

No. 884,320.

J. W. DAVIS.

PATENTED APR. 7, 1908.

MANUALLY AND PNEUMATICALLY OPERATED AUTOMATIC PIANO.

APPLICATION FILED SEPT. 25, 1906.

2 SHEETS—SHEET 1

Fig. 1.

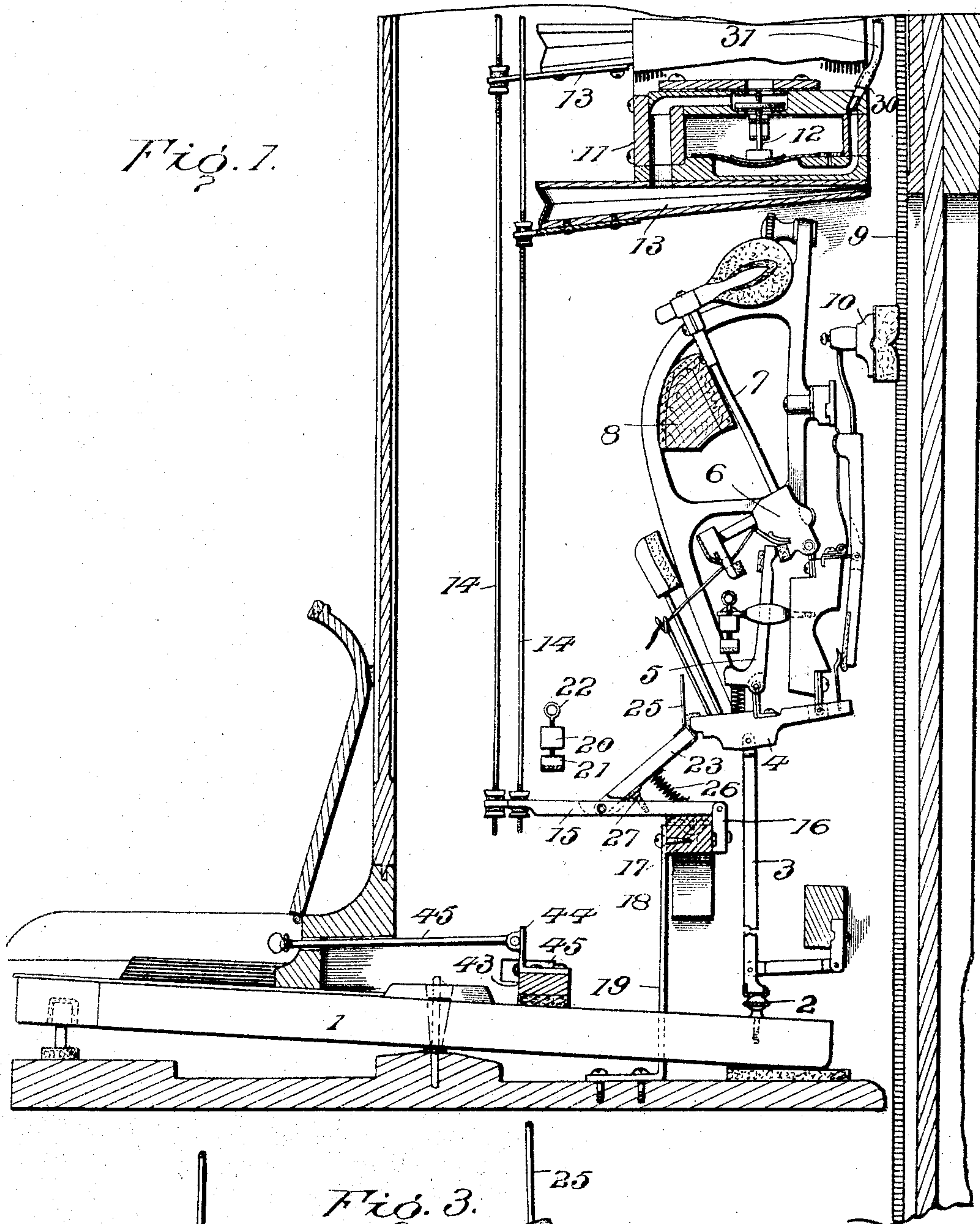
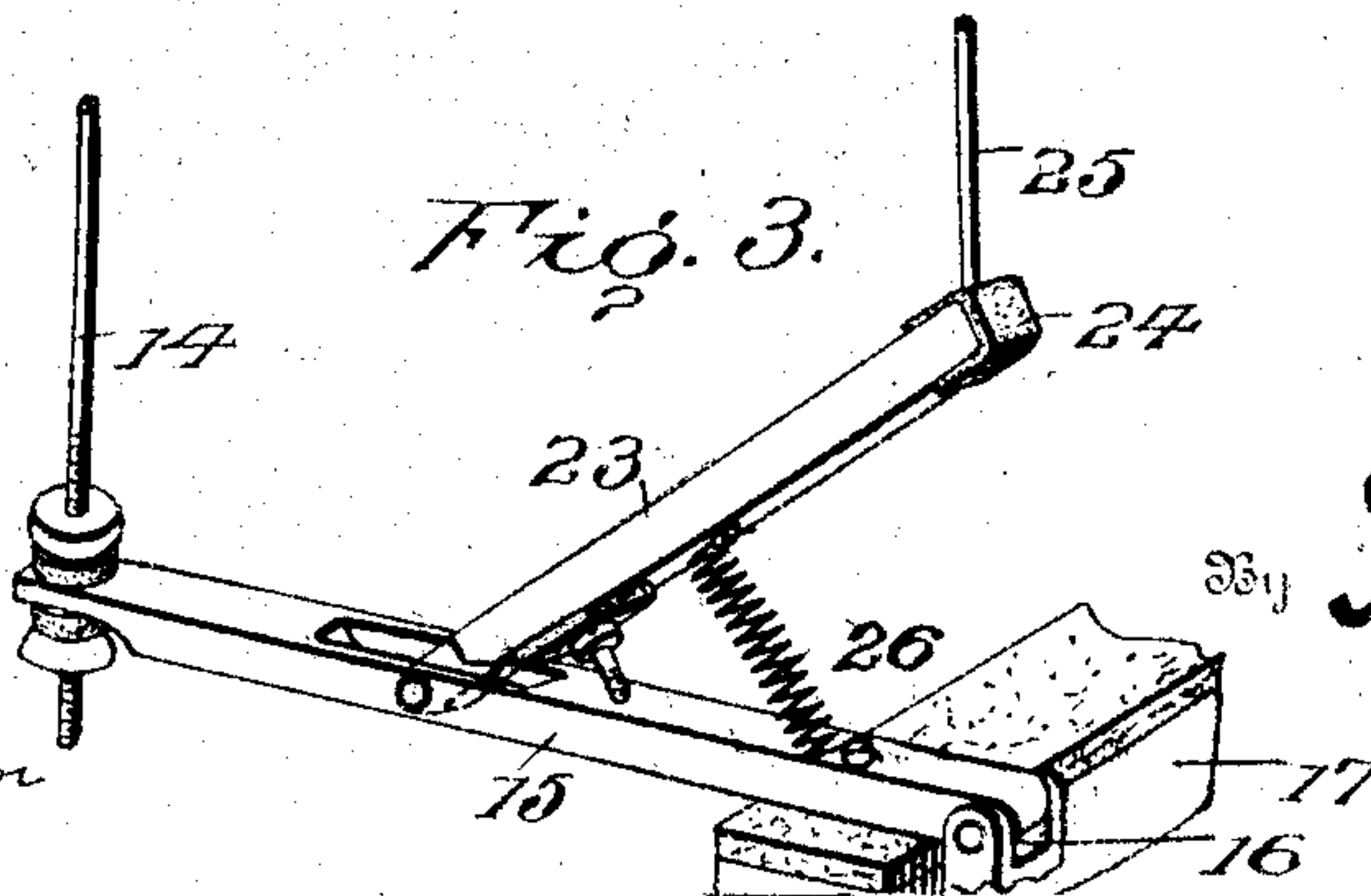


Fig. 3.



