H. E. TOWER.

MUSICAL INSTRUMENT AIR GOVERNOR CHECK.

APPLICATION FILED JULY 27, 1917.

1,253,110.

Patented Jan. 8, 1918.

2 SHEETS—SHEET 1.

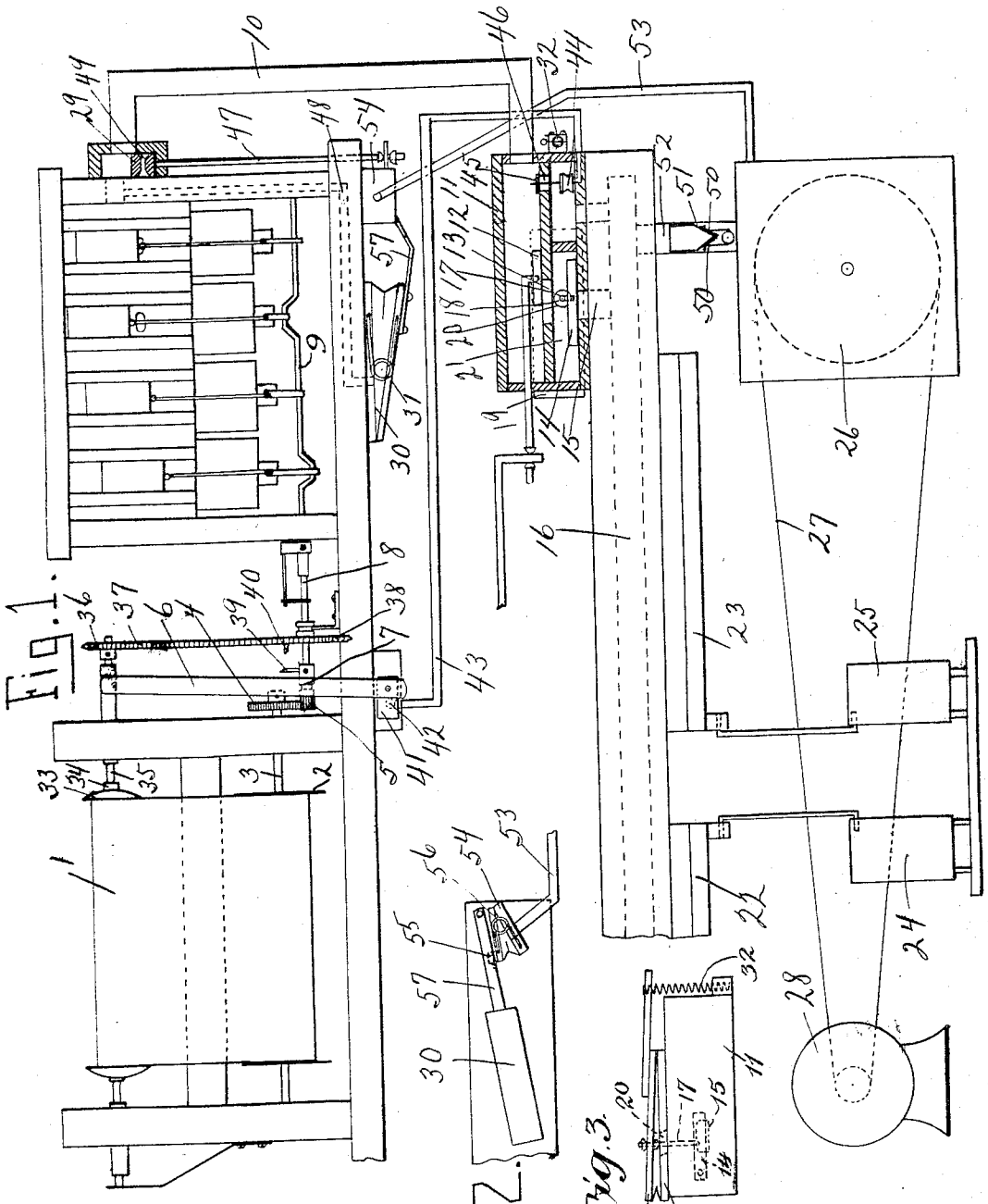

Fig. 1.

Fig. 2.

Fig. 3.

WITNESSES.

Robt. A. Gally.

Wm Stonhope.

INVENTOR

Herschel E. Tower.

