No. 638,955. Patented Dec. 12, 1899.

J. H. CHASE.

TEMPO INDICATOR AND GOVERNOR FOR MUSICAL INSTRUMENTS.

(Application filed June 30, 1898.)

(No Model.)

Fig. 1,

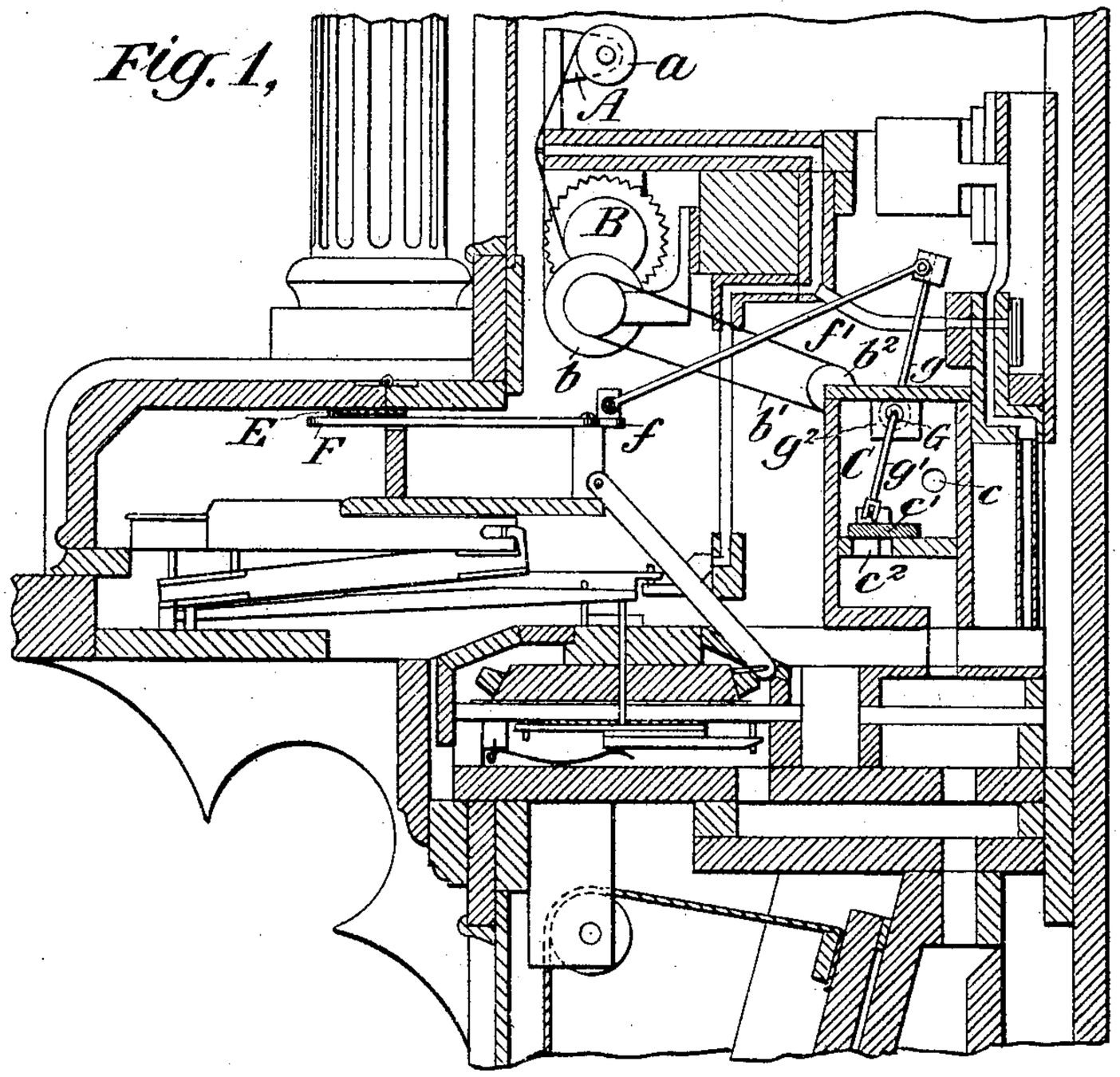


Fig. 2,

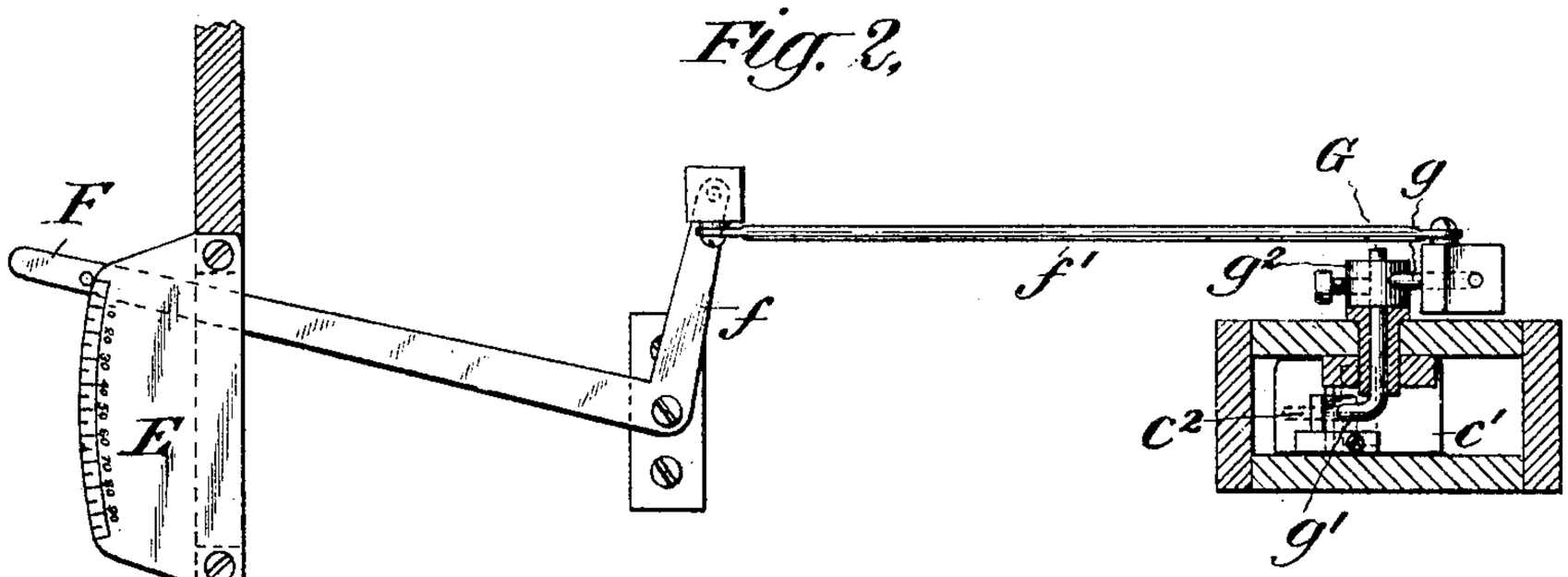
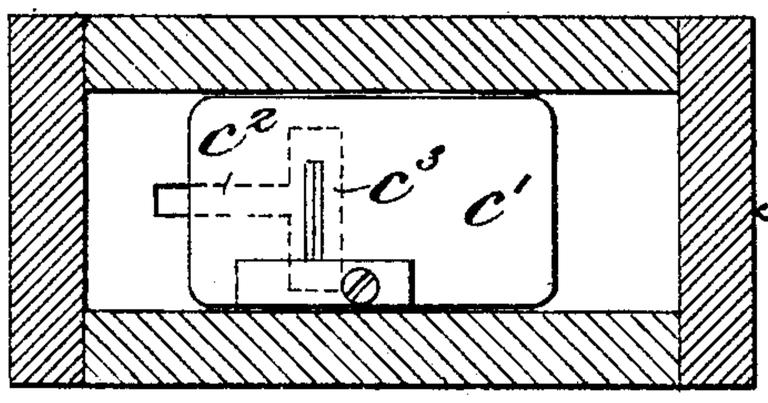


Fig. 3.



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TEMPO INDICATOR AND GOVERNOR FOR MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 638,955, dated December 12, 1899.

Application filed June 30, 1898. Serial No. 684,793. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH HERBERT CHASE, 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 Tempo Indicators and Governors for Musical Instruments, of which the following is a description.

The present invention consists in an improved tempo indicator and governor for musical instruments, and is intended to apply to all forms of pneumatic musical instruments—such, for instance, as the aeolian—wherein the sounding devices are controlled automatically by a perforated music-sheet, the rate of travel of the said music-sheet determining the tempo of the music.

The object of the invention is to provide a means for indicating the speed at which the music-sheet is traveling, which will at the same time regulate the flow of air from the motor to the bellows, and which, as the result of using few parts and only slightly movable connections, will insure a reliable movement of the valve and a quick response to the movement of the indicator-lever.

In the accompanying drawings, Figure 1 is a transverse vertical section of a musical instrument embodying my improvement. Fig. 2 is a detailed top view of my arc-shaped chronometric scale, my combined tempo-indicator and hand-lever, my valve-box, with its opening, my sliding throttle-valve, and the connecting and coöperating parts. Fig. 3 shows the peculiar form of opening in the valve-box and the working of the valve on the said opening.

Similar letters of reference designate corresponding parts in all the figures.