Witnesses

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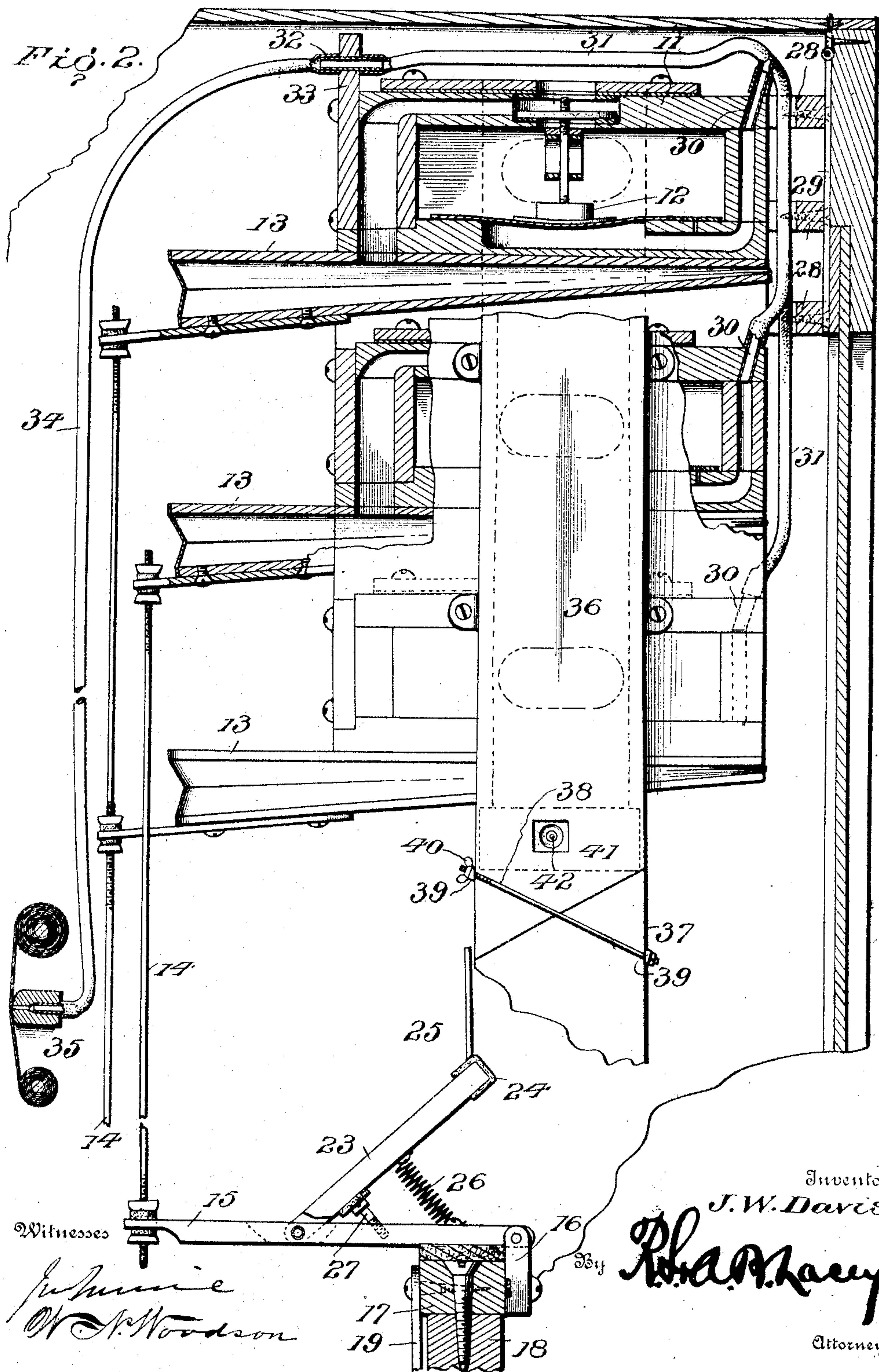
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2 SHEETS—SHEET 2.





