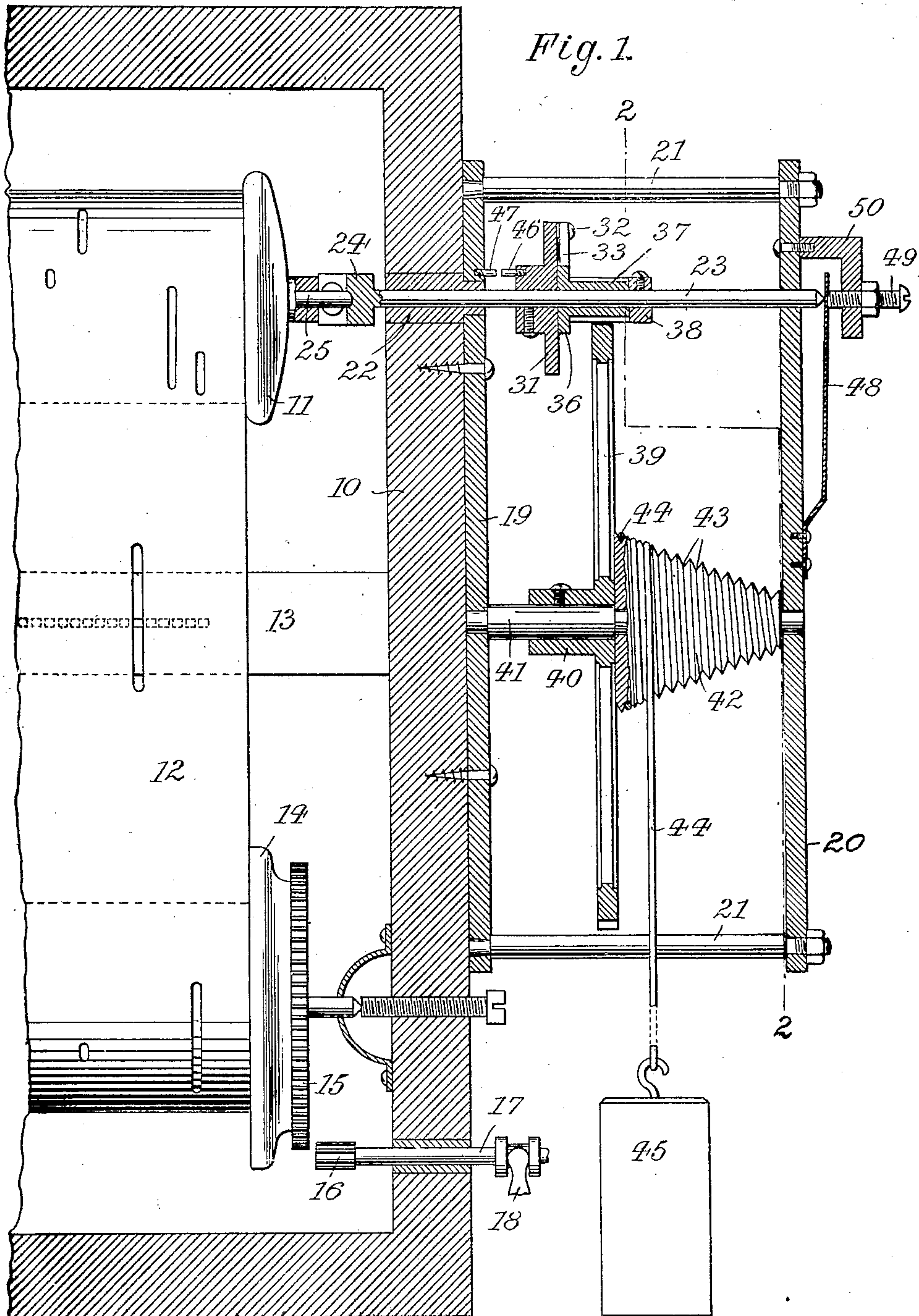


J. SKUBIS.
 COMBINED BRAKE AND REWINDER FOR AUTOMATIC MUSICAL INSTRUMENTS.
 APPLICATION FILED MAR. 29, 1909.

925,665.

Patented June 22, 1909.

2 SHEETS—SHEET 1.



Witnesses:
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Edward Schorr

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 By his Attorney
Frank J. Friesen

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Fig. 2.

