R. W. SCOTT.

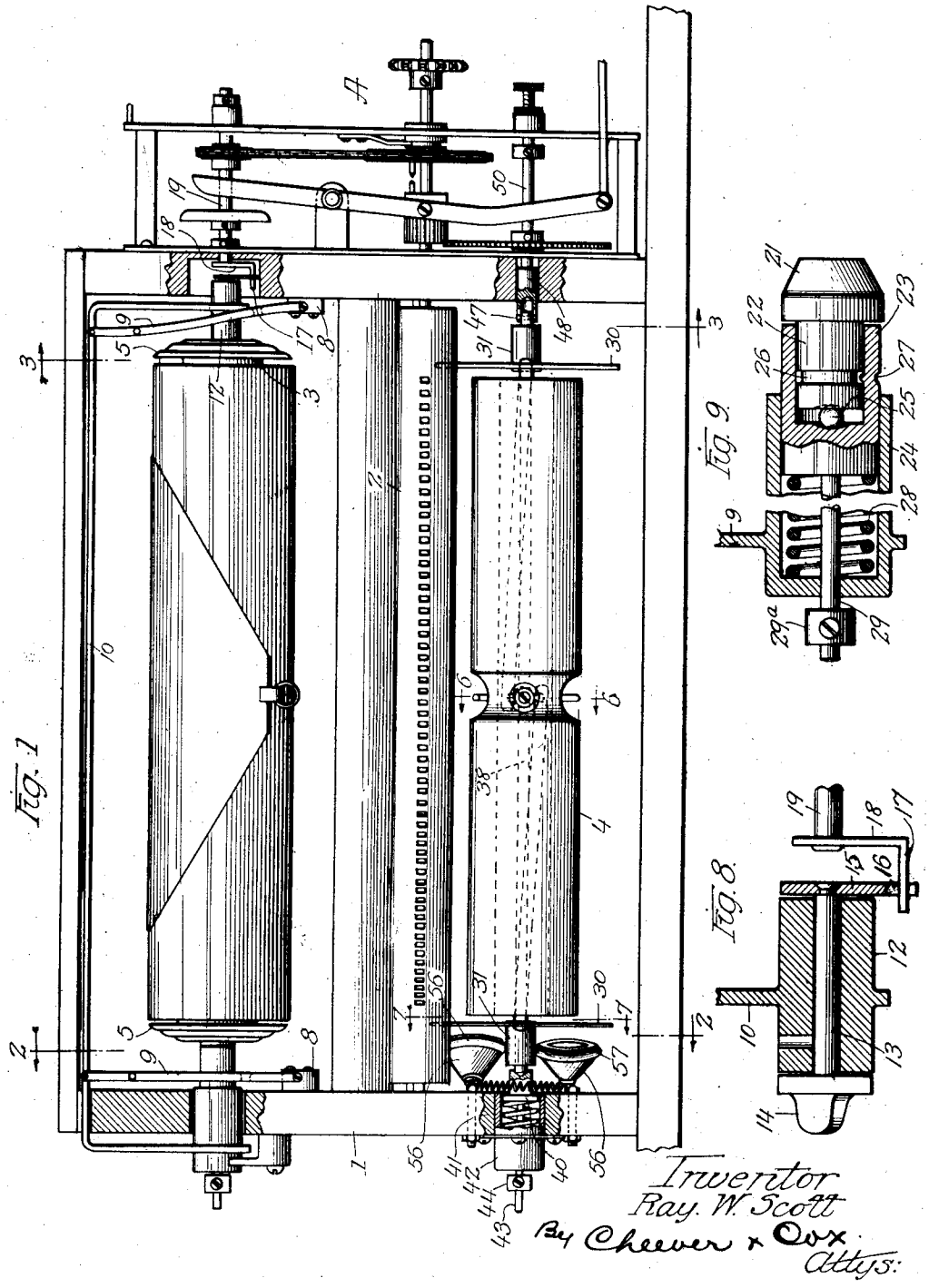
CENTRALIZING MECHANISM FOR MUSIC SHEETS.

APPLICATION FILED SEPT. 8, 1919.

1,357,352.

Patented Nov. 2, 1920.

3 SHEETS—SHEET 1.



R. W. SCOTT.

CENTRALIZING MECHANISM FOR MUSIC SHEETS.

APPLICATION FILED SEPT. 8, 1919.

1,357,352.

Patented Nov. 2, 1920.

3 SHEETS—SHEET 2.

Fig. 3.