# UNITED STATES PATENT OFFICE.

JOHN W. DAVIS, OF PULASKI, TENNESSEE, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE DAVIS PIANO PLAYER COMPANY, OF PULASKI, TENNESSEE, A CORPORATION OF TENNESSEE.

## MANUALLY AND PNEUMATICALLY OPERATED AUTOMATIC PIANO.

No. 884,320.

Specification of Letters Patent.

Patented April 7, 1908.

Application filed September 25, 1906. Serial No. 336,210.

*To all whom it may concern:*

Be it known that I, JOHN W. DAVIS, citizen of the United States, residing at Pulaski, in the county of Giles and State of Tennessee, have invented certain new and useful Improvements in Manually and Pneumatically Operated Automatic Pianos, of which the following is a specification.

This invention contemplates improvements in that class of automatic piano players which may be operated both automatically and manually without interference between the two operations, and the object of the invention is to provide an automatic piano action which may be incorporated in or embodied with a piano of any ordinary structure without necessitating any changes in the ordinary action and without interference in any wise with the manual operation of the piano at all times.

A further object of the invention is to provide means whereby the automatic action may be swung out of the way of the ordinary action without the necessity of wholly detaching the automatic action from the piano case, the arrangement being such that the wind chest carrying the pneumatics or the other automatic action may be swung outwardly and upwardly out of the way, so that access may be had to the strings for the purpose of tuning the piano, or to the ordinary action for the purpose of repair or the like.

With this and other objects in view as will more readily appear as the description proceeds, the invention consists in certain constructions, arrangements and combinations of the parts hereinafter described and particularly pointed out in the appended claims.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a vertical sectional view, with parts in side elevation, of a portion of a piano embodying the improvements of my invention. Fig. 2 is a view on an enlarged scale, partly in section and partly in side elevation, of the wind chest of my improvement illustrating the manner in which it is hinged to the piano case. Fig. 3 is a detail perspective view of the auxiliary automatic wippen

which constitutes one of the features of the invention.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

Referring to the drawings, the numeral 1 designates a key lever mounted in the usual manner in the key bed; 2 the capstan screw of the key lever; 3 the extension bearing upon said screw and pivotally connected at its upper end to the wippen 4; 5 the trigger or jack pivotally mounted upon the wippen 4 and designed for engagement with the butt 6 of the hammer 7; 8 the hammer rest rail; 9 the strings, and 10 the damper. All of these parts may be of any desired construction and arrangement as they form no essential parts of my invention by themselves.

The wind chest 11 of my improvement may be provided with any of the ordinary forms of diaphragm pneumatics and valves 12 for governing the action of the bellows pneumatics 13 and the latter may be secured in the ordinary way by means of mechanical trackers 14 to the front end of the auxiliary wippens 15 for the respective main wippens 4. These auxiliary wippens and their concomitant parts constitute one of the essential features of the invention. The auxiliary wippens 15 are pivotally mounted at their rear ends on the bracket arms 16 secured to the felt covered beam or rail 17 which extends from end to end of the piano action and is detachably secured in any desired manner, as upon the supporting ledge 18. This rail 17 is preferably braced at intervals along its length by means of the brackets 19 secured thereto and to the key bed as shown best in Fig. 1.

20 designates an abutment rail carrying a series of felt covered abutments 21 carried upon adjustable screws 22 working through the rail and adapted to limit the upward movement of the auxiliary wippens 15.