A designates a holder for a spool a, to which spool one end of the music-sheet is permanently secured.

B is a take-up roller to which the free end of the music-sheet is detachably secured. This take-up roller B is engaged by a gear upon a pulley b, driven by a belt b' from a pulley b^2 upon a pneumatic motor employed to propel the music-sheet.

C is an upper supply-chamber with an opening c, through which air is supplied or exhausted to propel the said pneumatic motor.

c' is a sliding throttle-valve working over the opening c^2, thereby regulating the amount of air exhausted or forced through the said opening to or from the bellows and so governing the speed of the said pneumatic motor. The opening c^2 may be shaped as shown in the accompanying drawings, with a wider portion c^3, so that as the valve opens there results a steady increase in the volume of air and a corresponding increase in the rate of speed of the motor until the valve suddenly uncloses the said wider portion c^3, when a large volume of air is instantly allowed to pass through, and the full speed of the motor is at once attained.

E designates an arc-shaped chronometric scale.

F is a pointer, which by its position on the scale indicates the speed at which the music-sheet is moving and which at the same time serves as a hand-lever for controlling and operating the valve by means of suitable connections and devices between said valve and said indicator-lever. A convenient means for connecting the said valve and indicator-lever, so as to secure a reliable movement of the valve and a quick response to the movements of the indicator-lever, is that shown in the accompanying drawings, where the indicator-lever F is the long arm of a bell-crank, the short arm f of which is connected to a rod f', which in turn is connected to the upper arm g of a rock-shaft G, whose lower arm g' is connected to and impels the said sliding throttle-valve c'.

To allow of fine adjustment of the valve to the movement of the indicator-lever, instead of the upper arm g of the rock-shaft being fixed firmly to the rock-shaft G it may be provided with a collar g^2, which will be fitted to the said rock-shaft, and provided with a set-screw, whereby it may be secured to the rock-shaft in different positions.

The operation of my improvement is substantially as follows: Suppose the music-sheet to have the numerals "50," "20," and "85" marked upon it and that the roller is placed in the instrument. The performer to start the piece at the proper tempo moves the indicator along the scale until it reaches "50" on the scale. As the indicator is also a lever

for operating the valve, this causes the valve c' (shown in the drawings) to move along and uncover part of opening c^2, as shown in Fig. 3. The motor is now left to run at this moderate rate of speed until the next numeral "20" appears, when the performer moves indicator back to "20" on the scale, thus lessening the rate of speed of motor, and consequently reducing the tempo. Again, when the numeral "85" appears on the sheet the performer moves the indicator along the scale, and the speed of the motor increases steadily until about "80" is reached, when, owing to the peculiar shape of the opening c^2, the wider portion c^3 of said opening, Fig. 3, is suddenly uncovered and a full speed of motor is attained. Thus by moving the indicator slowly along from zero up the scale I secure a gradual but steady quickening of the tempo until about "80" is reached, when the wider portion is uncovered and the full speed of the motor is instantly attained.

What I claim as new is—

1. In a musical instrument wherein the sound-producing devices are controlled by a traveling music-sheet or like device, a pneumatic motor for propelling such device, and means for controlling the supply of air to the said motor and for permitting a gradual increase in the volume of air to a certain point and suddenly increasing the volume of air at another point.

2. In a musical instrument wherein the sound-producing devices are controlled by a traveling music-sheet or like device, a pneumatic motor for propelling said device, a throttle-valve for said motor, a scale for indicating tempo and a bell-crank lever one of whose arms serves as a pointer for said scale, and as a handle and the other of whose arms serves to actuate the said valve.

3. In a musical instrument wherein the sound-producing devices are controlled by a traveling music-sheet or like device, a pneumatic motor for propelling said device, a throttle-valve for said motor, a scale for indicating tempo and a contrivance serving as a pointer for said scale and as a direct controller of the throttle-valve, said valve being provided with an opening shaped so as to permit of a gradual increase in the volume of air to a certain point and to suddenly increase the volume of air at another point.

4. In a musical instrument wherein the sound-producing devices are controlled by a traveling music-sheet or like device, a pneumatic motor for propelling said device, a throttle-valve for said motor, a scale for indicating tempo and a contrivance serving as a pointer for said scale and as a direct controller of the throttle-valve, an adjustable connection being provided between said contrivance and said valve.

5. In a musical instrument wherein the sound-producing devices are controlled by a traveling music-sheet or like device, a pneumatic motor for propelling said device, a throttle-valve for said motor, an opening c^2 over which said valve slides, shaped so as to permit of a gradual increase in the volume of air to a certain point and to suddenly increase the volume of air at another point, and a device for controlling the said valve, substantially as described.

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

JOSEPH HERBERT CHASE.

Witnesses:
A. C. BUMPUS,
W. K. BRIGHAM.