

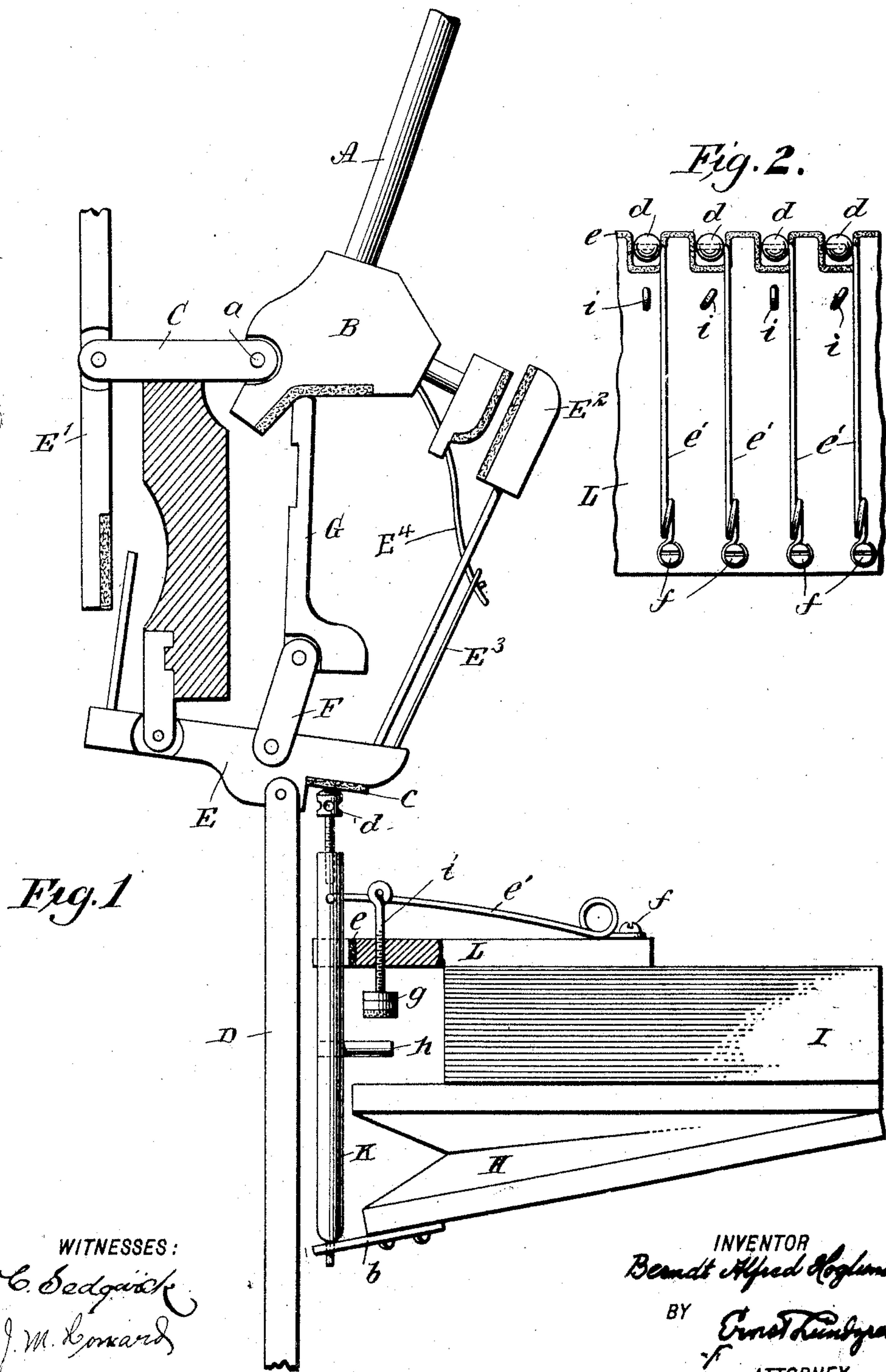
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PNEUMATIC ACTION FOR MECHANICAL MUSICAL INSTRUMENTS.