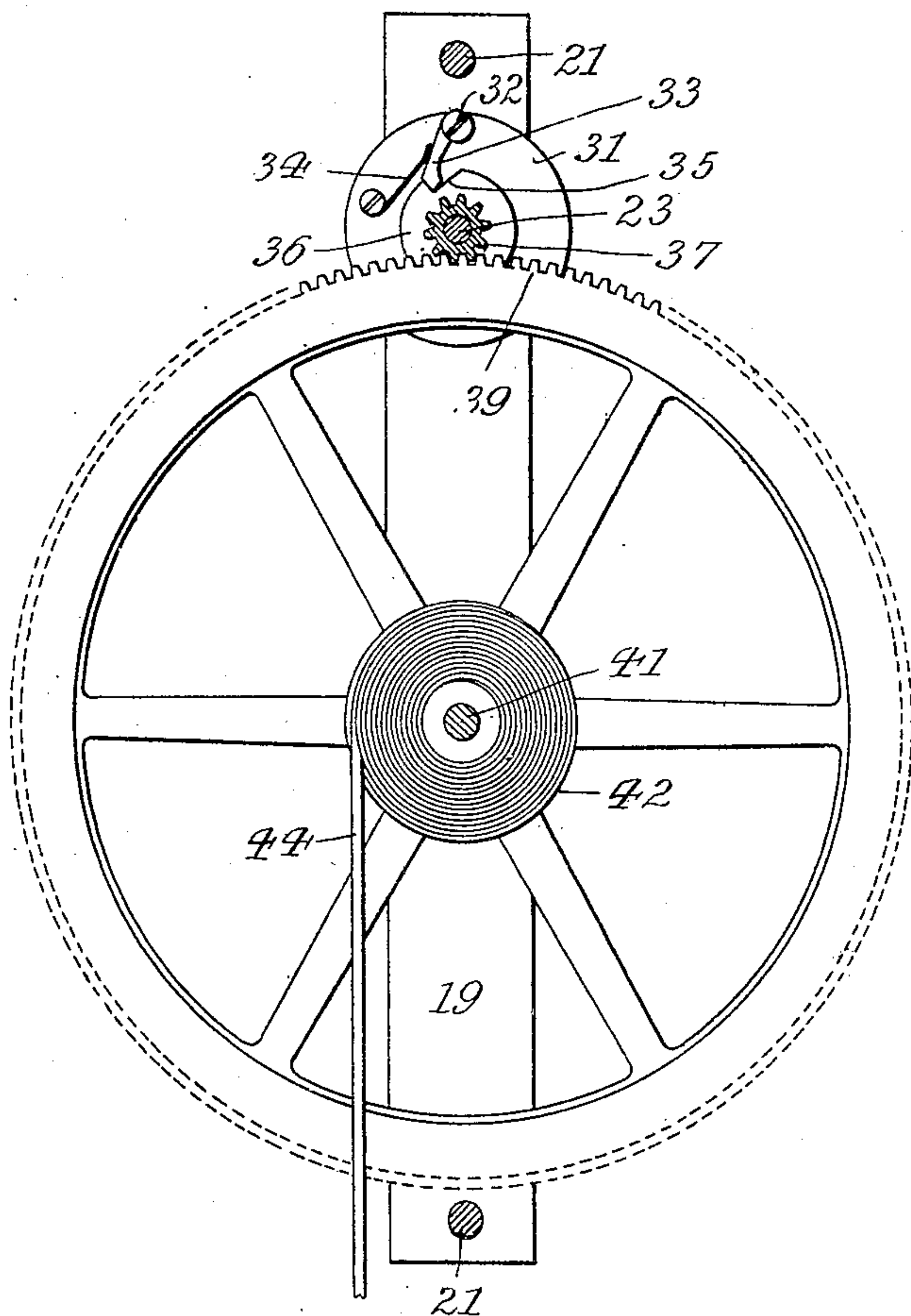


Fig. 3.

