

No. 832,295.

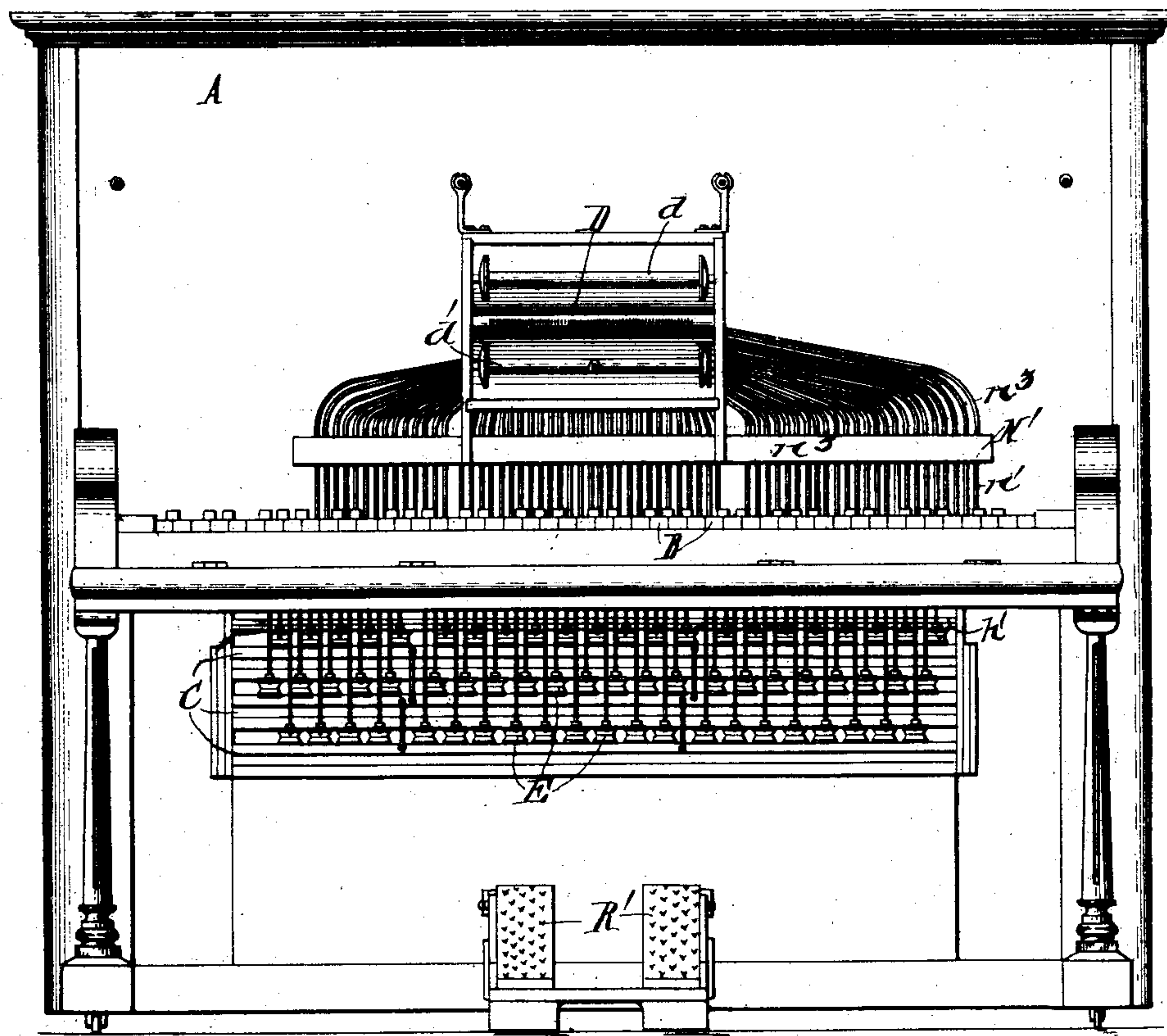
PATENTED OCT. 2, 1906.

J. H. CHASE & W. F. BAYER.
AUTOMATIC MUSICAL INSTRUMENT.

APPLICATION FILED JAN. 31, 1906.