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PNEUMATIC ACTION FOR MECHANICAL MUSICAL INSTRUMENTS.

No. 881,403.

Specification of Letters Patent.

Patented March 10, 1908.

Application filed February 7, 1906. Serial No. 299,947.

To all whom it may concern:

Be it known that I, BERNDT ALFRED HOGLUND, a citizen of the United States, residing at Williamsbridge, borough of the Bronx, city of New York, New York county, and State of New York, have invented certain new and useful Improvements in Pneumatic Actions for Mechanical Musical Instruments, of which the following is a full, clear, and exact specification, reference being had to the accompanying drawings, and to the reference characters marked thereon.

My present invention relates to the action or the apparatus by which musical instruments having strings to be struck are operated or played by or through the medium of air pressure. The apparatus for accomplishing the necessary movements are called pneumatics and the connections between the pneumatics and the hammers for striking the strings are called pneumatic actions. The pneumatic actions are generally combined with the ordinary actions which are to be operated by the fingers through the medium of keys in the usual way, one set of actions being thrown out of use while the other set is to be employed.

The object of my invention is to provide or produce a pneumatic action easy to be applied in connection with the ordinary action of a musical instrument without interfering in any way with the use or employment of such ordinary action, which is easily adjustable and easily mounted in place for use, and which will operate noiselessly and with a minimum amount of friction so as to render the pneumatic action more sensitive and reliable.

A subordinate object is to render the push rods of the pneumatic action separately removable and capable of being replaced without disturbing any of the other push rods and without moving the pneumatic apparatus.

To accomplish all of the foregoing and to secure other and further advantages in the matters of construction, operation, application and use, my improvements involve certain new and useful arrangements or combinations of parts, peculiarities of construction and principles of operation, as will be herein first fully described and then pointed out in the claims.

In the accompanying drawings forming part of this specification, Figure 1 is a vertical view, partly in section and partly in elevation, of the principal parts of an ordinary

form of action for stringed musical instruments, showing the manner of applying my improvements in connection therewith. Fig. 2 is a plan view of a fragment showing several push rods mounted in the front of the guiding piece and each provided with a spring, omitting other parts of the action.

In both these figures like letters of reference, wherever they occur, indicate corresponding parts.

A represents the hammer arm of one of the ordinary forms of piano actions. This arm carries the striking hammer at its outer extremity and it is mounted in a block, B, pivoted as at *a*, in an arm C. The block B and therefore the arm A, is actuated upon striking one of the keys of the instrument through an abstract, as D, and mechanism intervening between the abstract and the block B. In the particular form of action shown, the abstract D is connected with a hinged arm, E, on which is pivoted a link, F, which engages a bearing piece, G, in such manner that when the abstract D is elevated the piece G will force the block B up from its normal position, to effect the striking. The hinged arm E carries also means for operating the damper, and for compelling the return of the hammer after it has struck a string. E¹ represents a damper-rod, E² a cushioned block to receive the rebound of the hammer, E³ a wire affixed to arm E, and E⁴ a flexible connection between block B and wire E³ to compel return of the hammer. It should be understood that this special form of action is not essential to my invention and may be replaced by any other approved form.

Whatever form of action may be employed, it has a piece or part connected with each abstract, as the hinged arm E, and this is the part against which the force of the supplementary push rod operated by the corresponding pneumatic is applied.

H represents one of the bellows, called a pneumatic in these instruments.

I represents a chest or trunk connecting the pneumatics in one line or series.

K is a push rod operated by the pneumatic for effecting the striking of the hammer. This push rod, as shown, is stepped in a light piece, *b*, applied on the underside of the pneumatic H, so as to be easily disengaged therefrom whenever required. There are, of course, as many push rods K as there are hammers to be struck.

L is the guiding piece for the push rods K, and this is conveniently supported on the trunk I and projects over towards the row of push rods, as indicated.

