No. 747,551. PATENTED DEC. 22, 1903.

G. W. HAYWOOD.

AUTOPNEUMATIC MUSIC PLAYING INSTRUMENT.

APPLICATION FILED JUNE 1, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

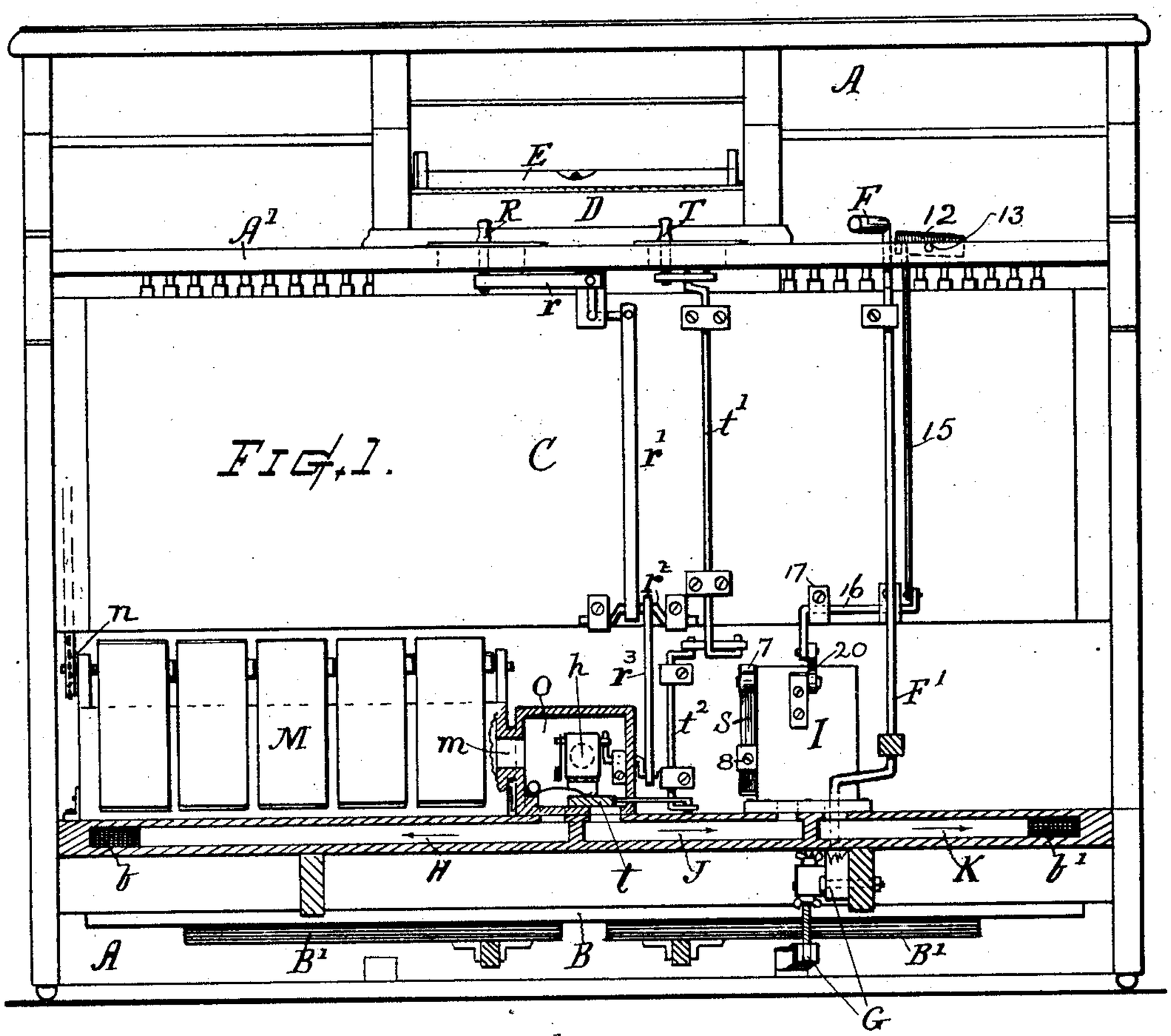

FIG. 1.