3 SHEETS—SHEET 1.

Fig. 1.



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3 SHEETS—SHEET 2.

Fig. 2.

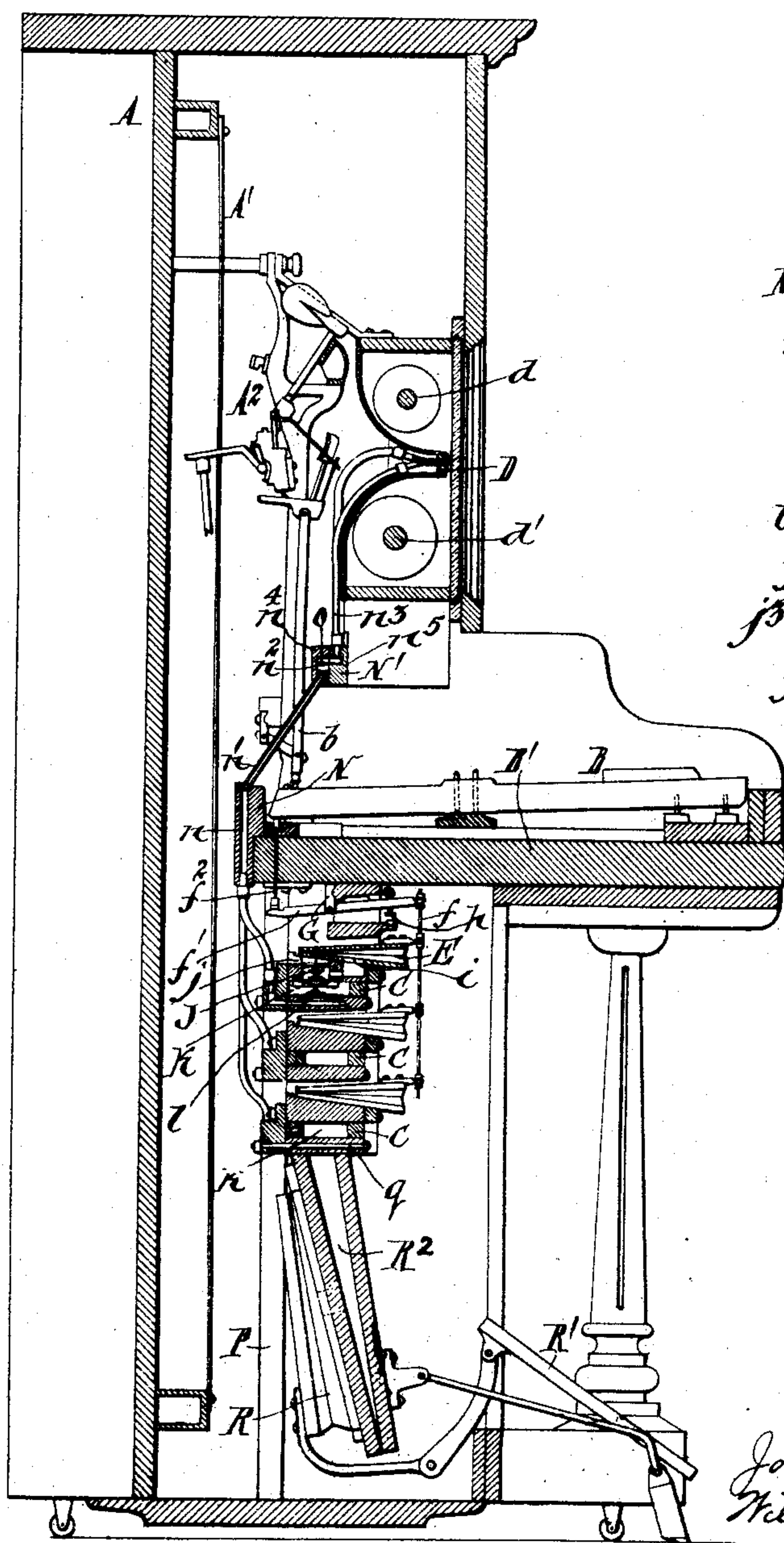
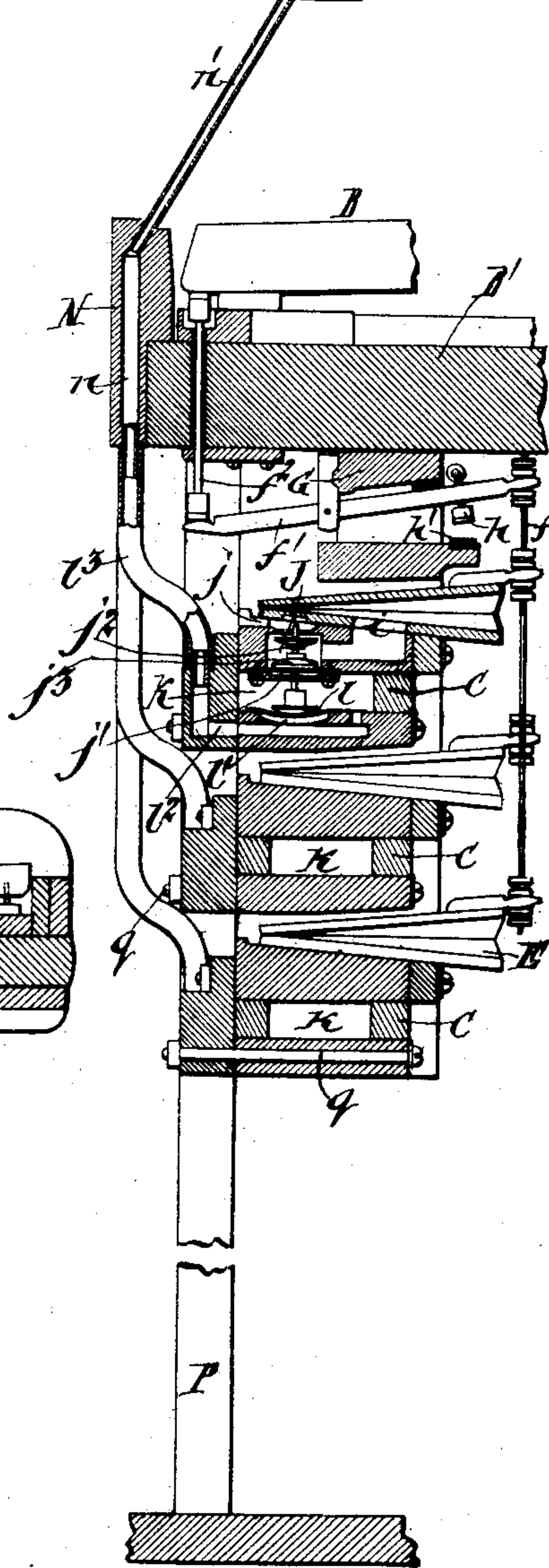


