H. T. LOGAN.

MECHANICAL PIANO PLAYER.

APPLICATION FILED APR. 13, 1906.

900,179.

Patented Oct. 6, 1908.

2 SHEETS—SHEET 1.

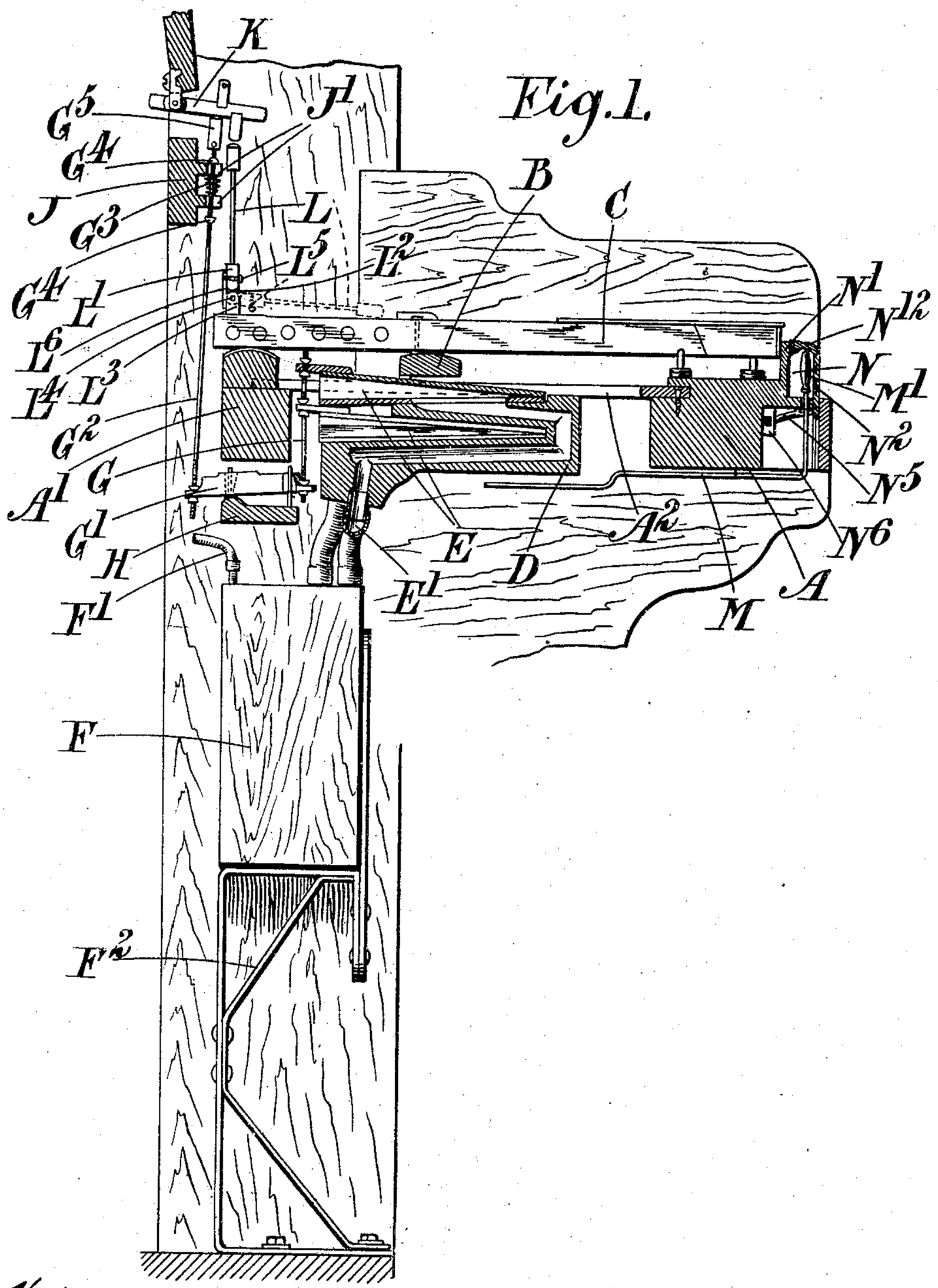

Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 2.