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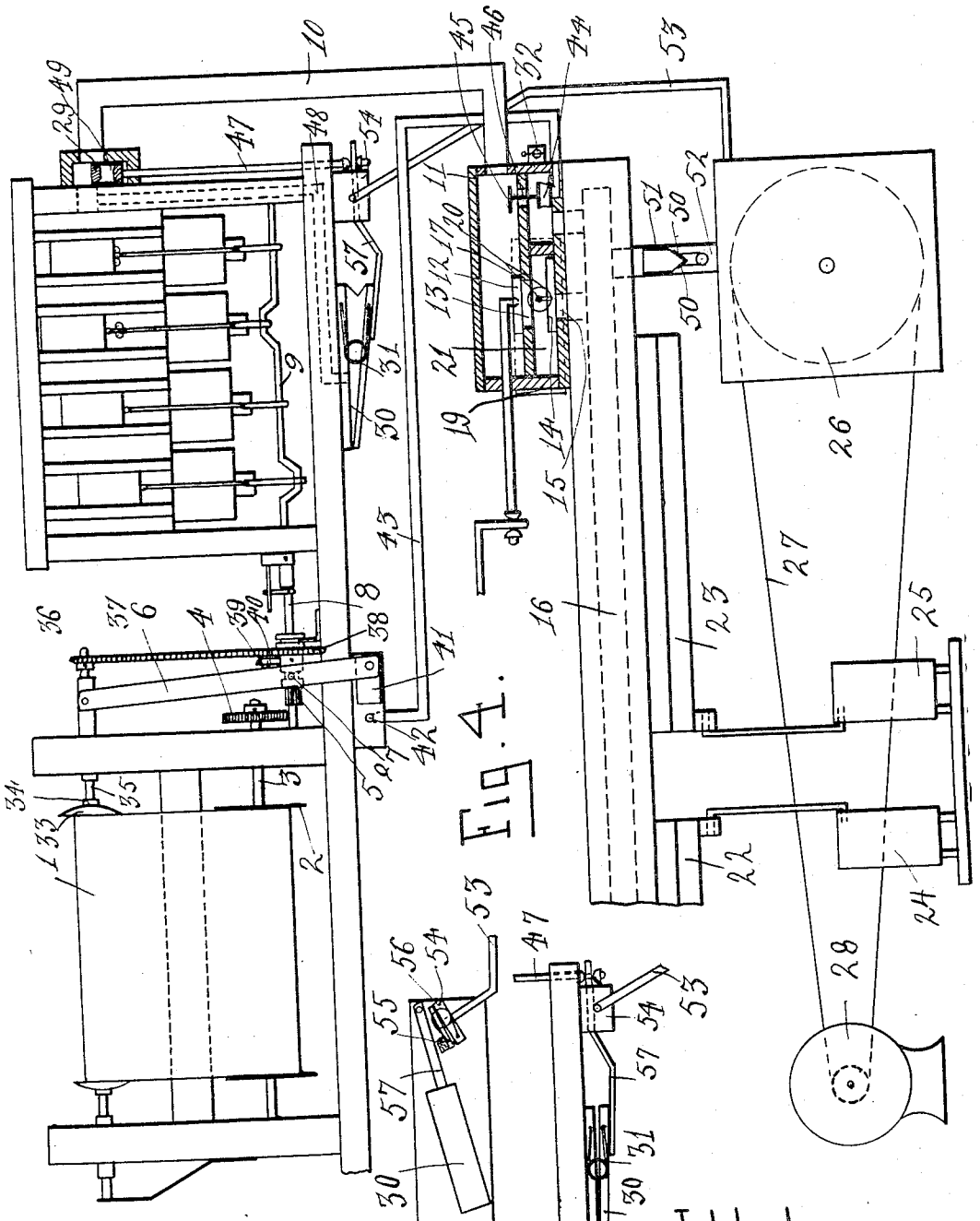

Fig. 4.

Fig. 5.

Fig. 6.

WITNESSES

Robt. A. Gally.

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INVENTOR

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UNITED STATES PATENT OFFICE.

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MUSICAL-INSTRUMENT AIR-GOVERNOR CHECK.

1,253,110. Specification of Letters Patent. Patented Jan. 8, 1918.

Application filed July 27, 1917. Serial No. 183,164.