Fig. 3.



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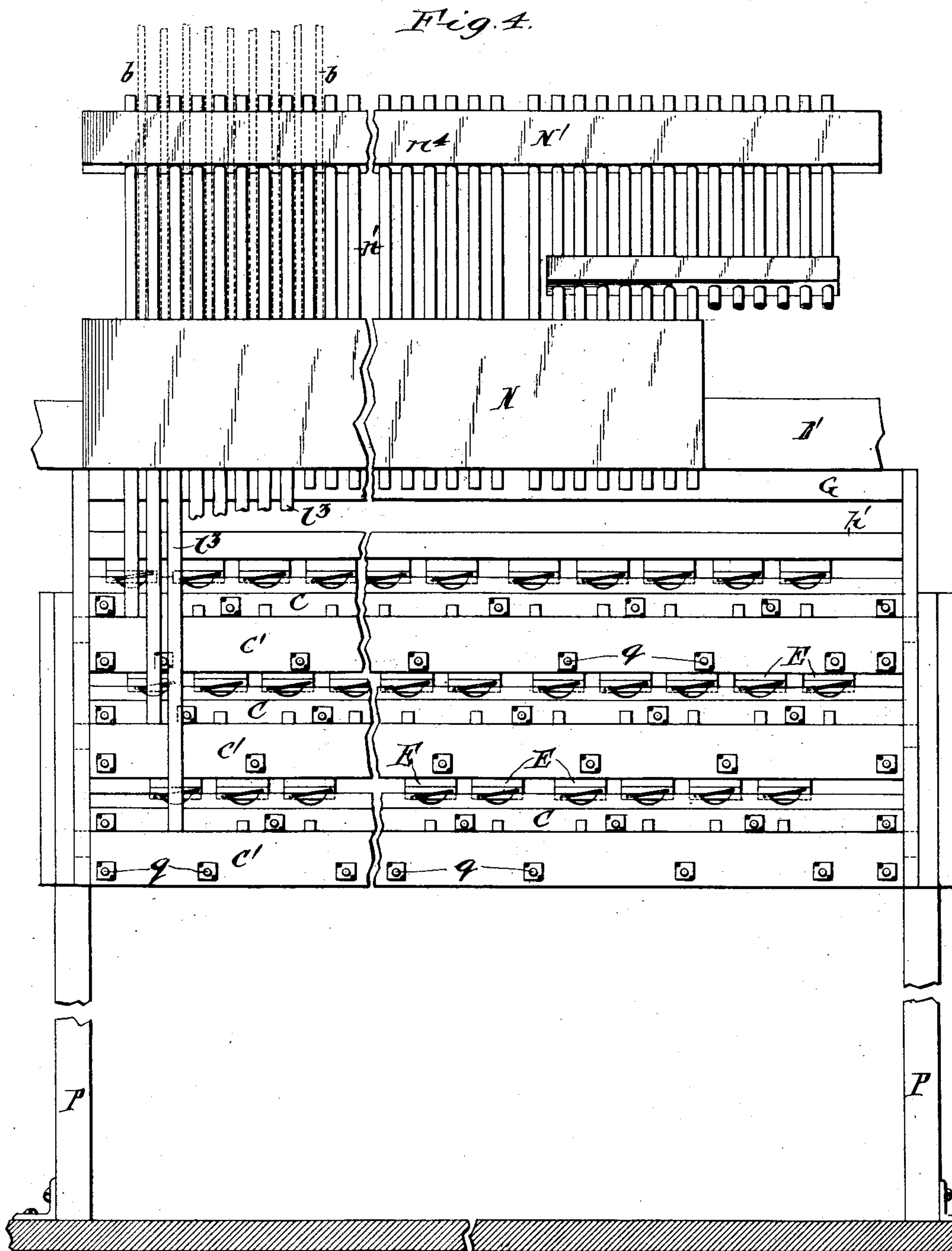
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

JOSEPH HERBERT CHASE AND WILLIAM FREDERICK BAYER, OF BUFFALO, NEW YORK, ASSIGNORS TO THE CHASE & BAKER COMPANY, OF BUFFALO, NEW YORK, A CORPORATION OF NEW YORK

AUTOMATIC MUSICAL INSTRUMENT.

No. 832,295.

Specification of Letters Patent.

Patented Oct. 2, 1906.

Application filed January 31, 1906. Serial No. 298,784.

To all whom it may concern:

Be it known that we, JOSEPH HERBERT CHASE and WILLIAM FREDERICK BAYER, citizens of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Automatic Musical Instruments, of which the following is a specification.

This invention relates to combination-pianos and similar keyed instruments adapted for either manual or automatic operation, and more especially to instruments of this kind employing a pneumatic-action and a perforated music-sheet.

One of the objects of the invention is to so construct the automatic mechanism that it can be applied to and combined with an ordinary piano without interfering with the piano-action or necessitating a reconstruction or rearrangement of its parts and so that the piano-action and the keys can be readily removed for repairs and adjustment without disturbing the automatic action.

A further object is to so organize the pneumatic action that it can be conveniently removed to afford access to the strings for renewing or repairing them.

The invention has the additional object to improve the instrument in other respects with a view of securing a simple and compact construction of its parts.

