

No. 780,411.

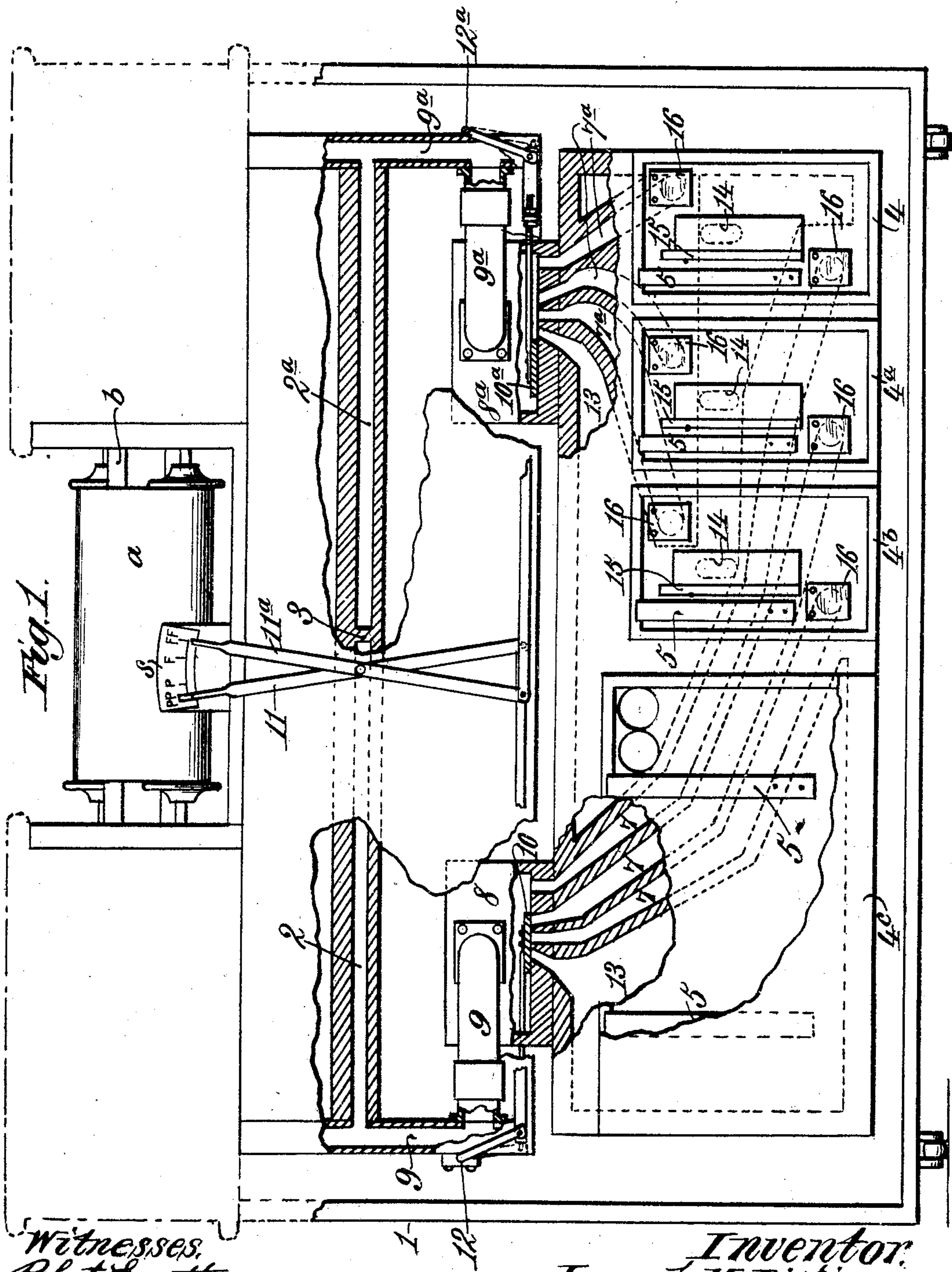
PATENTED JAN. 17, 1905.

