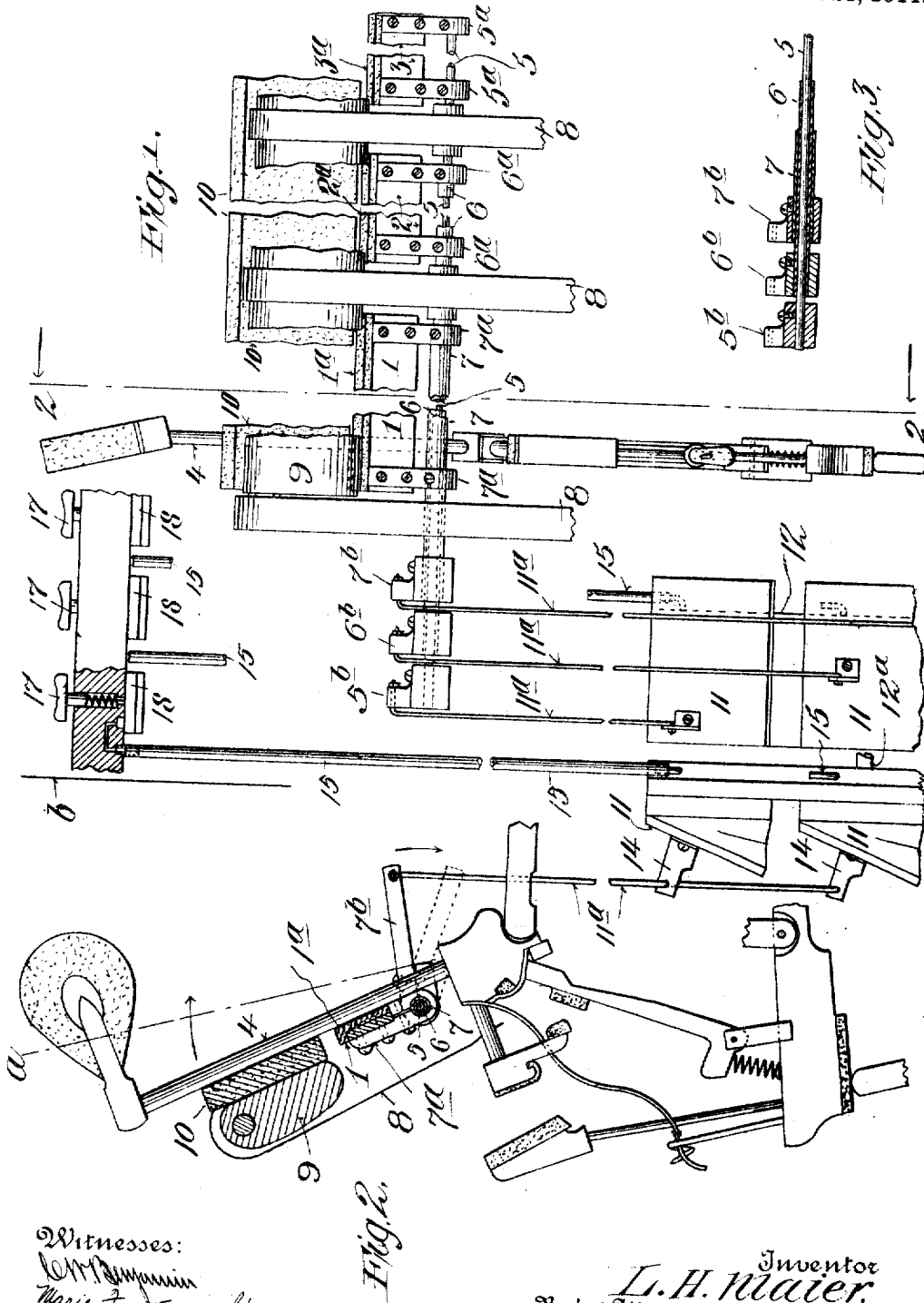


L. H. MAIER.
 EXPRESSION DEVICE FOR MUSICAL INSTRUMENTS.
 APPLICATION FILED OCT. 19, 1910.

1,009,330.

Patented Nov. 21, 1911.



Witnesses:
 L. H. Maier
 Marie F. Wright

Inventor
 L. H. Maier.
 By *Attorney* A. F. Bourne

UNITED STATES PATENT OFFICE.

LOUIS H. MAIER, OF NEW YORK, N. Y.

EXPRESSION DEVICE FOR MUSICAL INSTRUMENTS.

1,009,330.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LOUIS H. MAIER, a citizen of the United States, and resident of New York city, borough of Bronx, in the county of New York and State of New York, have invented certain new and useful Improvements in Expression Devices for Musical Instruments, of which the following is a specification.

The object of my invention is to provide improved means to permit the damping or softening of the tones at will of various series of strings of a piano, whereby the strings of one, two or more of such series may be damped as desired, to produce subdued or pianissimo effects.

In carrying out my invention I provide a plurality of hammer rails, each rail being associated with a desired number of hammers of the piano action, and each of such rails is connected with operating means for independently operating each such rail, the means I have shown comprising concentrically disposed oscillatory members, each member being connected with one of the hammer rails to support and operate the same, with means for independently operating, as desired each of such members.

My invention also comprises novel details of improvement and combination of parts that will be more fully hereinafter set forth and then pointed out in the claims.