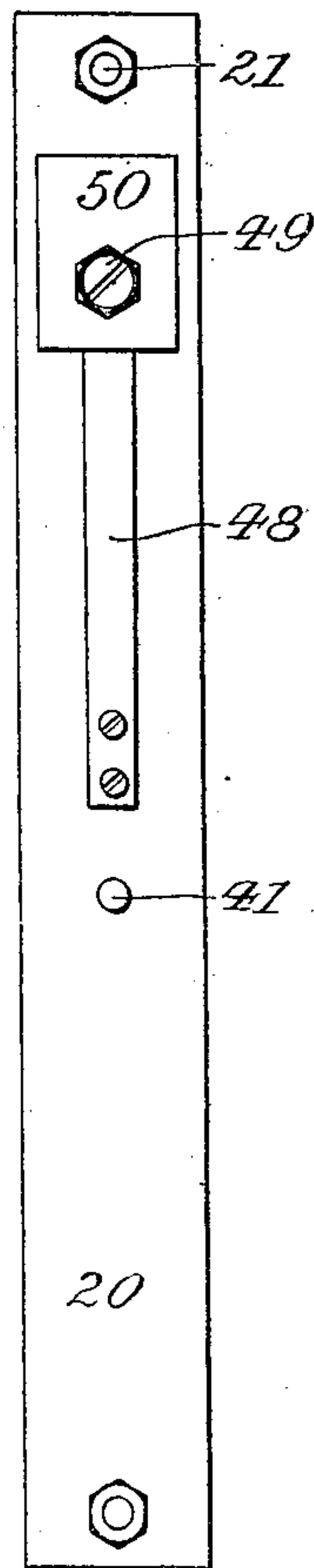
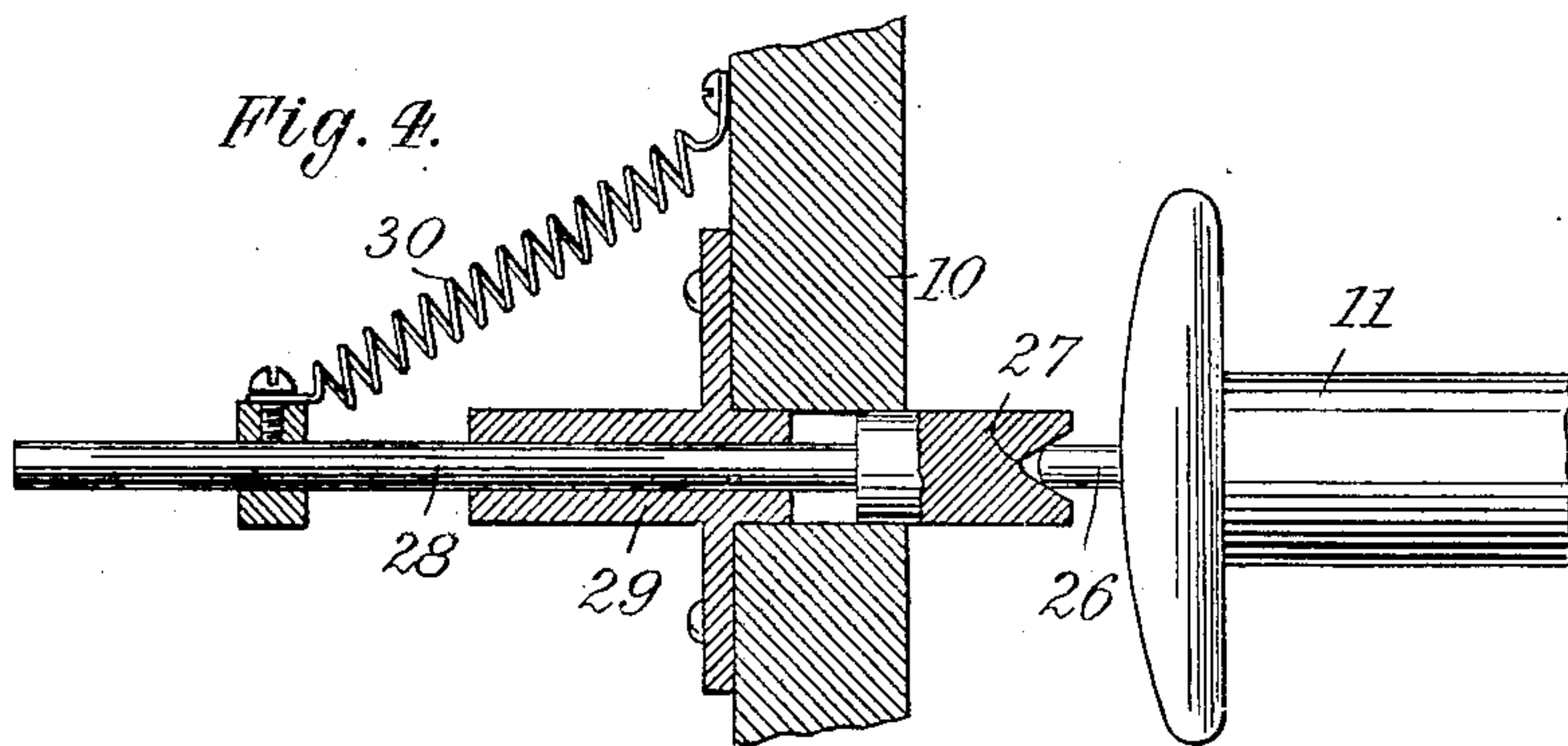


Fig. 4.