J. H. DICKINSON.

MEANS FOR CONTROLLING THE TENSION IN WIND WAYS OF MECHANICAL
MUSICAL INSTRUMENT PLAYERS.

APPLICATION FILED DEC. 7, 1903.

2 SHEETS—SHEET 1.



Witnesses,
Robert Smith,
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Inventor,
Joseph H. Dickinson.
By James L. Norris,
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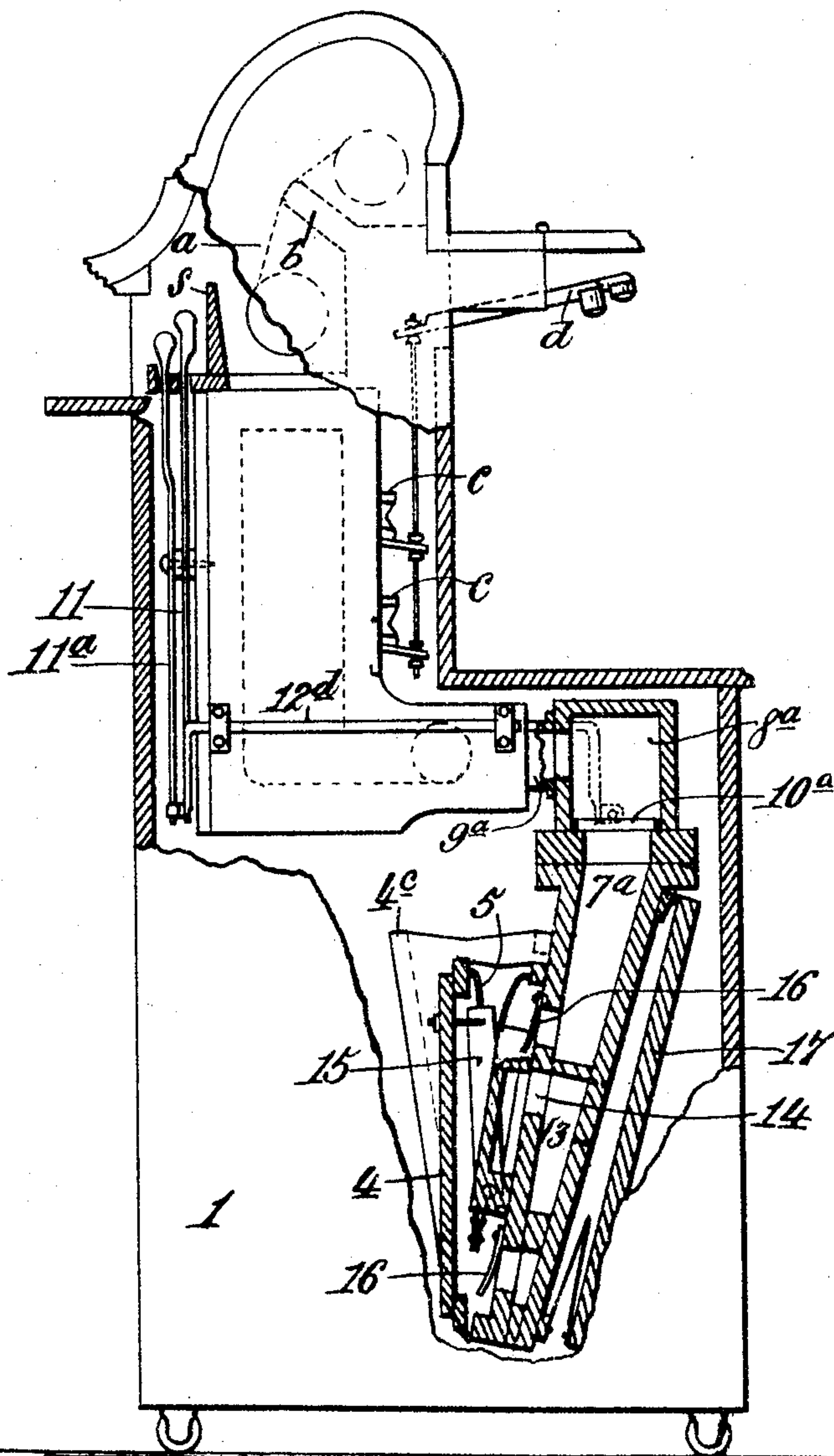
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2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

JOSEPH H. DICKINSON, OF GARWOOD, NEW JERSEY.