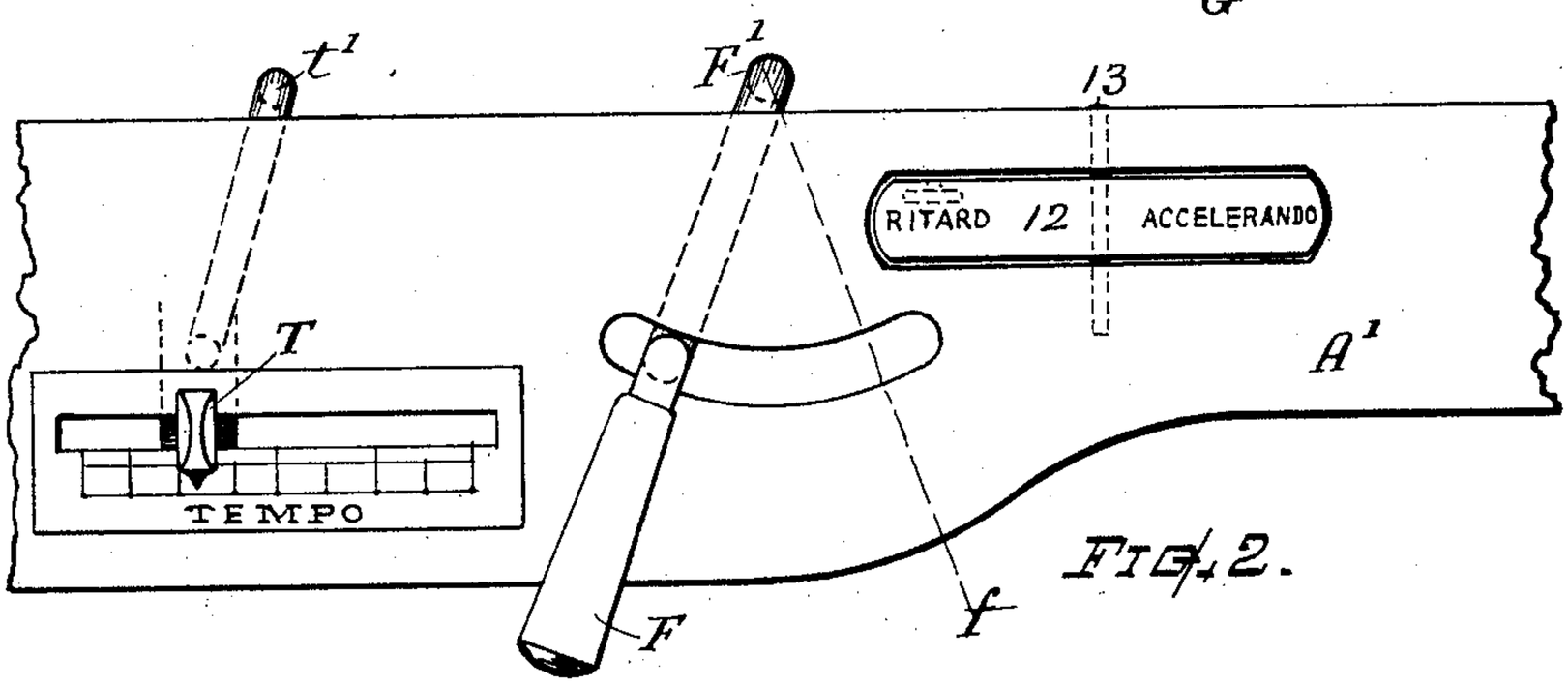

FIG. 2.

Witnesses.
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NO MODEL. 2 SHEETS—SHEET 2.