5 In these actions the hinged arms, E, are inclined downwardly away from their hinges, as indicated in Fig. 1, and the supplementary push rods operated by the pneumatics, as K, are each arranged to bear against a cushion, 10 as at c, through an intermediate head or top, the supplementary push rods not being connected with the levers E, in order that these last named levers may be moved by touching the finger keys without disturbing the push 15 rods of the pneumatic action which would interfere with proper manual playing.

On each push rod K is a head, d, which when in place constitutes a portion of the push rod. This head is made in the form of a 20 capstan screw, as shown, so that it may be easily turned in its seat to regulate the length of the push rod K and thus to adjust the push rod for proper application in connection with the corresponding hinged arm E.

25 The push rods K are guided in part in their vertical movements by being located in open recesses in the front face of the guiding plate L, which recesses are suitably cushioned or felted as represented at e, to prevent noise 30 and friction.

Were the push rod K compelled to move in a vertical line, as when confined in a circular orifice in the guiding plate L, and the hinged arm E forced up, the cushion c would 35 move upon the head of the push rod, thus creating friction and wear and therefore require frequent adjustment of the head. As the hinged arm moves up and down, the bearing point thereon for the head d moves 40 in the arc of a circle of which the center is in the axis of the hinge of the arm. In connection with each push rod K, I employ a spring, as e¹, the same being fastened upon the guiding plate L, as at f, the opposite end 45 of the spring being bent and entered in a small perforation through the push rod. The result of this arrangement is that when the push rod is moved up its head is carried in the arc of a circle of which the center is 50 located in some part of the spring. The distance traveled by the head being small, the head will, by the spring, be compelled to remain in contact with the cushion c practically at one point, and therefore friction and 55 wear will be eliminated. The springs e¹ serve also to return the push rods K to their normal depressed position and therefore to keep the bellows H normally distended, affording the possibility of quicker action than 60 when reliance is placed solely on the weight of the lower part of the bellows for the return of the push rod.

The length of stroke of the push rod K is limited by an adjustable stop, as g, the same 65 being provided with a suitable cushion, as

indicated, and the push rod being provided with a projecting arm, as h, to abut against the stop. The stop is conveniently mounted upon a screw, as i which passes down through the turns in its seat in the guide plate L. 70

To remove any one of the push rods K, it is only necessary to bend the spring e¹ slightly to one side; thus withdrawing its bent end from the orifice in the push rod. Then the push rod may be inclined towards 75 the pneumatic and removed from its recess in the front of the guiding plate L without disturbing any of the other push rods and without removing the pneumatic action or interfering with the arm E. Similarly any 80 push-rod may be replaced in working position, the pneumatics having been first located and fixed in the desired position.

The advantages of these facilities of adjustment will be apparent in connection 85 with the manufacture and setting up of the complete instrument as well as in connection with subsequent repairs or adjustments or alterations.

While the improvements are illustrated in 90 connection with an ordinary form of piano action, it is obvious that they may be employed in connection with organ actions or with the actions of any similarly keyed instruments. 95

Having now fully described my invention, what I claim as new herein and desire to secure by Letters Patent, is:—

1. In a mechanical musical instrument, the combination with the pneumatic, of a 100 step piece applied on the bottom of the pneumatic, a removable push rod, a guide for said push rod having a recess open at one side, and a spring detachably connected with the push rod, substantially as and for the pur- 105 poses set forth.

2. In a pneumatic action for mechanical musical instruments, the combination of a removably stepped push rod operated by one of the pneumatics, an adjustable head for 110 said push rod, a guiding plate having a recess open at one side, and a detachable spring, the parts being constructed and arranged substantially as shown.

3. The combination with a pneumatic, of 115 a push rod operated thereby, an adjustable head for said push rod, a guiding plate having a recess open at the rear side for accommodating the push rod, a detachable spring connected with the push rod, an adjustable 120 stop, and an arm on the push rod for striking against said stop, substantially as and for the purposes set forth.

In testimony whereof, I have signed my name to this specification in the presence of 125 two subscribing witnesses.

BERNDT ALFRED HOGLUND.

Witnesses:

C. SEDGWICK,
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