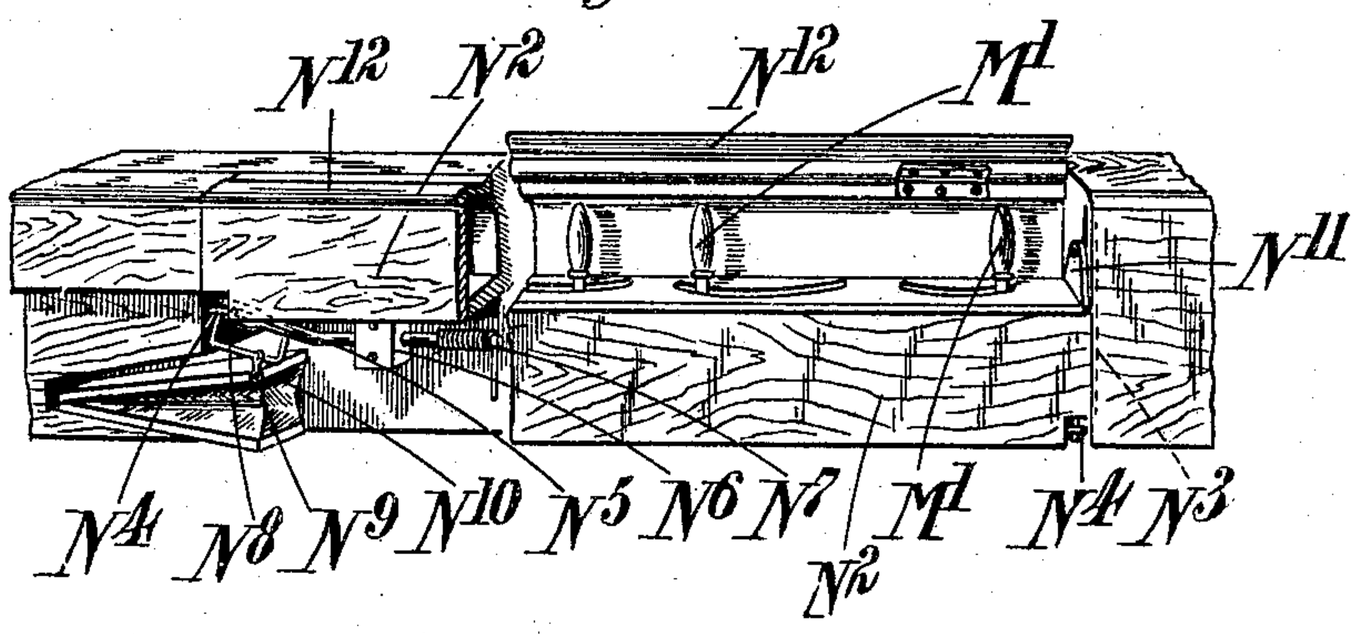