To all whom it may concern:

Be it known that I, HERSCHEL E. TOWER, a citizen of the United States, and residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Musical-Instrument Air-Governor Checks, of which the following is a specification.

In a recent improvement for the wind motors of the winding and rewinding apparatus of automatic music players, for which a patent application has been filed by Robert A. Gally, application #182164, a special governor or air check is provided to govern and limit the speed of the rewinding operation. When such a rewinding governor is used in an auto-pneumatic music player having both foot pumping means and power driven pumping means for inducing the wind or suction required to operate the said wind motor, a proper regulating of the said rewind governor to sufficiently check or reduce the air supply to the motor for the proper rewinding the music sheet will be such as to give an undesirably slow rewinding when pumping the air by the foot pumpers, the foot pumping usually producing less air service and of lower tension than the power pumping, wherefore the present invention adds an improvement to any governor to a wind motor operating a rewinding apparatus, such improvement consisting of an intermittent pneumatic check adapted to lessen or prevent the restricting action of said rewind governing only when the foot pumpers are operated.

In the drawings Figure 1 is a front view of the music sheet and its spool gearing and motor, etc., in condition for playing with the rewind governor and improved check thereto, the tempo governor, and both foot and power pumpers for inducing the air service; Fig. 2 is a plan view of the rewind governor and its check viewed from the under side of Fig. 1, Fig. 3 is a plan view of the tempo governor; Fig. 4 a front view similar to Fig. 1 but with the parts in position for foot power rewinding; Fig. 5 is the rewind governor viewed from beneath it, and Fig. 6 is a front view of the same governor; both views Figs. 5 and 6 being when this governor is acting for the rewinding operation during the power pumping.

A description will first be given of the music sheet winding and rewinding parts, foot and power pumpers, etc., and the rewinding governor of the prior invention, to which the present invention is applied, and then the particular parts of the invention of this application will be detailed and claimed.

A music sheet 1 has a take-up spool 2 to wind said music sheet when playing music thereby, said spool 2 having a shaft 3 to which is fixed a gear 4 driven by a pinion 5 during such winding and playing, as shown in Fig. 1, at which times said pinion 5 is held to its position with said gear 4 by means of a shift lever 6 engaging a grooved collar 7, both pinion 5 and collar 6 being fast to the drive shaft 8 which is revolved by a wind motor 9 of any well known type.

At such position of the gearing for winding and playing, as in Fig. 1, the air service of the motor 9 is supplied through a pipe 10 connecting the wind motor 9 to a tempo controlling box 11 which is provided with a tempo valve 12 which is moved to more or less open the tempo slot or port 13. This tempo port 13 is supplied with air through a tempo air tension governor comprising a governor valve 14 movable over a governor port 15 leading to the main air supply chest 16, said governor valve having a connection 17 to the moving board 18 of the usual governor pneumatic 19, the interior of said pneumatic having air connection through an opening 20 from the governed air tension chamber 21, from which governed air tension chamber 21 the tempo port 13 leads past the tempo valve 12 to serve the motor 9 through the pipe 10 at such speed of the motor as may be set by the degree of opening of port 13 according to the particular position of the tempo valve 12.

The main air supply chest 16 has air suction created by any usual pumpers as 22, 23, actuated by foot pedals as 24, 25, or by any power driven wind inducing apparatus as the pumper 26 driven through a belt 27 from an electric or other power motor as 28.

Between the wind motor 9 and its service pipe 10 is placed a rewind governing valve 29 which is adapted to be slid to a position away from interference with the air travel from motor 9 to pipe 10 when the motor 9 is to be operated for winding the music sheet 1 for playing, the tempo governor valve 14 and its related parts then acting to

govern the air tension for a steady tempo control, the rewind governor valve 29 having no effect on the air service to the motor 9 because the rewind governor pneumatic 30 is opposed by a spring 31 set to a resistance requiring greater air tension to operate it than is determined by the tempo governor valve 14 and its governor pneumatic 19, whose moving board 18 is opposed by a spring 32 set to a resistance requiring less air tension to operate it than the air tension required to operate rewind governor pneumatic 30 as opposed by its spring 31.

The air service of the wind inducing apparatus through chest 16, may be of the usual varying tension common in auto-pneumatic players to secure varying power of expression, or may be of one steady degree of air tension, provided such air service is of sufficient tension at all times of winding the music sheet for playing, the tempo governor spring 32 being set to a proper degree of resistance to respond to and secure correct governing of air supply to the wind motor at all such times, and that such air service shall be of a sufficient degree of tension as to provide adequate increased power required to operate the wind motor for the rewinding operation of the music sheet.