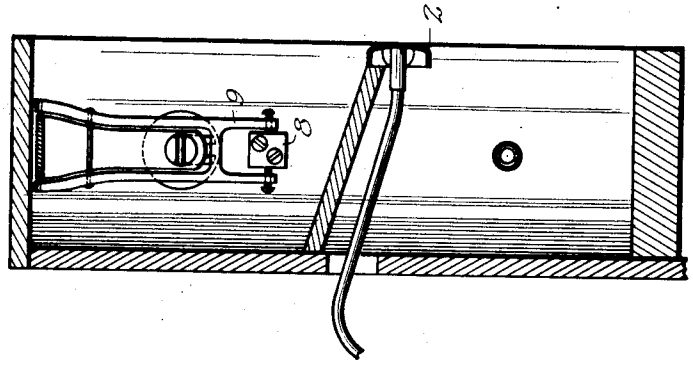
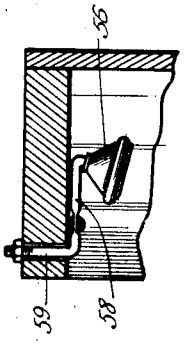


Fig. 4.



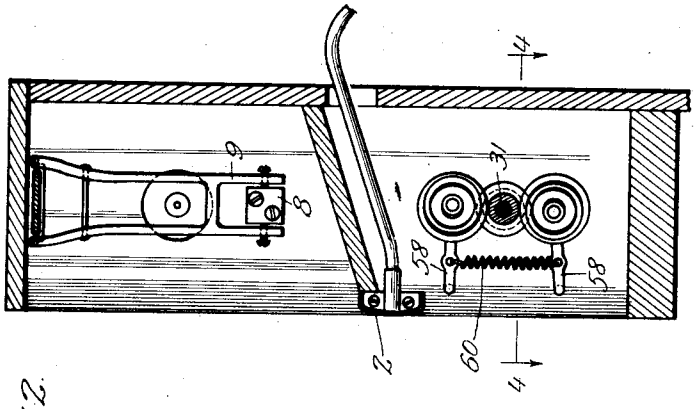


Fig. 2.

Inventor
Ray W. Scott
By Cheever & Cox
Attys.

R. W. SCOTT.

CENTRALIZING MECHANISM FOR MUSIC SHEETS.

APPLICATION FILED SEPT. 8, 1919.

1,357,352.

Patented Nov. 2, 1920.

3 SHEETS—SHEET 3.

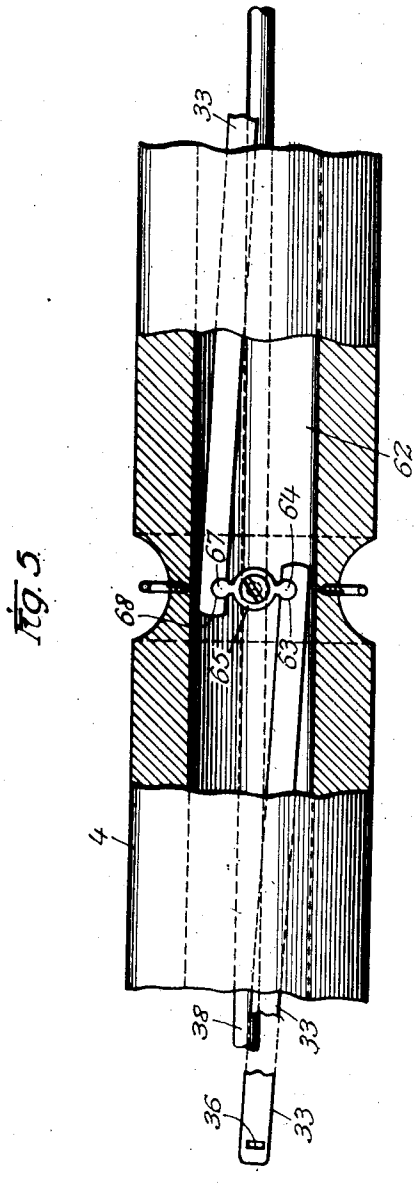


Fig. 5

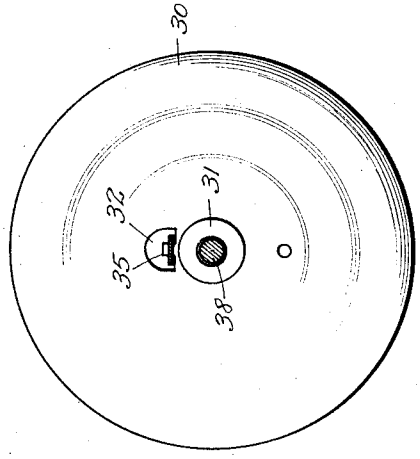


Fig. 7

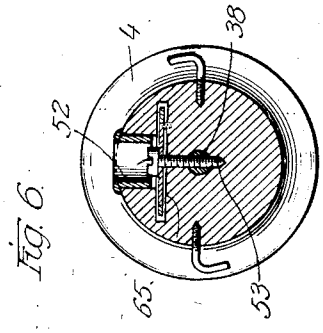


Fig. 6

Inventor
Ray W. Scott
By Cheever & Cox
Attys.