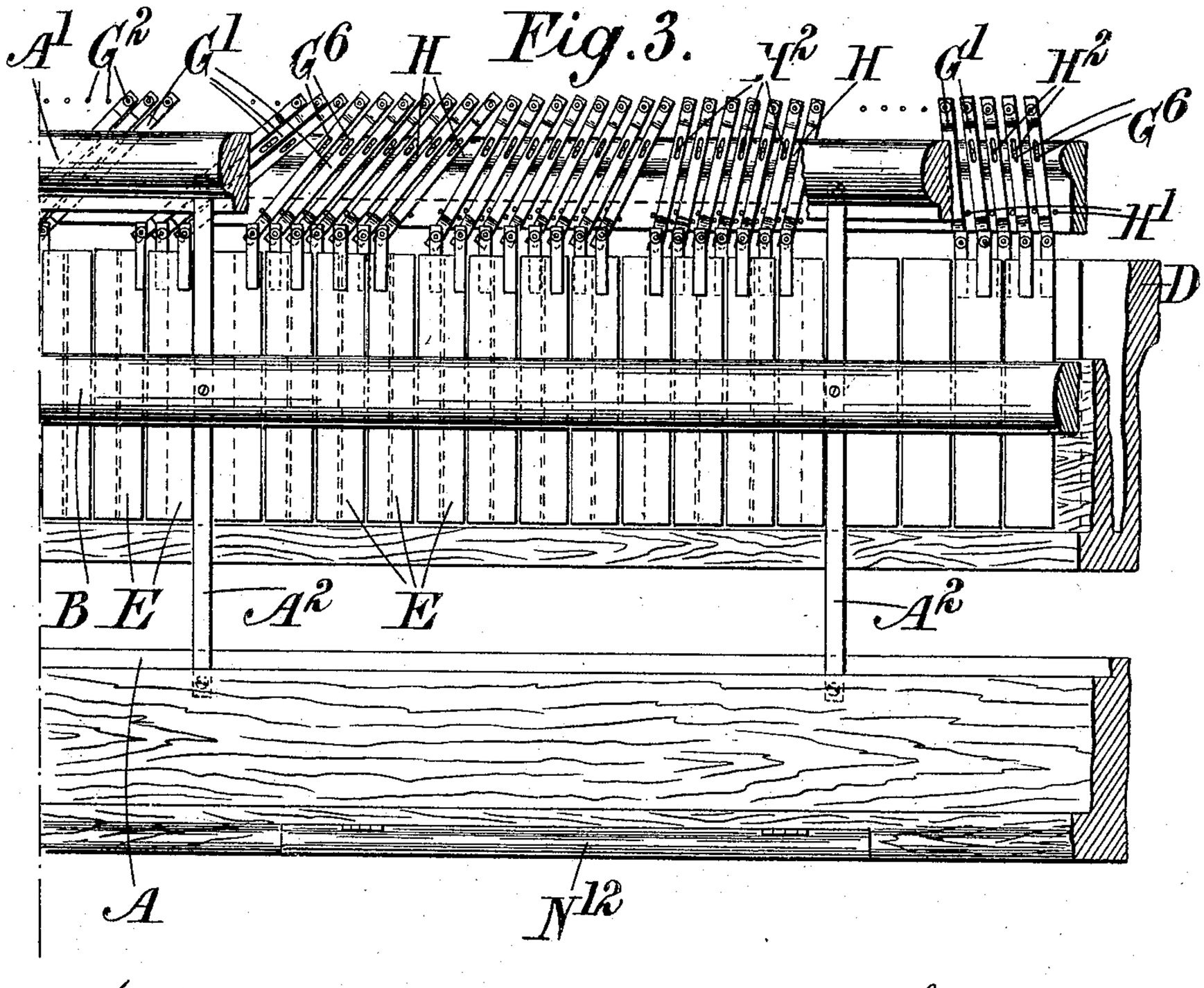