Reference is to be had to the accompanying drawings forming part hereof, wherein, Figure 1 is a face view, partly broken, of a portion of a piano action illustrating my improvements in connection therewith, the operating bellows being illustrated on a reduced scale; Fig. 2 is a vertical section substantially on the line 2, 2, in Fig. 1, and Fig. 3 is a central section through a portion of the operating members for the hammer rails.

Similar numerals of reference indicate corresponding parts in the several views.

The numerals 1, 2, 3, indicate hammer rails shown provided with felt or the like 1^a, 2^a, 3^a, each of said rails being of suitable length to coact with any desired number of hammers 4 of the piano action, which latter may be of any well-known or suitable construction. Said rails are shown in line with each other, end to end.

At 5 is a shaft or member journaled to rock in suitable bearings and shown pro-

vided with arms or supports 5^a connected with the hammer rail 3.

At 6 is a tubular shaft or member mounted concentrically upon shaft 5 and provided with arms or supports 6^a connected with hammer rail 2.

At 7 is a tubular shaft or member mounted concentrically upon shaft 6 and provided with arms or supports 7^a connected with hammer rail 1.

The concentric shafts 5, 6, 7, are shown journaled in bearings in the piano action brackets 8, which are shown supporting the general hammer rail 9 that extends the length of the action and operated by a pedal as usual, said rail having usual felt 10, although said shafts may be supported in any suitable manner.

In Fig. 1 the hammer rails 1, 2, 3 and their shafts are shown broken away to indicate that they each may be of any desired length to correspond to any desired number of strings, and the length of shaft 5 will be equal to the entire series of strings, while shafts 6, 7, will have a suitable length proportioned to the number of hammers with which the corresponding hammer rails coact, any suitable number of such rails and their shafts being provided. The shafts 5, 6, 7 are provided, respectively, with arms or projections 5^b, 6^b, 7^b, for rocking said shafts separately. Suitable means are provided for operating said arms. The means I have shown for such purpose comprise independent bellows 11, upon a chest 12, and connected with the corresponding arm 5^b, 6^b, 7^b, by suitable links or rods 11^a, shown attached to brackets 14 carried by said pneumatics or bellows.

Any suitable means may be provided for causing the operation of either of such pneumatics or bellows which have well valves. I have shown pipes 15 which communicate with each such valve as usual. Suction through said chest is maintained in any suitable or well known manner through pipe 12^a. From the foregoing it will be understood that when either of the pneumatics is caused to collapse it will operate the corresponding rod 11^a and arm 5^b, 6^b or 7^b, to cause operation of the corresponding shaft 5, 6 or 7, whereby the corresponding hammer rail 1, 2 or 3 will be moved forwardly to carry the corresponding series of hammers forwardly to reduce the

blow of the hammer on string *b*, as to a point corresponding to the broken line *a* in Fig. 2. One or more of such hammer rails may be operated at a time. This may be done by spring pressed buttons 17 operating valves 18 that control the opening and closing of the orifices of pipes 15. By this means damping of any desired set of strings whether in the treble, bass or tenor, or any number of these, may be effected as desired, whereby pianissimo or subdued tonal effects may be produced at will. By having the shafts 5, 6, 7 supported concentrically as set forth and correspondingly carrying the hammer rails, the positions of the latter may be maintained uniformly with respect to each other, the construction is simplified, and a compact arrangement is provided.

Having now described my invention what I claim is:—

1. The combination with the hammers of a piano action, of a plurality of hammer rails, each associated with a plurality of said hammers, a shaft supporting one of said rails, and a hollow shaft disposed upon the first named shaft and connected with another of said rails, said shafts being rotatably mounted.

2. The combination with the hammers of a piano action, of a plurality of hammer rails adjacent said hammers, a shaft, supports connecting said shaft with one of said rails, a hollow shaft concentrically disposed upon the first named shaft, supports connecting the hollow shaft with another of said rails, a second hollow shaft concentrically disposed upon the first named hollow shaft, supports connecting the second named hollow shaft with another of said hammer rails, and means for operating said shafts at will.

3. The combination with the hammers of a piano action, of a plurality of hammer

rails, concentrically disposed members each of which is connected with one of said hammer rails, pneumatics, concentrically disposed arms on said members, and means connecting each of said pneumatics with said arm of one of said members for rotating the latter to actuate the hammer rails.

4. The combination with the hammers of a piano action, of a plurality of hammer rails, concentrically disposed members, each of which is connected with one of said hammer rails, pneumatics, arms extending from said members, and connections between said arms and said pneumatics for operating the former by the latter to actuate the hammer rails.

5. The combination with the hammers of a piano action, of a plurality of hammer rails, concentrically disposed members each connected with one of said hammer rails, a chest, a plurality of pneumatics connected with said chest, concentrically disposed arms on said members, and means connecting each of said pneumatics with said arm of one of said members for rotating the latter to actuate the hammer rails.

6. The combination with the hammers of a piano action, of a plurality of hammer rails, concentrically disposed members each connected with one of said hammer rails, a chest, a plurality of pneumatics connected with said chest, and means connecting each of said pneumatics with adjacent end of a corresponding member for rotating the latter to actuate the hammer rails.

Signed at New York city, in the county of New York, and State of New York, this 15th day of October, A. D. 1910.

LOUIS H. MAIER.

Witnesses:

T. F. BOURNE,
RALPH H. RAPHAEL.