In the accompanying drawings, consisting of three sheets, Figure 1 is a front elevation of a piano embodying the invention, the panels of the front wall being removed and the parts of the piano-action omitted. Fig. 2 is a transverse central section of the instrument. Fig. 3 is a similar section, on an enlarged scale, of the wind-chest and adjacent parts. Fig. 4 is an enlarged rear view of the last-mentioned parts, a number of the stickers of the piano-action being shown by dotted lines.

Similar letters of reference indicate corresponding parts throughout the several views.

A indicates the sounding-board of the piano, A' the strings, and A² the piano-action, which may be of any ordinary or approved construction. B indicates the keys, also of common construction, B' the key-table, and b the customary rods or stickers for transmitting motion from the keys to the

hammer-operating devices of the piano-action.

C indicates the wind-chests of the automatic attachment, which is arranged in front of the strings and below the key-table.

D is a tracker-board arranged in front of the piano-action A², and d d' are the spool and take-up roller, respectively, upon which the customary music-sheet is wound.

E indicates the motor-pneumatic arranged in horizontal rows at the front side of the wind-chest and having their bases or lower boards secured to the upper sides of the valve-boards or tops of the several wind-chest sections. Each of these pneumatics acts upon one of the piano-keys B through a sticker f, a vertically-swinging lever f', and a second sticker f². This lever is pivoted to the rear side of a longitudinal supporting bar or rail G, secured to the upward extensions of the side walls of the wind-chest and is connected with the movable board of the corresponding motor-pneumatic by the front sticker f. The rear sticker f² passes through a vertical opening in the key-table and rests loosely upon the rear arm of the lever, while its upper end bears against the under side of the rear arm of the piano-key, so that when the pneumatic is collapsed the rear arm of the key-lever is raised and caused to actuate the corresponding hammer of the piano-action. The stroke of each motor-pneumatic is limited by a vertically-adjustable stop or button h, carried by the front arm of the corresponding lever f' and adapted to strike a padded stop-bar h', arranged below the supporting-bar G and secured to the side walls of the wind-chest, as best shown in Fig. 3. By the use of these adjustable stops the stroke of the piano-keys produced by the pneumatic action can be regulated to correspond to that produced by the keys when operated manually, and the stroke of the keys can be limited to prevent their being raised so far as to interfere with the proper recoil of the hammers.

Each pneumatic E is connected by a channel i with a valve-chamber J, which communicates with the atmosphere by an upper air-port j and with an exhaust-chamber k by lower exhaust-ports j'. These two ports are controlled by a double puppet-valve j² j³, operating to close one port when the other is

opened, so as to alternately collapse and expand the pneumatic in a well-known manner. The stem of the puppet-valve rests upon a diaphragm or pneumatic l , covering a chamber l' , which communicates with an air-channel l^2 . Each of the channels l^2 is connected with one of the ducts of the tracker-board, preferably by a flexible tube l^3 , a passage n , a metallic tube n' , a chamber n^2 and a flexible tube n^3 . The passages n are formed in a lower horizontal bar or rail N , which is secured to the rear edge of the key-table B' , while the chambers n^2 are formed in an upper horizontal bar or rail N' , which is rigidly connected with the bar N by the metallic tubes n' . These tubes and the upper and lower bars N N' constitute a tracker-frame or comb, and the tubes are properly spaced to permit the stickers b of the piano-action to pass freely between the same, as shown by dotted lines in Fig. 4. The upper bar N' is located on the front side of these stickers, and the tubes n' incline rearwardly from the bottom of said bar to the top of the lower bar N .

As best shown in Fig. 3, each chamber n^2 of the bar N' is divided by a fine gauze diaphragm or strainer o into upper and lower compartments, with which the corresponding tracker-tubes n' and n^3 are respectively connected, this diaphragm serving to prevent the entrance of dust, lint, &c., into the wind-chest. The bar N' is preferably divided vertically and longitudinally into front and rear sections n^4 n^5 , and the intercepting diaphragms o are arranged in the portions of the chambers n^2 , formed in the rear section. The wind-chest is supported by a pair of uprights P , arranged at opposite sides of the instrument and extending from the key-table to the bottom of the piano-case. The back boards C' of the wind-chest sections, to which the flexible tubes l^3 are connected, are permanently secured to these uprights, while the remaining portions of said sections are separable from the back boards and removably secured thereto by transverse bolts q , the channels l^2 , connected with the tracker-ducts, being formed partly in the removable front portion and partly in the fixed rear portion of the wind-chest, as shown.