MEANS FOR CONTROLLING THE TENSION IN WIND WAYS OF MECHANICAL-MUSICAL-INSTRUMENT PLAYERS.

SPECIFICATION forming part of Letters Patent No. 780,411, dated January 17, 1905.

Application filed December 7, 1903. Serial No. 184,163.

To all whom it may concern:

Be it known that I, JOSEPH H. DICKINSON, a citizen of the United States, residing at Garwood, in the county of Union and State

5 New Jersey, have invented new and useful of Improvements in Means for Controlling the Tension in the Wind Ways of Mechanical-Musical-Instrument Players, of which the following is a specification.

10 My invention relates to means for controlling the tension in the wind ways of an automatic musical-instrument player having a divided wind-chest, and has for its object to provide a novel arrangement of control including operating-levers the free ends of

15 which are exposed for manipulation by the operator and are so related that they may be grasped between the finger and thumb and moved as a unit in relation to an indicating-scale to produce an equal tension in the treble and bass chambers of the wind-chest to secure the same expression of notes, simultaneously or successively sounded, in the treble and

20 bass subdivisions of the scale, or may be independently manipulated to produce different expressions of notes simultaneously or successively sounded in the treble and bass subdivisions of the scale.

The invention has also for its object to

30 otherwise improve the means for controlling the tension in the wind-chest for regulating or determining the expression of the musical notes or sounds.

By my invention I provide a new means and arrangement of means whereby perfect control operable with great facility and in a simple way is secured.

To the end stated the invention consists in the novel combination of parts and in the arrangement of parts hereinafter described and

40 claimed.

In the accompanying drawings, illustrating the preferred and best-known embodiment of my invention, Figure 1 is a view, partly in elevation and partly in section; and Fig. 2 is a vertical section taken through one of the tension-regulators.

In the said drawings the reference-numeral 1 designates a suitable casing containing the

50 operative parts, 2 2^a the treble and bass cham-

bers of a divided wind-chest, and 3 the dividing-partition. The chamber 2 of the wind-chest is common to all of the motor-pneumatics of the bass register of the scale and the chamber 2^a is common to all of the pneumat- 55 ics of the treble register of the scale. The arrangement of the motor-pneumatics and the communication therewith of the wind-chest chambers are not shown or described in detail, as such arrangement and means of 60 communication may be any of the well-known arrangements.

The numerals 4, 4^a, 4^b, and 4^c designate a series of tension-producers, which, as shown in the drawings, consist of exhausters of any 65 suitable known construction, the operating-springs 5 of which are of different strength or tension. Each of said tension-producers has controllable communication with each chamber of the wind-chest, with one chamber 70 by way of a series of wind ways 7 and with another chamber by way of a series of wind-ways 7^a. The series of wind ways 7 communicate with a valve-casing 8, which in turn communicates with the bass chamber 2 of the 75 wind-chest by means of the passage 9. The series of wind ways 7^a communicate with a valve-casing 8^a, which in turn communicates with the treble chamber 2^a of the wind-chest by means of a passage 9^a. Within the valve- 80 casings 8 8^a are independently-operable slide-valves 10 10^a, arranged to open and close in succession the corresponding series of wind-ways 7 7^a. These valves are held to their seats by the air tension existing in the vacu- 85 um-chest 13, whereby they are caused to close with nicety the several wind ways of the series of wind ways in connection with which they are arranged, preventing leakage of such wind ways as may from time to time in ma- 90 nipulation of the valves be closed, with the result that the selected exhauster or exhausters required to give a given expression shall be in circuit with the wind-chest and leakage past the valves into the closed wind ways pre- 95 vented, whereby the exact expression desired may be secured. The independent valves 10 10^a are connected to operating mechanism capable of being manipulated as a unit to establish communication of either of the se- 100

