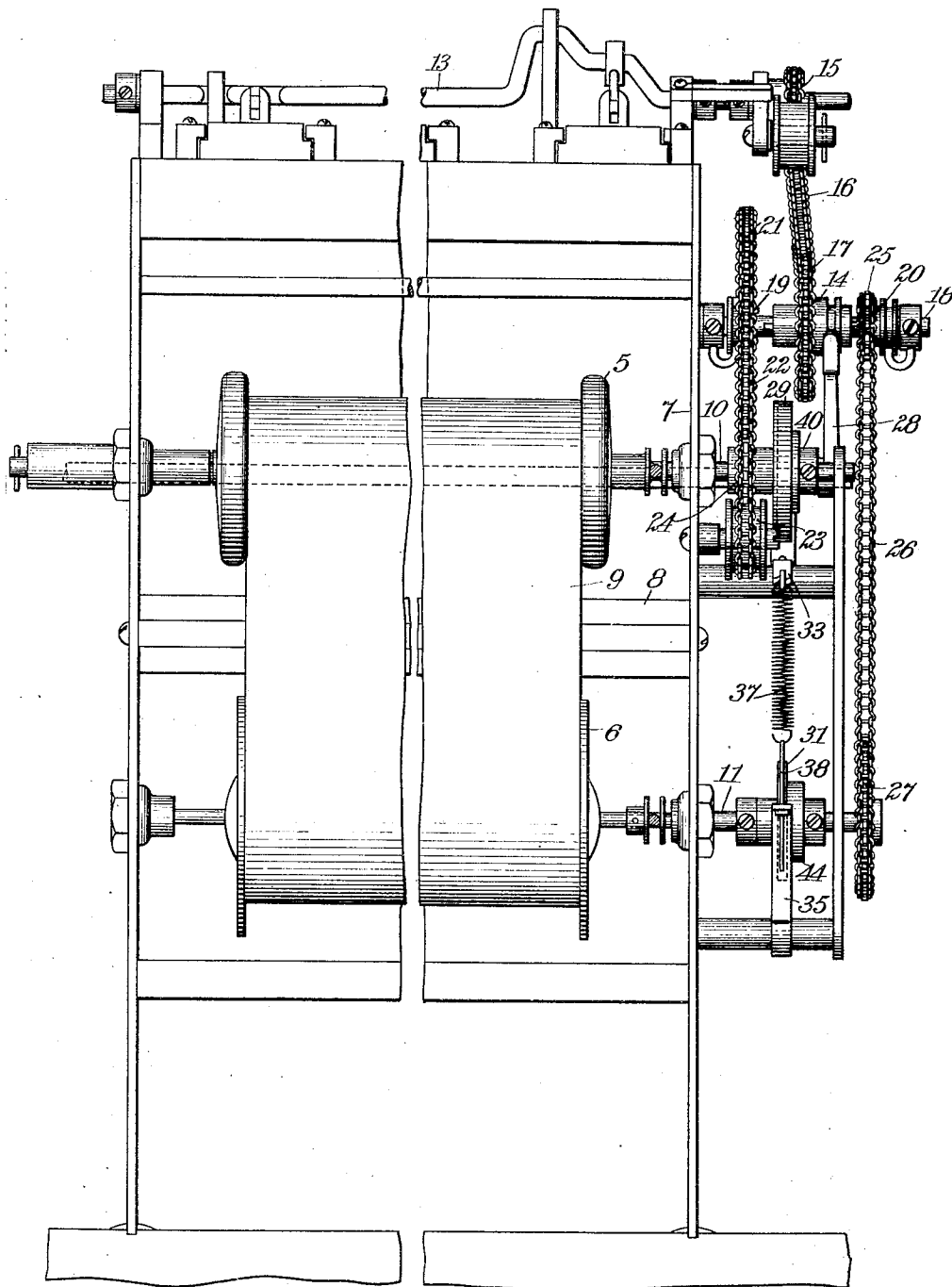


G. W. & R. PAULSON.  
MUSIC SHEET WINDING AND REWINDING MECHANISM.  
APPLICATION FILED MAR. 10, 1911.

1,000,549.

Patented Aug. 15, 1911.  
2 SHEETS—SHEET 1.



Witnesses:  
*Sydney E. Taft.*  
*Leonard A. Powell.*

Fig. 1.

Inventors:  
*Gustaf W. Paulson*  
*Rudolf Paulson*  
by their attorney *Charles S. Gooding.*

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2 SHEETS—SHEET 2.