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UNITED STATES PATENT OFFICE.

JACOB SKUBIS, OF NEW YORK, N. Y.

COMBINED BRAKE AND REWINDER FOR AUTOMATIC MUSICAL INSTRUMENTS.

No. 925,665.

Specification of Letters Patent.

Patented June 22, 1909.

Application filed March 29, 1909. Serial No. 486,483.

To all whom it may concern:

Be it known that I, JACOB SKUBIS, a citizen of Germany, residing at New York city, Bronx, county and State of New York, have invented new and useful Improvements in Combined Brakes and Rewinders for Automatic Musical Instruments, of which the following is a specification.

This invention relates to a device for rewinding the perforated music sheet after a piece of music has been played and is more particularly adapted to be used with foot-actuated pneumatic pianos or piano players.

The rewinding means comprise, essentially, a weight which is raised during the playing of the instrument and is permitted to descend for automatically rewinding the music sheet, so that the operator need no longer operate the usual treadles for this purpose. The connections between weight and music roll are such that during playing the former constitutes a brake for the latter, the braking force being gradually reduced according to the decrease of the diameter of the unwound music roll. With the brakes having a constant braking force, as now generally used, the retarding effect is more easily overcome at the beginning of the playing than at the end thereof, owing to the gradual decrease of diameter of the music roll and the corresponding decrease of the leverage with which the music sheet has to overcome said braking force. Consequently, as the resistance of the music sheet is comparatively small at the start, said sheet will be first wound loosely around the take-up roll, while with the decrease of the diameter of the music roll, said resistance will gradually increase. The result is that the retarding effect of the brake will eventually become so great that the music roll comes to a temporary stop, while the take-up roll continues in its rotation to tighten up its loose windings. This objectionable slipping of the music sheet around the take-up roll causes the music sheet to dwell for an undue length of time in operative engagement with the tracker bar so as to effect an improper lengthening of the notes. By my invention this objection is entirely overcome and the music sheet is caused to be fed over the tracker bar for its entire length under uniform conditions.

In the accompanying drawings: Figure 1 is a vertical section, partly in view, of my improved combined brake and re-winder.

Fig. 2 a section on line 2—2, Fig. 1; Fig. 3 a side view of the frame carrying the braking and rewinding device, and Fig. 4 a detail of the left hand end of the music-roll and its bearing.

Within a box or casing 10, built into a piano or piano-player, is removably journaled the music roll or spool 11 from which the perforated music sheet 12 is drawn over duct-bridge 13 to the take-up roll 14 which is also journaled in box 10. For playing the instrument, roll 14 is provided with a gear wheel 15 adapted to be engaged by a pinion 16 fast on an axially movable driving-shaft 17 connected to the usual air motor, (not shown). During the rerolling operation, shaft 17 is moved outward by means of the usual shipping lever 18, to throw wheels 15, 16 out of gear. While a piece of music is being played, the diameter of roll 11 gradually decreases, while that of roll 14 proportionately increases. With the constructions hitherto employed, a constant braking power was applied to roller 11, so that the pull of sheet 12 gradually increased with the decrease of the diameter of roll 11 to overcome the braking force. In other words, the music sheet was apt to wind loosely upon roll 14 during the beginning of the playing and to tighten more and more thereon toward the end of the piece, owing to the gradual decrease of the leverage of the music sheet on roll 11. The increased pull on the sheet wound on roll 14 would result in an undesirable jerking or slipping of the sheet windings on said roller. By my improved construction, the above objection is overcome because the tension or force of the brake is made to decrease at a ratio proportionate, substantially, to the decrease of the diameter of roll 11. This desirable result is accomplished as follows: To one side of box 10 is attached a frame consisting of a pair of upright plates 19, 20, and connecting bolts 21. In plate 20 and a bushing 22, is journaled a rotatable and axially movable shaft or spindle 23 carrying at its inner end a coupling 24 for one of the pins 25 of roll 11. The other pin 26 of this roll engages a socket 27 formed on the end of a plunger 28 that passes through a bushing 29 of box 10 and is normally pressed inward by a strong spring 30, (Fig. 4). Fast on spindle 23 is a disk 31, to which is pivoted at 32 a pawl 33 influenced by a spring 34. This pawl is adapted to engage a peripheral notch 35 of a flange