For rewinding the music sheet 1, one end of the roll 33 with which such sheet is usually provided, has engagement with a clutch 34 on a revoluble spindle 35 having a sprocket wheel 36 on said spindle 35. A chain 37 connects this upper sprocket wheel 36 with a lower sprocket wheel 38 loosely mounted on drive shaft 8. When rewinding of the sheet 1 is desired the shift lever 6 is moved to the right engaging a clutch 39 on collar 7 with a clutch 40 on lower sprocket wheel 38 to enable the revolution of said sprocket wheel 38 by drive shaft 8 from operation of the wind motor shaft 9, the collar 7 being engaged with the drive shaft 8 and slidably movable with said shaft to enable the clutch 39 to be moved in and out of engagement with clutch 40 as just described, and when collar 7 and clutch 39 are at the position to the right for rewinding, the pinion 5 is clear from gear 4 thus permitting the free reverse revolution of take-up spool 2 as the sheet 1 is drawn off from it by the rewinding of said sheet 1 on to its roll 33 by means of the rewinding revolution of the spindle 35 and its clutch 34 which engages and revolves said roll 33.

When the gearing is set for the rewinding operation of the music sheet 1, the valve 41 has been moved to the right of and uncovered a port 42 which port is connected by a duct or tube 43 to a pneumatic 44 which is connected to a valve 45 over a rewind port 46, and the opening of the port 42 has caused the pneumatic 44 to raise its valve 45 and open its port 46, thus allowing the direct service of air from the mai air inducing chest 16 through the pipe 1 to the motor 9. In lieu of this pneumati control of the port 46, mechanical connec tions may be employed from the shift leve 6 to the valve 45 in any well known manne

The port 46 when open as described act as a by-pass to the tempo governor valv 14 and its port 15, the tempo governor de vice being thereby rendered ineffective a to any control or reduction of the air serv ice to the wind motor during the rewinding operation of the roll gearing and the music sheet 1 and its roll 33.

With this rewinding position and operation of the gearing, ineffective condition of the tempo governor, and open condition of the direct air service through rewind port 46, the rewind governor pneumatic 30 is collapsed against its spring 31 by the higher tension from the said direct air service through said rewind port 46 and pipe 10, with said air reduced and governed by the rewind governor valve 29 which is then moved by a connection or rod as 47 connecting the pneumatic 30 to the valve 29, the rewind governor valve 29 being thereby moved to a position partly interfering with the air service of pipe 10 to the motor 9, thus reducing the speed of the motor 9 to such rate as is desirable for quiet and safe rewinding and stopping of the music sheet 1 and its roll 33, except when the rewind governing is modified or nullified by the special check of the present invention as hereinafter described. The air connection 48 from the interior of the rewind governor pneumatic 30 to the air service of the motor 9, is to such air service at some part thereof which is at the motor side of said rewind governor valve 29. A vent or relief port 49 may be applied to the rewind governor valve 29 or thereabout, or various other substitutions or modifications made to the governor for the rewinding operation of the motor, but such are not necessary to be discussed herein, as the present invention is applicable to any manner of governor combined with a music sheet winding and rewinding motor and adapted to govern the rewinding of the sheet.

Check valves are provided as 50 acting on seats 51 having suitable ports, so that when the power pumper 26 is acting these check valves will be drawn open to allow suction of air through pipe 52 from air chest 16 and the other air chambers of the apparatus, whereas the operation of the pumpers 22 and 23 by their foot pedals 24 and 25 will produce air suction in air chamber 16, etc., but will draw check valves 50 to their seats 51 and thereby prevent drawing of air from the power pumper 26. Such pumper checks are not a part of my

invention, being an invention of the said R. A. Gally, but only shown to illustrate its use.

A tube 53 is connected from the power pumper 26 to the check pneumatic 54 for collapsing the pneumatic 54 when the power pumper 26 is operated, and which check pneumatic 54 has a check block 55 attached to the moving member of said check pneumatic 54, in such position that when the foot pedals 24 and 25 and pumpers 22 and 23 are operated and there is no suction in the power pumper 26, the said check pneumatic 54 will be expanded by its spring 56 so that the check block 55 is brought into position opposite the extension 57 of the rewind governor pneumatic 30, as in Fig. 2, to partially or wholly check the collapse of the said rewind governor pneumatic 30 during rewinding operation of the wind motor 9, thereby securing a lesser degree or no governing or checking of the motor for rewinding operation.