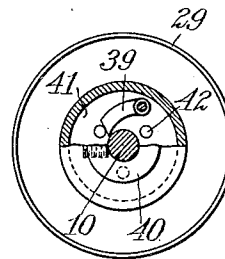
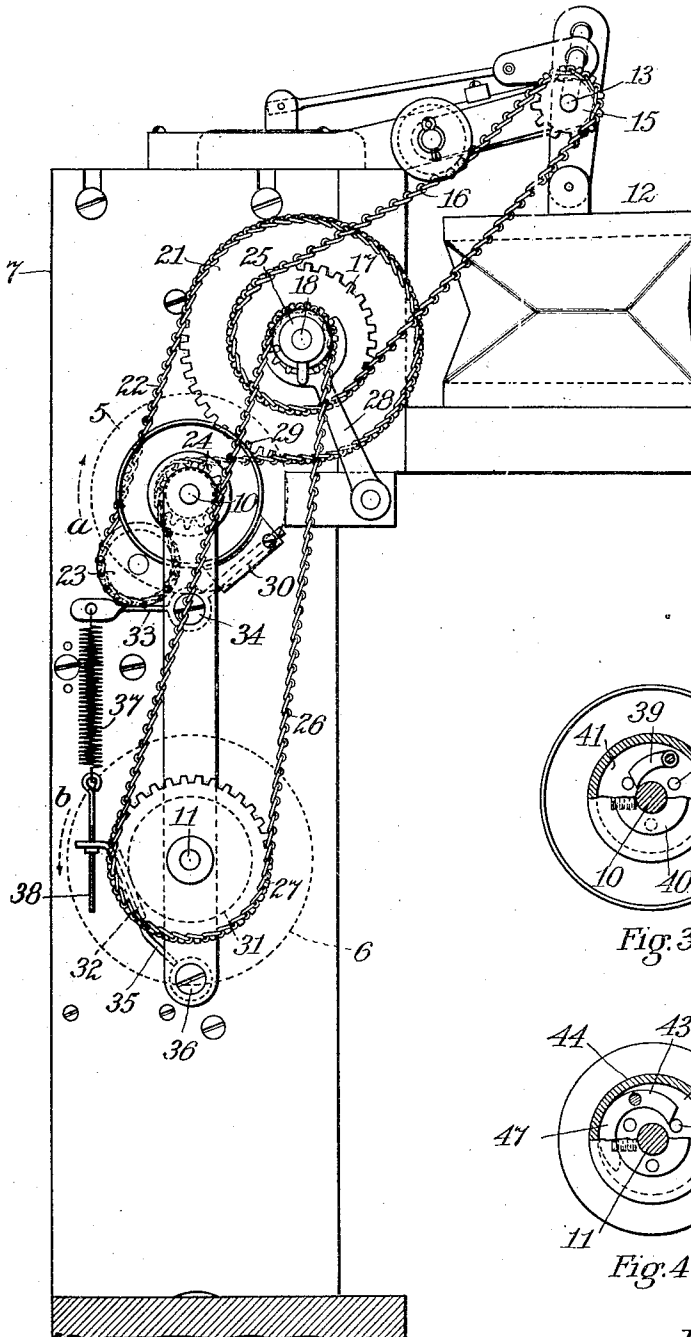


Fig. 3.

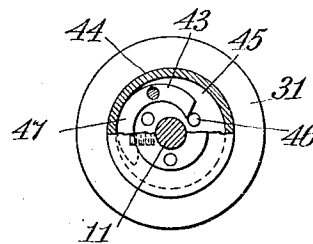


Fig. 4.

Witnesses:  
*Sydney E. Taft.*  
*Leonard A. Powell.*

Fig. 2.

Inventors:  
*Gustaf W. Paulson*  
*Rudolf Paulson*  
by their attorney *Charles N. Gooding*

# UNITED STATES PATENT OFFICE.

GUSTAF WM. PAULSON, OF BELMONT, AND RUDOLF PAULSON, OF BOSTON, MASSACHUSETTS, ASSIGNORS TO HENRY F. MILLER & SONS PIANO COMPANY, A CORPORATION, OF MASSACHUSETTS.

## MUSIC-SHEET WINDING AND REWINDING MECHANISM.

1,000,549.

Specification of Letters Patent. Patented Aug. 16, 1911.

Application filed March 10, 1911. Serial No. 613,613.