36 integral with a long pinion 37 rotatable on spindle 23. Pinion 37 is held against axial displacement by means of a collar 38 clamped to spindle 23. The pinion is permanently engaged, either directly or indirectly, by a toothed wheel 39, the hub 40 of which is fast on a shaft 41 journaled in plates 19, 20. Upon this shaft is mounted a cone pulley 42 having a peripheral spiral groove 43, the convolutes of which, of course, decrease in diameter from the base toward the apex of the pulley. Groove 43 is engaged by a rope 44 secured at one end to pulley 42 near the base thereof, while from its other or free end is suspended a weight 45. While a piece of music is being played, the rotation of roll 11 will, by coupling 24, spindle 23, disk 31, pawl 33, notched flange 36, pinion 37, gear wheel 39 and shaft 41, be transmitted to cone pulley 42. Thus as the sheet 12 is gradually drawn from roll 11 upon roll 14, weighted rope 44 will be wound upon cone pulley 42 from its base toward the apex of the latter. During this operation, the resistance offered by weight 45 will constitute a brake for the music roll. As the sheet unwinds, the rope will gradually travel from the base toward the apex of pulley 42, so that the leverage of the weighted rope 44, on pulley 42, decreases corresponding, substantially, to the decrease of the sheet-windings on roll 11. In this way the desired uniformity in the tension of the music sheet is obtained. After the piece of music has been played, shaft 17 is uncoupled from wheel 15 by means of the shipping lever 18. The weight 45 being thus liberated, will now descend to rotate pulley 42 in the reverse direction and thus, by the transmission previously described, rotate roll 11, to re-wind music sheet 12.

It occasionally happens that the music sheet runs untrue while passing over the tracker bar, and requires a manual adjustment on its roll, for which purpose the latter must be removed from casing 10 before the entire sheet is unrolled. But when roll 11 is uncoupled from shaft 23, weight 45 would be free to descend and thereby lose its proper place for braking and re-winding on the subsequent reintroduction of roll 11. Means are therefore provided for automatically locking shaft 23 upon the uncoupling therefrom of roller 11. These means consist of a pair of pins 46, 47 secured to disk 31 and

plate 19, respectively, and arranged at equal radial distances from the axis of spindle 23. The outer end of this spindle is engaged by a weak spring 48, the deflection of which is checked by an abutting screw 49 tapped into a bracket 50. When a music roll is inserted into box 10, spring 30 will overcome spring 48, to push spindle 23 outward and thus cause pin 46 to clear pin 47. When, however, the music roll is removed, spindle 23 is relieved from the influence of spring 30, so that spring 48 is at liberty to push the spindle inward and thus project pin 47 across the path of pin 46. In this way disk 31 will be arrested to lock spindle 23 and thus check the descent of the weight.

The pawl and ratchet mechanism 33, 36, permits the music roll 11 to rotate freely by momentum after tune sheet 12 has been unhooked from roller 14, and rope 44 has been entirely unwound from cone pulley 42.

I claim:

1. A device of the character described, comprising a music roll, a music sheet, a take-up roll, a shaft adapted to be coupled to the music roll, a grooved cone pulley operatively connected to said shaft, and a weighted rope engaging said pulley, said rope being connected to the pulley in proximity to the base thereof.

2. A device of the character described, comprising a music roll, a music sheet, a take-up roll, a shaft adapted to be coupled to the music roll, a pawl rotatable with the shaft, a loose pinion mounted on the shaft and engaged by the pawl, a grooved cone pulley intergeared with the pinion, and a weighted rope engaging the pulley.

3. A device of the character described, comprising a music roll, a music sheet, a take-up roll, an axially slidable spring-influenced shaft adapted to be coupled to the music roll, a disk carried by the shaft, means for arresting said disk upon the uncoupling of the music roll, a pawl carried by the disk, a loose pinion mounted on the shaft and engaged by the pawl, a grooved cone pulley intergeared with the pinion, and a weighted rope engaging the pulley.

Signed by me at New York city, (Manhattan,) N. Y., this 27th day of March, 1909.

JACOB SKUBIS.

Witnesses:

W. R. SCHULZ,

FRANK V. BRIESEN.