R is the exhaust-bellows operated by the usual pedals R' or other suitable means, and R^2 is an air-chamber connected with said bellows and communicating with the several exhaust-chambers k of the wind-chest in a common manner. The chamber R^2 is suitably secured to the under side of the wind-chest. When the instrument is played by hand, the keys operate directly on the stickers b of the piano-action in the ordinary manner, the pneumatic action remaining inoperative, inasmuch as its stickers f^2 have no connection with the keys. When the instrument is operated automatically by the

use of the perforated music-sheet, the motor-pneumatics are exhausted and collapsed whenever the corresponding ducts of the tracker-board are uncovered in a manner common to this class of actions, thereby rocking the corresponding levers f' and operating the companion piano-hammers through the medium of the lower stickers f^2 , the piano-keys, and the upper stickers b .

By the improved construction and arrangement of the parts above described any of the keys can be removed for repairing the same without disturbing any of the parts of the piano-action or the pneumatic action, and the piano-action can also be taken out of the case without interfering with or requiring the removal of the tracker-tubes or other parts of the pneumatic action, the metal tubes n' and the rails N N' remaining permanently in place and permitting the ready withdrawal of the stickers b from between the same. Likewise the main or front portion of the wind-chest, together with the levers f' , the motor-pneumatics, and the exhaust-bellows R , carried by it, can be removed by simply removing the bolts q and detaching the exhaust-bellows from the pedals, thus permitting the wind-chest and the strings to be conveniently repaired without disturbing or disconnecting the tracker-tubes from the back boards C' of the wind-chest.

Our improvements are applicable to combined manual and automatic organs as well as pianos, and the term "piano-action" used in the claims comprehends the equivalent sound-producing parts or action of an organ.

We claim as our invention—

1. The combination of the sound-producing parts, a tracker-board, a wind-chest composed of a fixed rear section and a removable front section, motor-pneumatics for the sound-producing parts mounted on the removable section of the wind-chest, valve mechanism in the wind-chest controlling the passage of the air to and from said pneumatics, and tracker connections extending from the tracker-board to the fixed section of the wind-chest, substantially as set forth.

2. The combination with the piano-action and the manual-keys, of a tracker-board, a wind-chest arranged below the keys and composed of a fixed rear section and a front section removably secured to the rear section, motor-pneumatics mounted on said removable section, levers also carried by said removable section and operatively connected with the pneumatics, and stickers interposed between said levers and the piano-keys, substantially as set forth.

3. The combination with the piano-action and the manual-keys, of a tracker-board, a wind-chest arranged below the keys and composed of a fixed rear section and a front section removably secured to the rear section,

motor-pneumatics mounted on the front portion of the removable section and having their movable boards arranged above their fixed base-boards, levers carried by said removable section and arranged between the top thereof and the rear portion of the key-table, the front arms of said levers being connected with the respective pneumatics, and stickers passing through the rear portion of the key-table and bearing loosely against the under sides of the keys and against the rear arms of said levers, substantially as set forth.

4. The combination with the piano-action, the keys and the key-table, of a tracker-board arranged above the keys, a wind-chest arranged below the key-table, motor-pneumatics acting on the keys, valve mechanism in the wind-chest controlling the passage of the air to and from the pneumatics, and a

tracker-frame or comb comprising an upper bar arranged on the front side of the piano-action and having air passages or chambers connected with the ducts of the tracker-board, a lower bar secured to the key-table in rear of the keys and having passages connected with the wind-chest, and rigid tubes secured at their ends to said bars and connecting corresponding passages thereof and passing between the stickers of the piano-action, substantially as set forth.

Witness our hands this 18th day of January, 1906.

JOSEPH HERBERT CHASE.

WILLIAM FREDERICK BAYLER.

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