*To all whom it may concern:*

Be it known that we, GUSTAF W. PAULSON, a citizen of the United States, residing at Belmont, in the county of Middlesex, and  
5 RUDOLF PAULSON, a citizen of the United States, residing at Boston, in the county of Suffolk, both in the State of Massachusetts, have invented new and useful Improvements in Music-Sheet Winding and Rewinding Mechanism, of which the following is a specification.

This invention relates to improvements in music sheet winding and rewinding mechanisms used in connection with mechanically-  
15 operated musical instruments and has for its object to provide a mechanism of this class which shall be simple in construction, certain and reliable in its action, and in which the brakes for the tensioning of the music sheet as it passes from the music spool to the take-up roller and vice versa shall become effective by merely the reversal of the direction of movement of the music sheet without the aid of any extraneous devices such as  
25 pneumatics for setting and releasing the brakes such as are commonly employed.

To these ends, the invention consists in the novel features of construction and in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the claims.

Referring to the drawings: Figure 1 is a front elevation of a music sheet winding and rewinding mechanism embodying our invention, partly broken away. Fig. 2 is a side elevation of the mechanism viewed from the right hand side of Fig. 1. Fig. 3 is an enlarged detail side elevation, partly in section, of the brake for the music spool.  
40 Fig. 4 is an enlarged detail side elevation, partly in section, of the brake for the take-up roller.

Like numerals refer to like parts throughout the several views of the drawings.

45 In the drawings, 5 is music spool and 6 a take-up roller journaled in any usual or desired bearings in a frame 7 constituting also a support for a tracker 8 across which a music sheet 9 travels from the music spool to the take-up roller and vice versa. The music spool 5 is connected to be driven by a shaft 10 and the take-up roller 6 is connected to be driven by a shaft 11, both of these shafts being journaled in suitable bear-

ings in the frame 7 in any usual or desired 55 manner.

A motor 12, which may be of any usual or desired construction, has a driving shaft 13 which is connected by any suitable mechanism to the shafts 10 and 11 to drive either 60 of them at will in the proper direction to cause the movement of the music sheet 9 in one direction or the other, as desired. In the present instance, the shaft 13 is connected to drive a clutch member 14 by a sprocket wheel 15 secured to said shaft and connected by a chain 16 to a sprocket wheel 17 formed on or secured to the clutch member 14. The clutch member 14 is loosely mounted upon a stationary shaft 18 in such a manner as to 70 be capable of rotating and sliding longitudinally thereon.

The shiftable clutch member 14 may be thrown into engagement on one side with a clutch member 19 and on the other side with 75 a clutch member 20, the former being provided with a sprocket wheel 21 connected by a chain 22 passing around an idler 23 to a sprocket wheel 24 secured to the music spool shaft 10, while the clutch member 20 is provided with a sprocket wheel 25 connected by a chain 26 to a sprocket wheel 27 secured to the take-up roller shaft 11.

In the operation of the mechanism the clutch member 14 is constantly driven in one 85 direction by the motor 12 and is thrown into driving engagement with the clutch member 19 or the clutch member 20 by means of a suitable clutch shifter 28 so as to cause the motor to drive the music spool 5 in the direction of the arrow *a* or to cause the motor to drive the take-up roller in the direction of the arrow *b* according to the direction in which it is desired to have the music sheet travel. 95

The music spool 5 is provided with suitable braking means and the take-up roller 6 is also provided with suitable braking means, in the present instance such braking means consisting of a brake drum 29 loosely mounted upon the shaft 10 and having a brake shoe 30 bearing thereagainst and a brake drum 31 loosely mounted upon the shaft 11 and having a brake shoe 32 bearing thereagainst. The brake shoe 30 is preferably 105 mounted upon a lever 33 fulcrumed on a pivot 34 and the brake shoe 32 is preferably mounted on a lever 35 fulcrumed on a pivot

36. The brake shoes are held in engagement with their respective brake drums preferably by a spring 37 connecting the levers 33 and 35 to each other and provided with a screw-threaded adjusting rod 38 by means of which the tension of said spring may be regulated.