Whenever the power pumper 26 is in operation, the suction therein acts through the tube 53 to collapse the check pneumatic 54 and thus move the check block 55 away from interference with the movement of the extension 57 of the rewinding governor pneumatic 30, thereby allowing said governor pneumatic 30 to have a greater collapse during the rewinding operation of wind motor 9 to govern or check the air supply of said motor, and secure a desirable speed of rewinding of the music sheet 1.

Various adaptations may be made of this invention, either with music sheet motors, or winding and rewinding apparatus, or for any other air governing in musical instruments, and yet be, what I claim as my invention, which is:—

1. A music sheet winding and rewinding apparatus; a wind motor and driving connections therefrom to the said winding and rewinding apparatus; wind inducing means and power means connected to the same; wind inducing means and foot pedals connected to the same; air connections from both said wind inducing means to the said wind motor and an air governing means interposed in said air connections between said wind inducing means and said wind motor, said governing means adapted to operate only during the said rewinding operation of said wind motor, and a check means in combination with said governing means and adapted to limit the operative movement of said rewinding governing means only during the operation of said foot pumping means.

2. A music sheet winding and rewinding apparatus; a wind motor and driving connections therefrom to the said winding and rewinding apparatus; wind inducing means and power means connected to the same; wind inducing means; and foot pedals connected to the same; air connections from both said wind inducing means to the said wind motor and an air governing means interposed in said air connections between said wind inducing means and said wind motor, said governing means adapted to operate only during the said rewinding operation of said wind motor, and a check means in combination with said governing means and adapted to limit the operative movement of said rewinding governing means, and a connection from said power pumping means to said check means adapted to prevent the said check means from limiting the operation of the said governing means.

3. A music sheet winding and rewinding apparatus; a wind motor and driving connections therefrom to the said winding and rewinding apparatus; wind inducing means and power means connected to the same; wind inducing means and foot pedals connected to the same; air connections from both said wind inducing means to the said wind motor and an air governing means interposed in said air connections between said wind inducing means and said wind motor, said governing means adapted to operate only during the said rewinding operation of said wind motor, and a pneumatic check means in combination with said governing means and adapted to limit the operative movement of said rewinding governing means, and an air connection from said power pumping means to said check means adapted to prevent the said check means from limiting the operation of the said governing means.

4. A music sheet winding and rewinding apparatus; a wind motor and driving connections therefrom to the said winding and rewinding apparatus; wind inducing means and power means connected to the same; wind inducing means and foot pedals connected to the same; air connections from both said wind inducing means to the said wind motor and an air governing means interposed in said air connections between said wind inducing means and said wind motor, said governing means adapted to operate only during the said rewinding operation of said wind motor, and means adapted to limit the action of said governor only during the operation of said foot pumping means.

5. A music sheet winding and rewinding apparatus; a wind motor and driving connections therefrom to the said winding and rewinding apparatus; wind inducing means and power means connected to the same; wind inducing means and foot pedals connected to the same; air connections from both said wind inducing means to the said wind motor and an air governing means interposed in said air connections between said wind inducing means and said wind motor,

said governing means adapted to operate only during the said rewinding operation of said wind motor, and means connected to one of said pumper means and adapted to control the said air governing means to a different degree of air governing during the operation of one of said pumping means than during the operation of the other said pumping means.

6. A musical playing apparatus having two alternative air service inducing means operated by two respective sources of power, an air governing means connected to both said air service means and means controlled by the said two alternate air service inducing means and adapted to change the degree of air control of said governing means according to which of the said air inducing means is in operation.

7. A musical apparatus having two alternative air service inducing means; an air governing means connected to said air service; and means controlled by said air service and adapted to change the degree of air control of said governing means according to which of said air inducing means is in operation.

8. A music playing apparatus having two alternative air service inducing means operated by two separate sources of power; an air governing means connected to said air service; a wind motor connected to the said governor; and means controlled by said air service and adapted to change the degree of air control of said governing means according to which of said air inducing means is in operation.

HERSCHEL E. TOWER.

Witnesses:
PAUL HENGGE,
NORMA KEISER.