Fig. 3.



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UNITED STATES PATENT OFFICE.

HUMPHREY THOMAS LOGAN, OF ERITH, ENGLAND.

MECHANICAL PIANO-PLAYER.

No. 900,179. Specification of Letters Patent. Patented Oct. 6, 1908.

Application filed April 13, 1906. Serial No. 311,515.

To all whom it may concern:

Be it known that I, HUMPHREY THOMAS LOGAN, a subject of the King of England, and residing at Erith, in England, have invented certain new and useful Improvements in Mechanical Piano-Players, of which the following is a description.

This invention relates to improvements in mechanical piano-players and has particular reference to those devices which are arranged within the case of a piano or like instrument.

One object of this invention is to provide a compact and effective arrangement of the automatic devices and air conduits within the piano case.

Another object is to enable a piano-playing attachment of standard size to be fitted to pianos having different actions.

According to this invention the pneumatics are arranged within the key-bottom of the piano and are connected by suitable conduits with the wind or valve chest which is disposed in the lower portion of the piano. For this purpose the wooden cross bars which are generally used in the key-bottom of a piano are removed and are replaced by narrow bars of steel or other strong metal which support the usual balance rail of the piano keys. A frame carrying the pneumatics preferably in two sets one above the other is secured in the key-frame or bottom with the acting ends of the pneumatics towards the rear of the piano. The pneumatics which only operate a certain number of the sound-producers of the piano are so disposed as to occupy the whole of the key-bottom and the set of pneumatics may thus be manufactured in a standard size which will fit any piano.

The motion of the pneumatics is communicated to the action of the different sound-producers through levers pivoted upon a beam extending across the piano from end to end and a feature of this invention consists in arranging the pivoted levers at various angles to the walls of the piano so that a set of pneumatics of standard length may be fitted to pianos having different actions by a suitable variation in the length of the pivoted levers and their angle of inclination.

The inner ends of the pivoted levers act upon upright rods having at the upper ends pilots arranged to impinge on the wippens or jacks of the piano action. These rods are guided in a bracket projecting from a fixed bar in the piano case and the guide slots are so shaped that the rods can be removed laterally therefrom. Springs attached to the rods are arranged to engage abutments such as the guide bracket so as to hold the rods normally in their lower position. Projections on the rods, conveniently leather washers, are so disposed as to engage fixed stops and limit the upward movement of the rods so as to prevent locking of the action.

To accommodate the controlling levers of the piano-player, a recess is cut in the key-slip, that is the bar which extends across the piano in front of the keys. A sliding door to cover the recess is supported on a spring-controlled frame pivoted in the key-bottom and engaging both ends of the door so that the vertical motion of the door is the same at both ends. The sliding door can be pressed down into a space in the key-bottom, while the spring-controlled frame tends to close the door again. The sliding door may be held open by a catch while the automatic piano-player is in action.

In the accompanying drawings:—Figure 1 is a vertical section through the front portion of one construction of mechanical piano-player, according to this invention; Fig. 2 is a perspective view of a portion of the key-slip; Fig. 3 is a plan of a part of the key-bottom with the keys removed.

With reference first to Figs. 1 and 3, A is a bar extending across the piano and forming part of what is generally known as the key-bottom, and extending from this bar to another bar A^1 are steel rods or bars A^2 supporting the usual balance rail B for the piano keys C. Beneath these bars A^2 and supported by them is a frame D carrying striking pneumatics E arranged in two sets one above the other. Each of these pneumatics is connected by a tube E^1 to a valve-box F in the front of the piano and beneath the key-bottom. For the purpose of this invention it is not necessary to describe the arrangements within the valve box F. They may be of any known type and preferably comprise primary valves operated through passages F^1 controlled from the tracker-board, and secondary valves operated by the primaries and governing the passages to the striking pneumatics E. The valve-box F is supported by brackets F^2.

Each of the striking pneumatics E is connected by a rod G to one end of a lever G^1 pivoted upon a bar H and bearing at its other extremity a striking rod G^2. The upper end of this rod G^2 passes between slotted guides formed in a bar J and is provided with a spring G^3 and adjustable buttons G^4 which limit its motion. The top of the rod G^2 is furnished with a head G^5 which, when the rod G^2 is moved upward through the collapse of its striking pneumatic E carries the wippen or jack K of the piano action with it and operates the sound-producing device. No details of the hammers or other parts of the action are shown, as they may be of any well known type. The return movement of the rod G^2 is assisted by the action of the spring G^3, the lower end of which grips a threaded portion of the rod.

As shown in Fig. 1 the guide slots J^1 for the rod G^2 are open towards the front so that the rod may be removed when necessary.