As distinguished from mechanisms of this class heretofore, the brake shoes 30 and 32 remain continuously in engagement with their respective brake drums 29 and 31, thus obviating the necessity of mechanism to move them alternately into and out of engagement with their respective drums upon the reversal of the direction of movement of the music sheet. This is accomplished by providing a suitable driving connection between the brake drum 29 and the shaft 10 permitting relative rotation of the spool 5 and the brake drum 29 in one direction, but locking said spool and said brake drum against relative rotation in the opposite direction and by providing suitable means connecting the brake drum 31 to the shaft 11 permitting relative rotation of the take-up roller 6 and the brake drum 31 in one direction, but locking said roller and said brake drum against relative rotation in the opposite direction. In other words, the means just referred to automatically connects the spool to drive its braking means when the spool is rotated in one direction, but disconnects the spool from its braking means when said spool is rotated in the opposite direction and similarly the roller is automatically connected to drive its braking means when said roller is rotated in one direction, but disconnected therefrom when said roller is rotated in the opposite direction. For this purpose, we preferably employ the devices which we will now proceed to describe and which form the main feature of our invention.

39 is a pawl pivotally mounted upon a collar 40 secured to the shaft 10 and provided with a recess 41 in which said pawl is located, said pawl being arranged to co-operate with a ratchet consisting of a series of pins 42 projecting from the face of the brake drum 29 into said recess, as clearly shown in Fig. 3. This pawl is preferably gravity-operated or, in other words, it engages with its ratchet to drive the same when the pawl is above the shaft 10 and when once engaged with one of the pins 42 of the ratchet its point is held against accidental disengagement from the pin by the fact that the end of the pawl is beveled, as shown, so that when in driving engagement and located below the shaft it will be understood that it will remain engaged as long as the power is applied to rotate the collar 40 upon which the pawl is mounted. As stated, the pawl is preferably gravity-operated in order that when the reversal of direction

of motion of the music sheet takes place a short period of time shall elapse before the brake drum 29 starts to rotate.

A pawl 43 is pivoted on a collar 44 secured to the shaft 11 and located in a recess 45 provided in said collar and into this recess a series of pins 46 project, said pins constituting a ratchet with which said pawl coöperates so that when the take-up roll 6 is rotated in one direction, the brake drum 31 will be locked thereto and travel in unison therewith, but upon a reversal of movement of the music sheet the pawl will simply travel idly over its ratchet and the brake drum 31 will remain stationary. Preferably, the pawl 43 is provided with a long weighted arm 47 constituting a means actuated by centrifugal force to throw said pawl into engagement with its ratchet as soon as the take-up roller has started to rotate in the proper direction. Except for this difference in the operation of the pawls, the braking means for the music spool and the take-up roller operate in substantially the same manner.

It will be understood from the foregoing that the braking means for the music spool 5 and the braking means for the take-up roller 6 become effective only upon the rotation of their respective brake drums through the medium of their pawls and ratchets and accordingly the tensioning of the music sheet is accomplished without the use of any pneumatics or other devices for throwing the brake shoes into and out of contact with their respective brake drums, as has heretofore been the case.

While it is desirable to provide braking means for the take-up roller 6, it is not essential, and in many cases it is possible to dispense entirely with the braking means for the take-up roller and to equip only the music spool with a braking means operating as hereinbefore described. The reason for this is that when the instrument is being played the music leads off of the music spool and, of course, needs to be properly tensioned, whereas in rerolling the music sheet it is not essential that the sheet shall be tensioned.

Having thus described our invention, what we claim and desire by Letters Patent to secure is:

1. A music sheet winding and rewinding mechanism having, in combination, a music spool, a take-up roller, mechanism for driving either said spool or said roller, braking means for said spool, braking means for said roller, means to automatically connect said spool to drive its said braking means when said spool is rotated by the music sheet in being wound off of said spool onto said roller, but disconnect said spool from its braking means when said spool is rotated by said mechanism to wind the music sheet

off of said roller onto said spool, and means to automatically connect said roller to drive its said braking means when said roller is rotated by the music sheet in being wound off of said roller onto said spool, but disconnect said roller from its braking means when said roller is rotated by said mechanism to wind the music sheet off of said spool onto said roller.

2. A music sheet winding and rewinding mechanism having, in combination, a music spool, a take-up roller, mechanism for driving either said spool or said roller, braking means for said spool including a drum and a frictional device constantly acting thereon, braking means for said roller including a drum and a frictional device constantly acting thereon, means to automatically connect said spool to rotate its said drum when said spool is rotated in one direction, but disconnect said spool from its drum when said spool is rotated in the opposite direction, and means to automatically connect said roller to its said drum when said roller is rotated in one direction, but disconnect said roller from its drum when said roller is rotated in the opposite direction.