Each of the wippens 15 carries an auxiliary jack or trigger 23 which is pivotally mounted thereupon as illustrated best in Fig. 3 and which extends rearwardly and upwardly, with its upper end (covered by felt 24) normally in engagement with the front end of the main wippen 4, as illustrated in Fig. 1. As shown in this view of the drawings, the



end of the auxiliary jack 23 lies underneath the end of the wippen 4 in position to raise the wippen and actuate the hammer 7 when the auxiliary wippen 15 is raised by its pneumatic 13, and a guide pin 25 projects upwardly from the free end of the jack 23 and bears upon the front end of the wippen 4 so as to properly guide the jack 23 at all times. The compression spring 26 connects the pivotal jack 23 with the auxiliary wippen 15 and draws the jack towards the wippen so as to always maintain it in proper position in effective action upon the main wippen 4. A screw 27 works through the auxiliary wippen 15 at an oblique angle as shown, and is designed to limit the relative movement of the auxiliary jack 23 towards the wippen 15.

From the foregoing description in connection with the accompanying drawings, it will be seen that the actuation of the pneumatic 13 will cause the auxiliary wippen 15 to rise and press its jack 23 upwardly against the main wippen 4 so as to actuate the hammer 7 against the strings. It is manifest that the automatic action described interferes in no wise with the manual actuation of any of the keys 1 and that no part of the main or ordinary action of the piano requires change in construction or arrangement to embody my improved automatic action in the piano case. Either the automatic action or the manual action may be effected without the one interfering in any wise with the other, and it is to be particularly noted that if the pneumatic action of any one or more of the keys is brought into play while such keys are in a depressed position from the manual actuation, no injurious or unlooked for effect will be produced, because the guide stems 25 will not permit the auxiliary jack 23 to pass underneath the wippens 4 and strike them at any point closer to the extension 3, which would manifestly occur if these guide stems 25 were not provided, owing to the arc which the auxiliary wippen describes.

Another feature of the invention consists of the manner of mounting the wind chest 11. Referring particularly to Fig. 2, it will be seen that the wind chest is provided at its rear with a series of superposed supporting rails 28 which are connected to one member of a hinge 29, the other member of said hinge being secured in any desired manner to the case of the instrument. The metallic tubes 30 leading to the respective compartments of the wind chest in communication with the pallets 12 are secured to their respective tracker tubes 31 and these tubes are brought upwardly and over the top of the wind chest and thence forwardly with their front ends inserted over a horizontally extending series of tubes 32 rigidly secured in the auxiliary or intermediate tracker board 33 and pro-

jecting forwardly and rearwardly from said board. The tubes 31 may be permanently attached at their front ends to the rearwardly projecting ends of the tubes 32, and to the forwardly projecting ends of these tubes 32, the flexible tubes 34 are secured, said latter tubes extending forwardly and downwardly to the main tracker board 35 over which the perforated web or roll passes in the ordinary manner.

36 designates the wind trunk which is in communication with the several compartments of the wind chest and through which the air is drawn from said compartments, the lower end of this wind trunk being operatively connected to the main bellows (not shown) by any suitable connection such as that shown at 37.

By mounting the wind chest 11 as above described, it is evident that the entire automatic action may be swung outwardly and upwardly out of the case so as to leave the ordinary piano action in plain view and in convenient access for purposes of repair or other attention, it being only necessary for this swinging movement of the wind chest and other parts of the automatic action, to unscrew the rail 17 and swing the entire automatic action outwardly and upwardly as a whole, or to uncouple the tracker rods 14 so that the rail 17 and the wippens carried thereby may be removed and the wind chest then swung up over the top of the piano case. It is therefore manifest that not only does my improvement or invention provide means whereby the automatic action may be applied to any upright piano without any change in the construction or arrangement of the main parts thereof, but it also provides means whereby the automatic action may be readily swung out of the way of the ordinary manual action when it is desired to obtain access to the latter, while when the automatic action is in place, the piano may be played either automatically or manually without one operation interfering in any wise with the other.