ries of exhausters with both chambers of the wind-chest and also capable of being independently manipulated to establish communication of any desired exhauster with one
 5 chamber of one wind-chest and any other desirable exhauster with the other chamber of said chest. This valve-operating mechanism consists of levers 11 11^a, pivoted together intermediate their ends. These levers are connected by intermediate elements (shown as
 10 crank-shafts 12 12^a) to the respective valves 10 10^a. The free or handle ends of these levers are exposed for manipulation and sustain such relation of propinquity that they may
 15 with facility be grasped between the thumb and finger of the operator and move as a unit in relation to a guide or indicating-scale *s* or may be manipulated independently of each other, as described. When the handle ends of
 20 the levers 11 11^a are moved as a unit to cause a selected exhauster or exhausters to have communication with both chambers of the wind-chest to produce a like expression in the
 25 bass and treble registers, it will be observed that the wind way of the series 7 in communication with the selected exhauster and the corresponding wind way in the series 7^a, having
 30 communication with said exhauster, are opened, and so in succession throughout the series of wind ways when the handles are moved as a unit. On the other hand, the said
 35 valves and their operating mechanism may be moved independently, so that, for example, a pianissimo expression can be produced in the bass register and a forte expression in the
 40 treble. In other words, any expression within the range of capability of the mechanism may be produced in the bass and any other expression in the treble register, or like expressions may be produced in both registers.

It is designed, according to the particular embodiment of the invention shown in the drawings, that the high-tension producer 4^c shall be in normal communication with the
 45 vacuum-chest 13 common to all the tension-producers, the others or lower of said tension-producers 4, 4^a, and 4^b having communication with said vacuum-chest by way of passages 14, controlled by automatically-acting valves
 50 15. These valves are suitably mounted—for example, as shown in Fig. 2—and the free ends thereof are connected to the movable elements of the tension-producers, the arrangement being such that when the exhausters are in
 55 action and have completed their work the passages or ports 14 are opened, placing said exhausters in communication with the vacuum-chest 13, whereupon they are exhausted through said passages or ports and collapsed.

The said lower-tension producers are provided with inwardly-opening check-valves 16, that cover their respective wind ways 7 7^a when said producers are not in action, whereby when the high-tension producer is oper-
 60 ative or in action the said check-valves close

the wind ways leading to said lower-tension producers and prevent high-tension producer from drawing or endeavoring to draw air from said lower-tension producers, to the end that
 70 the high-tension producer will exert its influence on the wind-chest chamber or chambers with which it is in communication unimpaired. The low-tension producers are graded, as explained, and when any one thereof higher
 75 in grade than the relatively weaker ones is brought into action the check-valves of said relatively weaker one will operate in the manner explained in describing their action when the high-tension producer is in action. It
 80 will be observed that these check-valves co-operate with the valves 10 10^a to secure the certain production in the wind-chest of a selected degree of tension. By moving the levers 11 11^a to bring their handles opposite
 85 any given mark on the indicating-scale *s* the production of the same tension in both chambers of the wind-chest is secured. By moving said handles opposite different indicia of the scale different tensions are secured in the
 90 respective chambers of the wind-chest.

In illustrating my invention I have shown the same embodied in connection with an automatic piano-player operated by appropriate music-sheet *a*, which passes over a well-known
 95 tracker-board *b*, having the well-known and not-illustrated communication with motor-pneumatics *c*, a portion of two of which are shown in Fig. 2 of the drawings and which are operatively connected to key-striking fingers *d*, and in describing the operation of my
 100 invention reference will be had to said embodiment.