3. A music sheet winding and rewinding mechanism having, in combination, a music spool, a take-up roller, mechanism for driving either said spool or said roller, braking means for said spool including a rotatable member, braking means for said roller including a rotatable member, means connecting said spool to its said member permitting relative rotation of said spool and its member in one direction, but locking said spool and its member against relative rotation in the opposite direction, and means connecting said roller to its said member permitting relative rotation of said roller and its member in one direction, but locking said roller and its member against relative rotation in the opposite direction.

4. A music sheet winding and rewinding mechanism having, in combination, a music spool, a take-up roller, mechanism for driving either said spool or said roller, braking means for said spool including a drum and a frictional device constantly acting thereon, and means to automatically connect said spool to rotate said drum when said spool is rotated in one direction, but disconnect said spool from said drum when said spool is rotated in the opposite direction.

5. A music sheet winding and rewinding mechanism having, in combination, a music spool, a take-up roller, mechanism for driving either said spool or said roller, braking means for said spool including a rotatable member, braking means for said roller including a rotatable member, a gravity actuated pawl and cooperating ratchet connecting said spool to its said member, and a centrifugally actuated pawl and cooperating

ing ratchet connecting said roller to its said member, one of said ratchets with its cooperating pawl being reverse to the other.

6. A music sheet winding and rewinding mechanism having, in combination, a music spool, a take-up roller, mechanism for driving either said spool or said roller, braking means for said spool including a brake drum and a brake shoe acting thereon, braking means for said roller including a brake drum and brake shoe acting thereon, means yieldingly holding said brake-shoes in engagement with their respective brake-drums, a pawl and ratchet forming an operative connection between said spool and its said brake-drum, and a pawl and ratchet forming an operative connection between said roller and its said brake-drum, one of said ratchets with its cooperating pawl being reverse to the other.

7. A music sheet winding and rewinding mechanism having, in combination, a music spool, a take-up roller, mechanism for driving either said spool or said roller, braking means for said spool including a brake drum and a brake shoe acting thereon, braking means for said roller including a brake drum and brake shoe acting thereon, a spring connecting said brake-shoes to each other and urging them into engagement with their respective brake-drums, a pawl and ratchet forming an operative connection between said spool and its said brake-drum, and a pawl and ratchet forming an operative connection between said roller and its said brake-drum, one of said ratchets with its cooperating pawl being reverse to the other.

8. A music sheet winding and rewinding mechanism having, in combination, a music spool, a take-up roller, mechanism for driving either said spool or said roller, braking means for said spool, and means to automatically connect said spool to drive said braking means when said spool is rotated by the music sheet in being wound off of said spool onto said roller, but disconnect said spool from said braking means when said spool is rotated by said mechanism to wind the music sheet off of said roller onto said spool.

9. A music sheet winding and rewinding mechanism having, in combination, a music spool, a take-up roller, mechanism for driving either said spool or said roller, braking means for said spool including a drum and a frictional device constantly acting thereon, and means to automatically connect said spool to rotate said drum when said spool is rotated by the music sheet in being wound off of said spool onto said roller, but disconnect said spool from said drum when said spool is rotated by said mechanism to wind the music sheet off of said roller onto said spool.

10. A music sheet winding and rewinding mechanism having, in combination, a music spool, a take-up roller, mechanism for driving either said spool or said roller, braking  
5 means for said spool including a rotatable member, and means connecting said spool to said member permitting relative rotation of said spool and said member by the music sheet in being wound off of said spool onto  
10 said roller, but locking said spool and said member against relative rotation by said mechanism to wind the music sheet off of said roller onto said spool.
11. A music sheet winding and rewinding  
15 mechanism having, in combination, a music spool, a take-up roller, mechanism for driving either said spool or said roller, braking means for said spool including a rotatable member, and means consisting of a pawl and ratchet connecting said spool to said member to automatically connect said spool  
20 to drive said rotatable member when said spool is rotated by the music in being wound off of said spool onto said roller, but disconnect said spool from said rotatable  
25 member when said spool is rotated by said mechanism to wind the music sheet off of said roller onto said spool.

In testimony whereof we have hereunto set our hands in presence of two subscribing  
30 witnesses.

GUSTAF WM. PAULSON.  
RUDOLF PAULSON.

Witnesses:

LOUIS A. JONES,  
JAMES H. LINDSAY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,  
Washington, D. C."