument, is operatively connected, in the usual manner, with abstract G. The key, of course, does not directly engage the abstract, but the key-rocker, *A*², is suitably secured to the rear portion of the key and adapted to communicate with the abstract. 75

In another not uncommon style of pianoforte action a portion whereof is shown in Fig. 4, each key is provided with a dowel-prop, *A*³, adapted to engage the jack-rocker, H, of the mechanism for actuating a hammer of the action. Hence, with such construction the upright pin or rod F engages the lower side 85 of the jack-rocker.

Both constructions of piano-forte actions, a portion whereof is exhibited, and the mechanism for operatively connecting the hammer with jack-rocker H (in the case illustrated in Fig. 4) or with the abstract G (in the case shown in Fig. 2) are well understood by those skilled in the art and it is therefore not considered necessary to further illustrate or describe the same. 95

The position or elevation at which levers D are normally located is such that pins or rods C engaged by the forward ends of said lever, shall be separated sufficiently far from the respective keys by which they are adapted to be depressed, that said pins or rods shall not be actuated upon the operative actuation of the keys, and levers D are poised or balanced in such a manner that they shall hold 100

pins or rods C always in the position required relative to the keys.

Suppose now that the arrangement of parts is such that upon actuating key marked 1 in 5 Figs. 1 and 2 and the hammer adapted to be actuated by said key, the hammer that is adapted to be actuated by key marked 8, an octave higher, shall be adapted to be automatically actuated, and that rail or bar E and 10 attached levers D, and upright pins or rods C and F, have, by the means hereinafter described, been elevated or brought into the required position for the purpose. Lever D that supports pin or rod C that is adapted to 15 be depressed by key marked 1 extends diagonally of and underneath the key-bottom and supports the pin or rod F that actuates the hammer-actuating mechanism adapted to be actuated by key marked 8. Hence, in the case 20 just illustrated, upon striking key marked 1, not only the hammer-mechanism adapted to be actuated by said key is operated to perform its function, but also, and simultaneously therewith, is operated the hammer-actuating mechanism adapted to be operated by 25 key marked 8 that in the instance illustrated is adapted to sound a tone an octave higher. Hence, it will be observed that the performer's capacity of playing, by means of my improved attachments, is materially increased. 30

It is manifest (without illustration) that the arrangement of parts might be such that a hammer an octave lower than and in addition to the hammer adapted to be ordinarily actuated by a key, might be simultaneously actuated, it merely being necessary to change the 35 direction in which levers D extend. It is also manifest (without illustration) that the arrangement of parts might be such that two tones more or less than an octave apart might be sounded. 40

Any mechanic skilled in the art will readily be enabled to modify the construction to suit such requirements, without requiring illustration. 45

The key-bottom is, of course, suitably perforated, as at B', to accommodate the location and operation of pins or rods C and F, and studs A' are of course padded at their striking end, as at a'. 50

Bar E, levers D and pins or rods C and F are normally in an inoperative position, and the means employed for lifting bar E to elevate the fulcrum of levers D and thereby 55 bring pins or rods C supported by said levers in the operative position required to be actuated by studs A' of the keys, is actuated by a pedal in suitable proximity to the other pedals (not shown) of the instrument and is preferably as follows: To the lower side of 60 the key-bottom, preferably at or near the central portion of the piano-forte is fulcrumed a

lever K, as at k. The forward end of said lever is adapted to lift bar E and thereby elevate the fulcrums of levers D as hereinbefore 65 indicated, and lever K, at its rear end, is operatively connected by means of a link or rod, K', with a pedal K² below the piano-forte and located in the desired proximity to the other pedals of the instrument, the connection of said connecting rod with the pedal 70 being such that upon the depression of the pedal by the foot of the performer lever K shall be actuated to elevate bar E and consequently the fulcrums of levers D. 75

Bar E is preferably made of wood, but, to prevent said bar from warping, the rear edge of the same is faced with a metallic bar or strip, I, that extends somewhat below the under side of bar H, as at I', and is engaged directly by lever K. 80

Upon the release of the actuating pedal the parts, by gravity, automatically return to their normal position. A suitable stop, however, to limit the downward or return movement of bar E is preferably provided, such 85 for instance, as a stud, pin or bolt, L, secured to the key-bottom of the instrument and extending easily through a suitable perforation e' in bar E and provided with a head, nut or collar, l, below said bar so located as to form a suitable stop to limit the downward or return movement of said bar. 90

A guide is preferably provided for the upper ends of rods or pins F, said guide consisting preferably of an inverted I-shaped bar f secured to the key-bottom of the instrument, with the upper flange or horizontal member f' thereof perforated, as at f², for the reception and operation of said upright 95 pins or rods. A guard is also preferably provided for the rear portion of levers D, to hold said portions of the levers, normally, at the same elevation, said guard consisting preferably of a rail or bar, preferably a metallic bar, D', supported in any suitable manner 100 from the key-bottom of the instrument. 105

What I claim is—

The combination with a suitable hammer mechanism, keys, and pins F and C, of a bar 110 E located below the key bottom, rods E' connected with said bar and hinged to a suitable support, levers D pivotally supported from said bar E and arranged also below the key bottom, and suitable lever and pedal mechanism for operating the said bar to raise it, 115 substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 23d day of December, 1892.

HARTWELL R. MOORE.

Witnesses:

L. A. WEST,
L. L. DOWD.