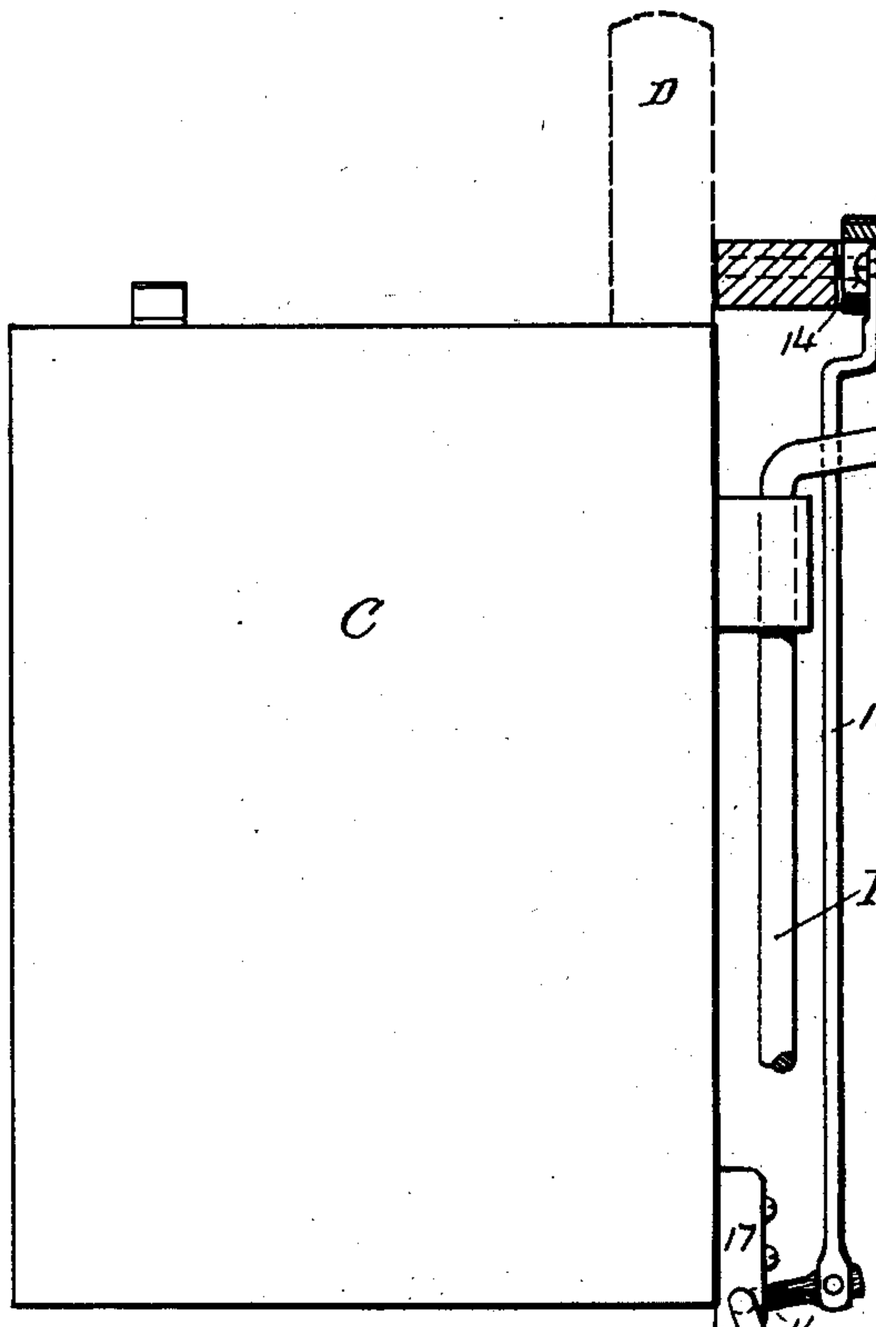


FIG. 5.