In operation where a piece of music being played requires that notes or a sequence of
 105 notes in the treble and bass registers of the scale shall have the same expression—say forte—the operator may with ease and facility grasp the handles of the levers and move them as a unit opposite the indicia *F* on the
 110 scale, and through the connected mechanism and valves communication is established between the wind-chest chambers and the appropriate tension-producer, the action of which tension-producer effects the desired expression. The handles may as a unit be
 115 moved back and forth in front of the indicating-scale to produce any desired tension in both chambers of the wind-chest. On the other hand, if a note or succession of notes in the treble and bass divisions are to have different
 120 expressions the operator may manipulate the handles independently, adjusting them upon the scale to the appropriate indications corresponding to the expressions desired. For instance, if a piano expression is
 125 desired in the bass register and a forte expression in the treble register the handle 11 will be moved to the indication *P* and the handle 11^a to the indication *F*, whereby through the connected mechanism and the valves the
 130

appropriate tension-producers to effect these expressions will be brought into operation.

By my invention great variety of expression is afforded and the expression may be perfectly controlled with great ease and facility by the operator of the instrument. By the provision of the graded tension-producers, each of which has controllable communication with both chambers of the wind-chest and independent valves for controlling the communication of the tension-producers with the wind-chest chambers, said valves being actuated by hand-levers exposed for manipulation and so arranged that they may be grasped by the thumb and finger of the operator and be moved as a unit in front of a registering-scale or be independently manipulated, variety, perfection, and facility of control are attained, and the practical operation of mechanical-musical-instrument players is greatly improved and their value and desirability largely enhanced.

Having thus described my invention, what I claim is—

1. In a mechanical - musical - instrument player, the combination of a divided wind-chest, a series of graded tension-producers, a series of wind ways having communication with one wind-chest chamber and also with said graded tension-producers, another series of wind ways having communication with another chamber of the wind-chest and also with said tension-producers, a slide-valve arranged to open and close, in succession, the several wind ways of one series of wind ways, an independent slide-valve arranged to open and close, in succession, the several wind ways of the other series of wind ways, valve-manipulating levers connected to said valves for operation thereof, the free ends of said levers being exposed for manipulation and arranged in nearness to each other whereby they may be moved as a unit or independently.

2. In a mechanical - musical - instrument player, the combination of a divided wind-chest, a series of graded tension-producers, a series of wind ways having communication with one wind-chest chamber and also with said graded tension-producers, another series of wind ways having communication with another chamber of the wind-chest and also with said tension-producers, a slide-valve arranged to open and close, in succession, the several wind ways of one series of wind ways, an independent slide-valve arranged to open and close, in succession, the several wind ways of the other series of wind ways, a scale, valve-manipulating levers connected to said valves

for operation thereof, the free ends of said levers being exposed for manipulation and arranged in nearness to each other whereby they may be moved as a unit or independently in relation to said scale.

3. In a mechanical - musical - instrument player, the combination of a divided wind-chest, a series of graded tension-producers, a vacuum-chest with which said tension-producers are arranged to have communication, a series of wind ways having communication with one wind-chest chamber and also with said tension-producers, another series of wind ways having communication with another chamber of the wind-chest and also with said tension-producers, a slide-valve arranged to open and close, in succession, the several wind ways of one series of wind ways, an independent slide-valve arranged to open and close, in succession, the several wind ways of the other series of wind ways, said slide-valves held to their seats by tension within the vacuum-chest, valve-manipulating levers connected to said valves for operation thereof, the free ends of said levers being exposed for manipulation and arranged in nearness to each other whereby they may be moved as a unit or independently.

4. In a mechanical - musical - instrument player, the combination of a divided wind-chest, a series of graded tension-producers, a vacuum-chest with which said tension-producers are arranged to have communication, a series of wind ways having communication with one wind-chest chamber and also with said tension-producers, another series of wind ways having communication with another chamber of the wind-chest and also with said tension-producers, a slide-valve arranged to open and close, in succession, the several wind ways of one series of wind ways, an independent slide-valve arranged to open and close, in succession, the several wind ways of the other series of wind ways, said slide-valves held to their seats by tension within the vacuum-chest, valve-manipulating levers pivoted together intermediate their ends and connected to said valves for operation thereof, the free ends of said levers being exposed for manipulation and arranged in nearness to each other whereby they may be moved as a unit or independently.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOSEPH H. DICKINSON.

Witnesses:

W. C. MANSFIELD,
E. C. THOMPSON.