As one specific means for operatively connecting the wind trunk 36 to the main bellows in such a manner that the wind trunk itself may be swung upwardly and outwardly with the wind chest, reference is to be had to Fig. 2. As shown in this view of the drawings, the wind trunk is constructed in two sections of which the section 37 that is designed to connect with the bellows in any suitable manner, is a stationary section, and is joined with the section 36 above it on a diagonal line as shown, so that the upper section 36 may be swung upwardly and outwardly with the wind chest as is manifest. When the parts are in position, as shown in Fig. 2, that is, with the wind chest and the wind trunk in operative position, the two sections of the expression box are preferably



clamped together by means of tie bolts 38 extending through apertured lugs or straps 39 secured to the respective sections as shown and attached, detached, and tightened, by means of thumb nuts, or the like, 40.

In dotted lines in Fig. 2, and indicated by the reference numeral 41, is indicated a hinged flap for throttling the air passage constituted by the wind trunk to a greater or less degree to change the expression, and 42 designates the actuating rod connected to said flap and actuated in any desired manner, although preferably by the means that are disclosed in my companion application executed of even date herewith.

As has been stated, my improvements herein described enable the piano to be operated either automatically or manually, or both automatically and manually at the same time, so that a duet or trio may be played upon the piano, the players' hands performing one part and the automatic action the other part. If desired, the manual action may be prevented by means of locking mechanism for the key levers. In the present instance, the means to accomplish this end is illustrated in Fig. 1 and is shown as consisting of a rail 43 extending from end to end of the piano case above the key levers 1 at the rear of their fulcra, said rail being adapted to rest upon the rear ends of the key levers so as to prevent them from being raised at their rear ends and depressed from their key ends. This rail may be secured at its ends and intermediate of its length to bell crank levers 44, or similar devices fulcrumed on suitable supports 45. One arm of these levers 44 may be connected to the push or pull rods 45 that extend through the case to the front thereof at any convenient point within reach of the operator. It is evident that by manipulating these push rods or pull rods, as the case may be, the rail 43 may be raised out of contact at their rear ends to permit the keys to be depressed or swung into engagement with the rear ends of the key levers to prevent manual actuation of the keys whenever desired.

Having thus described the invention, what is claimed as new is:

1. The combination with a piano action embodying a wippen, and a jack carried thereby, of an auxiliary wippen pivotally mounted adjacent one end of the main wippen, an auxiliary jack pivotally mounted on said auxiliary wippen and extending rearwardly and upwardly with its end normally in engagement with the front end of the main wippen, a spring connected to the auxiliary

wippen and to said jack and tending to draw the auxiliary jack rearwardly and downwardly towards the auxiliary wippen, and a guide stem carried by the upper end of said auxiliary jack and extending upwardly and adapted to bear against the rear end of the main wippen, as and for the purpose set forth.

2. The combination with a piano action embodying a main wippen and a jack carried thereby, of an auxiliary wippen pivotally mounted adjacent one end of the main wippen, an auxiliary jack pivotally mounted on said auxiliary wippen and spring pressed towards the latter, one end of the auxiliary jack being designed to engage and lift the main wippen, and a guide stem carried by the said auxiliary jack and engaging an end of the main wippen, as and for the purpose set forth.

3. In combination with a piano action embodying a main wippen and a jack carried thereby, of an auxiliary wippen, a support on which said auxiliary wippen is pivoted at one end, means connected to the other end of the auxiliary wippen for automatically actuating the same, an auxiliary jack pivotally connected at one end to the auxiliary wippen and designed to engage the main wippen with its free end, a spring tending to draw said auxiliary jack towards the auxiliary wippen, a guide stem carried by the free end of the auxiliary jack and engaging the adjacent end of the main wippen, and a screw mounted in the auxiliary wippen and against which the auxiliary jack is adapted to abut to limit its independent movement in one direction on the auxiliary wippen.

4. In an instrument of the character described, the combination with its action, a wind chest, and means whereby the wind chest may automatically operate the action of a wind trunk secured to said wind chest, the wind trunk being constructed in sections of which one is relatively stationary and the other movable with the wind chest, said sections being adapted to abut against each other, means for clamping the abutting ends of said sections together, the said means being detachable, and means whereby the wind chest with the one section secured to it may be swung away from the other section.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN W. DAVIS.

Witnesses:

EUNICE C. FREEMAN,  
BEN CHILDERS.