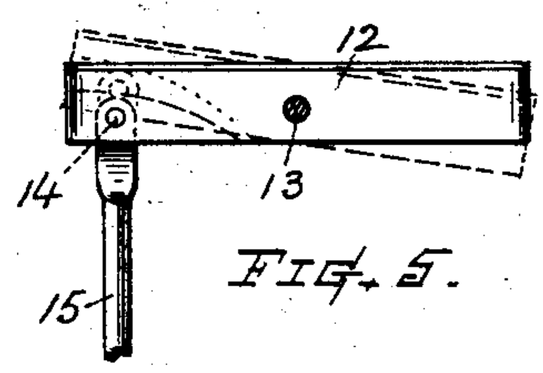


FIG. 4.

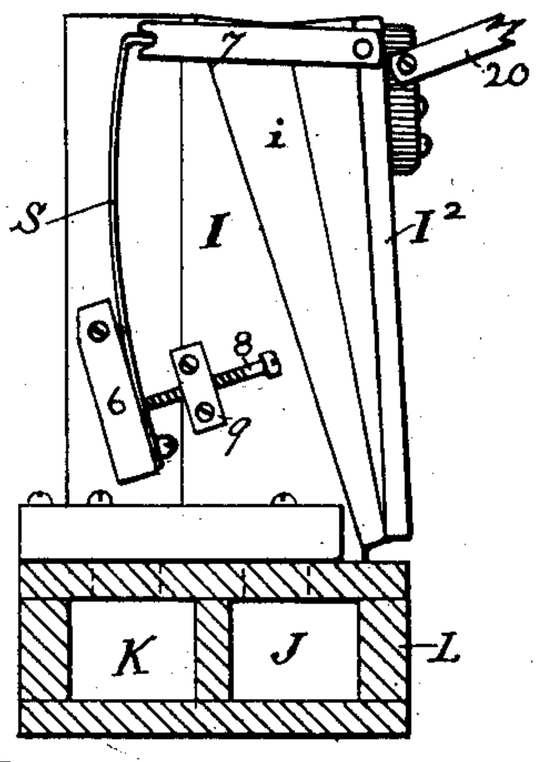
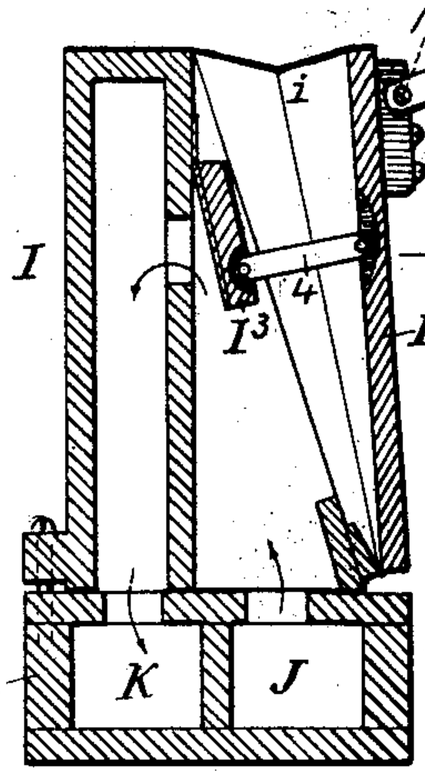


FIG. 3.



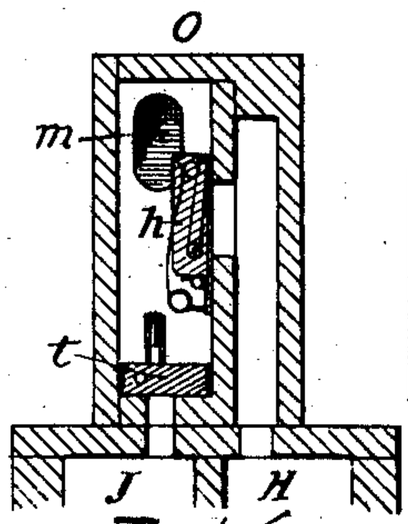


FIG. 6

Witnesses
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No. 747,551. Patented December 22, 1903.