It will be seen from Fig. 3 that the levers G^1 are guided by pins H^1 in the bar H and are slotted as at G^6 to accommodate the pivot pin H^2. Further, in order that pneumatics E of standard size may be used in pianos having actions slightly varying in width or spacing, the length of the levers G^1 and the angle of their inclination may be varied. Fig. 3 shows the levers G^1 arranged in groups, the inclination of the members forming one group being somewhat different from those of the next group. It should be mentioned in this connection that this arrangement is possible because the striking pneumatics in an automatic piano-player are as a rule only required to operate over a certain range of the instrument. Each of the piano keys C is provided at its rear end with a pilot L acting upon the wippen K, but in order that the pilots L which are in front of the striking rods G^2 of the automatic action shall not interfere with the ready access to those rods the pilots L are pivoted or otherwise arranged to turn down out of the way. In the construction shown in Fig. 1 this is brought about by providing the block L^1 forming the base of the pilot with a tongue L^2 fitting into a slot in another block L^3 fixed to the back of the key, a pin L^4 being passed through the slot and tongue to act as a pivot. A small screw L^5 is provided which serves to keep the pilot in its vertical position when in use by securing it to a back strip L^6. By loosening this screw the pilot can be turned down on to its key as shown in dotted lines in the drawing.

The regulating and controlling levers M are brought to the front of the piano and their handles M^1 are inclosed in a recess or box N in the key-slip N^1. This recess is provided with a sliding door N^2, the ends of which are guided as at N^3, Fig. 2, in slots cut to receive them in the key-slip. Pins N^4 at the ends of the door N^2 engage with slotted arms of a rod or frame N^5. This is mounted so that it can turn in blocks N^6 and is provided with a spring N^7 which tends to keep the arms raised, as shown in the left-hand portion of Fig. 2, thus keeping the door N^2 also raised and the front of the recess closed. Attached to one of the arms N^5 is a light frame N^8 engaging with an eye N^9 upon a small bellows N^{10}. This bellows is closed when the door N^2 is pushed down against the action of the spring N^7 and acts when the spring is allowed to raise the door to make the motion slow and easy, by reason of the fact that but a very small inlet for air is provided in the bellows. The door N^2 can be retained in its lower position against the action of the spring N^7 to keep the lever handles exposed during the playing of the instrument by means of a pivoted catch N^{11}. This may conveniently be arranged so that it falls by gravity into its engaging position as soon as the door N^2 is depressed and must then be pushed away to release the door. A narrow hinged lid N^{12} serves to close the top of the recess. This recess with its sliding door and other mechanism forms the subject of a concurrent application and is not claimed in the present case.

The operative connections between the pneumatics E in the key-bottom and the action may be modified to suit the particular construction of the piano.

What I claim as my invention and desire to secure by Letters Patent is:—

1. In a mechanical piano-player the combination of striking mechanism, a key bottom having a recess, a striking pneumatic disposed in said recess, and operative connections between the striking mechanism and the pneumatic.

2. In a mechanical piano player the combination of striking mechanism, a key bottom, a series of striking pneumatics disposed in the key bottom, pivoted levers of different lengths angularly adjustable on vertical axes, connections between said levers and pneumatics, and striking rods operatively connected to the levers so that by varying the angle of inclination of the pivoted levers and using levers of different lengths a standard set of pneumatics can be used with piano actions of various widths.

3. In a mechanical piano player the combination of striking mechanism, a striking pneumatic, a striking rod operatively connected to the pneumatic, a slotted guide for said striking rod, adjustable buttons on the rod and a spring secured to the rod and working against the guide.

4. In a mechanical piano player the combination of a striking mechanism including a wippen, a key bottom, a key lever, a pilot pivoted to said key lever and operating in one position upon the wippen, a pneumatic

disposed in the key bottom, a striking rod at the rear of the key lever and operating upon the wippen, a pivoted lever connected to the lower end of said striking rod, and an operative connection between the pneumatic and said pivoted lever.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HUMPHREY THOMAS LOGAN.

Witnesses:
HARRY B. BRIDGE,
ARCHIBALD J. FRENCH.