UNITED STATES PATENT OFFICE.

GEORGE W. HAYWOOD, OF MERIDEN, CONNECTICUT, ASSIGNOR TO WILCOX & WHITE COMPANY, OF MERIDEN, CONNECTICUT, A CORPORATION OF CONNECTICUT.

AUTOPNEUMATIC MUSIC-PLAYING INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 747,551, dated December 22, 1903.

Application filed June 1, 1903. Serial No. 159,450. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. HAYWOOD, a citizen of the United States, residing at Meriden, in the county of New Haven and State of Connecticut, have invented a new and useful Improvement in Autopneumatic Music-Playing Instruments, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

This invention relates to autopneumatic music-playing instruments—such as automatic pianos, piano-players, automatic organs, &c.—wherein there are employed a traveling music-sheet, operating mechanism, a pneumatic motor-engine for supplying power for the advancement of the music-sheet across the tracker, and a pneumatic regulator for governing the speed of said motor-engine, but more particularly to the construction and combination of means for enabling the operator supplementary to the general tempo-adjustment devices to modify and control the tempo regulation at desired places in the music, a prime object of my invention being to provide a simple, efficient, and convenient means whereby the operator can temporarily accelerate or retard the tempo-action without interfering with the established adjustment of the general tempo-stop as arranged for any particular musical composition.

Another object is to provide, in combination with an automatic pneumatic regulator that governs the supply of air to the motor-engine in a pneumatic music-playing instrument, of a controlling means adapted for temporarily increasing and decreasing the effective tension of the regulator-pneumatic above or below its normal tension.

Another object is to provide, in combination with an expression-stop or controlling mechanism, a tiltable finger-operative tablet or device and connections therefrom adapted for controlling the tempo-regulator and disposed for convenient manipulation in conjunction with said expression-stop.

The nature and operation of mechanism whereby I attain these objects are illustrated in the accompanying drawings, wherein—

Figure 1 represents a front-view diagram of such parts of an autopneumatic music-playing instrument as embody my invention. Fig. 2 is a top view, on somewhat larger scale, showing the relative arrangement of the controller-tablet, the accentuation-stop lever, and tempo-adjuster. Fig. 3 represents a transverse vertical sectional view of the pneumatic regulator and a side view of the controller connections. Fig. 4 represents a side view of the regulator-pneumatic and its tension-spring. Fig. 5 is a separate front view of the tiltable finger-tablet, and Fig. 6 shows a vertical transverse section of the gate-box and valves for the motor-exhaust passages.

Referring to the drawings, A denotes the frame or casing, B the bellows-reservoir, and B′ the exhausters for inducing vacuum or air pressure; C, the wind-chest containing the series of pneumatic-actions; D, the tracker; E, the music-winding spool, and F the stop or handle-lever for operating the soft-pedal-actuating mechanism at G. All of said parts may be of well-known or any suitable construction, and therefore need not be herein more fully shown and described.

M indicates a pneumatic motor-engine of suitable kind for supplying power to operate the music-sheet-winding mechanism. Said motor-engine is connected with the bellows-reservoir B by a direct passage H, controlled by the reroll stop-valve *h*, and with the pneumatic regulator I by an air-passage J, controlled by the tempo-adjusting valve *t*, and said regulator is connected to the bellows-reservoir by a passage K, the air being drawn from the motor through the regulator when the instrument is in playing operation, as heretofore practiced. These passages may be disposed in the bottom conductor L in any convenient manner, as side by side, as shown in Figs. 3 and 4 or as in Fig. 1, wherein they are shown as end to end for clearness of illustration and with openings into the reservoir at *b b′* or at other convenient position. In the present instance the valves *h* and *t* are arranged within a gate-box O, which is

disposed adjacent to and connected with the motor M by a passage *m;* but, if desired, said valves can be arranged in other well-known or suitable manner. The valve *h* is operated by the reroll-stop R and suitable connections *r*, *r'*, r^2, and r^3. The valve *t* is operated by the tempo-stop T and suitable connections *t'* t^2, by which said valve *t* can be adjusted for giving the proper tempo or time for any musical composition.

The regulator I, which consists of a two-chambered box connected with the passages J and K, comprises a pneumatic device having a movable member or hinged back piece I^2 and flexible bellows-fold sides *i* and an interior valve I^3, linked to the movable member, as at 4, is arranged for partially closing, more or less, a windway between the chambers by the collapse or expansion movement of the movable member I^2 of the pneumatic under the influence of the induced vacuum and the resistance of the tension-spring, as heretofore practiced.

S indicates the resistance or tension spring of the regulator. Said spring may be arranged in any suitable manner, but is preferably made, as shown, with its lower end attached to a block 6, pivoted on the exterior of the regulator-box and its upper end resting against an arm 7, pivoted to the upper part of the movable member I^2 of the pneumatic. A screw 8, threaded in a stationary block 9 and impinging against the spring S, (see Fig. 4,) serves for establishing the tension or normal resistance of the regulator-pneumatic to the exhaust influence of the wind-inducing apparatus.

As a feature of my invention I combine with the regulator-pneumatic means for temporarily applying force in augmentation of or in opposition to the influence of the resistance-spring for thereby causing the regulator for the time being to act at a higher or lower pressure or tension. This means in the present instance consists of a tilting finger-pressible tablet or lever 12, fulcrumed at 13 in the front part or run-board A' of the case and adjacent to the pedal-actuating handle or lever F. Pivoted to one end of said tilting tablet at 14 there is a connecting-rod 15, the other end of which is joined to one arm of a cranked wire or rocker 16, fulcrumed in bearings 17 on the wind-chest C or other suitable support and having its other arm connected by a bar or rod 20 and pivot-joints 18 and 19 to the movable member or back piece I^2 of the regulator-pneumatic, as best shown in Fig. 3. The top face of the tiltable tablet 12 is marked "Ritard" at one end and "Accelerando" at the other end or with such other appropriate indicating-marks as may be in any instance desired. The tablet 12 is preferably disposed in such near relation to the handle-lever F that said lever and the tablet can be depressed by the finger while the handle-lever is simultaneously held or manipulated, as desired, by one and the same hand.

The pedal-operating mechanism at G is constructed of known form and is actuated by a crank lower end of the rod F', which is worked by the handle-lever F, swung around to the dotted line *f*. (Shown on Fig. 2.)

In the operation the "tempo-stop" can be set at any desired position, thereby establishing an adjustment of the valve *t* that will give the general tempo for the particular piece of music—quick, moderate, or slow, as the case may be—and with the motor M running under the air-pressure maintained by the normal regulator tension. Then at any part of the music the time can be quickened by the operator pressing a finger upon the accelerando end of the tablet 12 and tilting it, as indicated by dotted lines in Fig. 5, the movement and pressure being transmitted through the connections 15, 16, and 20 to the regulator-pneumatic I^2 and causing said pneumatic to resist the closing action of the air-pressure to a somewhat greater degree than is effected by the normal resistance of the tension-spring alone. In similar manner by pressing a finger upon the ritard end of the tablet the force thereof, acting through the connections, tends to force inward the movable member of the pneumatic in opposition to the spring and contract the passage, thereby causing a less amount of air to flow through the motor and decreasing its speed of action beyond the degree effected by the spring alone. When the finger is raised from the tablet, the speed at once assumes the originally-established tempo, since there has been no disturbance in the adjustment of the tempo-stop T and valve *t* operated thereby.

As I am aware that changes may be made in the construction of my invention by those skilled in the art without departing from the nature and scope thereof as expressed in the claims, I do not wish to be limited to the particular forms and construction herein shown.

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

1. In combination, for the purpose set forth, a windway-passage, means for inducing a wind-current therethrough, a valve for controlling said passage, a regulator-pneumatic device internally communicating with said windway-passage, and having a movable member with a connection for moving said valve, a tension-spring for said pneumatic, and an extraneous operating means connected with said pneumatic for temporarily applying force thereto in accord with or in opposition to the normal action of the tension-spring.

2. The combination with a pneumatic regulator comprising a pneumatic having a movable back board, a regulating-valve connected therewith, and a tension-spring for expanding said pneumatic, of a manually-operated

means connected therewith for applying force in opposition to or augmentation of the spring-pressure.

3. In an autopneumatic music-playing instrument, in combination with a pneumatic regulator comprising a pneumatic chamber having a movable member, a valve operated by said member, and a spring for pressing said member and giving tension for said pneumatic in opposition to the air-pressure exerted thereon, of a manually-operated means independent of said spring for temporarily varying the tension of said regulator-pneumatic for increased or diminished efficiency from the normal spring-exerted tension.

4. The tempo-controller consisting of a tiltable finger-pressible tablet or lever, a rocker device, a rod connecting said tablet and rocker, and a rod connecting said rocker to the movable member of the regulator-pneumatic; in combination with the regulator-pneumatic; the regulator-valve, the motor-engine, and the wind-inducing apparatus in an autopneumatic music-playing instrument.

5. In a mechanical music-playing instrument, the combination, of a motor-engine, wind-inducing apparatus, a tempo-adjusting valve and actuating-stop therefor, a regulator-pneumatic, a regulator-valve operated by said pneumatic for controlling the motor-current, means connected with said regulator-pneumatic for temporarily increasing or reducing its effective tension, and a manually-operated device adapted for receiving finger-pressure for actuating said tension-varying means.

6. In an autopneumatic music-playing instrument, in combination with the motor-engine, the tempo-adjusting devices, and pneumatic regulator mechanism for controlling the motor-current; a tiltable finger-pressible device fulcrumed in the run-board, and intermediate connections joining said tiltable device with the movable member of said pneumatic regulator.

7. In an autopneumatic music-playing instrument, in combination with the pneumatic regulator, the tempo-adjusting valve and its actuating-stop, and the pedal-controlling handle and connections for working the soft-pedal mechanisms; of means for temporarily varying the effective tension of the regulator-pneumatic, and a tiltable tablet or device for actuating said means, said tablet disposed at a position near said handle to be reached and operated by the fingers of the hand while holding said handle.

8. In combination, as described, the regulator-box, its pneumatic having the movable back member and regulating-valve connected therewith, the tension-spring mounted on a pivoted block and pressing against an arm pivoted to said movable member, an adjusting-screw for varying the tension of said spring, a rocker or angle lever fulcrumed on a suitable stationary support, a rod connecting one arm of said rocker to the movable regulator member, a tilting finger-pressible tablet fulcrumed in the casing, and a rod connecting said tablet with the other arm of said rocker, for the purposes set forth.

9. In an autopneumatic music-playing instrument, in combination as described, the exhaust-reservoir, the conductor having air-passages leading thereto, the motor-engine, the gate-box connected with said motor-engine and air-passages, and including the reroll-valve and tempo-adjusting valve therein, the reroll-stop and connections, and the tempo-stop and connections for respectively operating said valves, the spring-tensioned pneumatic regulator controlling the motor-current, means for increasing or decreasing the pressure on the regulator-pneumatic, and a rocking tablet-stop, and connections, for operating said pressure-varying means.

10. In an autopneumatic music-playing instrument, a tiltable tablet supported in the run-board or casing, and having a face adapted for receiving finger-pressure thereupon at either end, in combination with a connection or rod united with said tablet, a pressure-regulating pneumatic, and means operated by said tablet and connection rod for increasing and decreasing the resistance tension of the regulator-pneumatic, by the tilt movement of said tablet.

Witness my hand this 28th day of May, 1903.

GEO. W. HAYWOOD.

Witnesses:
F. E. BEMIS,
FRANK C. WHITE.