UNITED STATES PATENT OFFICE.

RAY W. SCOTT, OF NEW YORK, N. Y., ASSIGNOR OF ONE-FIFTH TO SCOTT PLAYER ACTION CO., OF RACINE, WISCONSIN, A CORPORATION OF ILLINOIS, AND FOUR-FIFTHS TO THE NORTHERN TRUST COMPANY, TRUSTEE, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

CENTRALIZING MECHANISM FOR MUSIC-SHEETS.

1,357,352. Specification of Letters Patent. Patented Nov. 2, 1920.

Application filed September 8, 1919. Serial No. 322,518.

To all whom it may concern:

Be it known that I, RAY W. SCOTT, a citizen of the United States, residing at New York city, State of New York, have invented a certain new and useful Improvement in Centralizing Mechanism for Music-Sheets, of which the following is a specification.

My invention relates to automatic musical instruments, more particularly to the centralizing mechanism for the music sheets. The general object of the invention is to provide means for maintaining the music sheet in central position and to enable the instrument to accommodate itself to sheets of varying width. As contributing to the general object of the invention it is my purpose, first, to provide a floating music spool adapted to move laterally under slight pressure; second, to provide a take-up spool having end flanges capable of varying their distance from each other; third, to provide means for equalizing the movement of the end flanges toward and from each other; fourth, to provide means whereby said end flanges are automatically urged inward while the music sheet is being wound up on the take up spool; fifth, to provide means whereby said end flanges are automatically urged outward during the rewinding process; sixth, to provide advantageous details of construction which will be hereinafter more specifically explained.

I accomplish my objects by the mechanism illustrated in the accompanying drawings in which,

Figure 1 is a front elevation partly in section of a music spool box of the general type commonly used in piano player actions, and similar instruments using a traveling perforated sheet in connection with a tracker bar.

Fig 2 is a sectional view on the line 2—2, Fig. 1.

Fig. 3 is a sectional view on the line 3—3, Fig. 1.

Fig. 4 is a plan section on the line 4—4, Fig. 2.

Fig. 5 is a front elevation partly in section of the take-up spool and the automatic compensating mechanism associated therewith.

Fig. 6 is a sectional view on the line 6—6, Fig. 1.

Fig. 7 is a sectional view on the line 7—7, Fig. 1.

Fig. 8 is a sectional detail showing the driving clutch mechanism for the music spool.

Fig. 9 is a sectional detail showing one form of bearing for the left end of the music spool.

Like numerals denote like parts throughout the several views.

In carrying out my invention, I provide, among other things, means for keeping the sheet centralized with respect to the tracker bar instead of adjusting the tracker bar to meet the variations in position of the music roll as has been a common practice heretofore.

In the specific form of mechanism selected to illustrate the principle of the invention, there is a frame 1, commonly known as the "tracker box." This contains the tracker bar 2, the music spool 3, and the take-up spool 4 as in the ordinary construction. The music spool is provided with end flanges 5, 5, and is supported upon bearings so constructed that the spool is capable of readily floating endwise. In the present form, the bearings include two stationary blocks 8, 8 secured to the inside of the end wall of the tracker box. Pivoted to the blocks, are two approximately upright links 9, 9, shown in Figs. 1, 2, and 3. These links are bifurcated at the upper end and between their branches support a yoke 10 the ends whereof bend downward. At the right or driving end, shown in side elevation in Fig. 3, the depending arm of the yoke supports an integral cylindrical bearing 12 shown in sectional detail in Fig. 8. This bearing is longitudinally bored to rotatably support a sub-shaft 13, the inner or left end of which has a key 14 adapted to enter a coöperating slot (not shown) in the right end of the music spool. At the outer or right end of the sub-shaft is rigidly fastened a clutch plate 15 the lower end of which has a notch 16 adapted to receive the horizontal finger 17 of the crank arm 18, said crank arm being rigidly fastened to a suitable driving shaft 19. Shaft 19 is driven by any suitable transmission mechanism A, a standard form of which is shown at the right end of Fig. 1 and need not be further described.

The left end of the music spool is sup-

ported by means, a suitable type of which is shown in detail in Fig. 9. A socket (not shown) is formed at the left end of the spool, this socket receiving the frusto conical head 21 of a pin 22 which fits in a counterbored plunger 23. This plunger is slidable within a shell 24 which like the bearing 12 is integral with the depending arm 9 of the yoke. The pin is freely rotatable in the plunger, and the end thrust is taken up by a ball 25. An annular groove 26 is formed in the pin, and an indentation 27 is formed in the wall of the bearing in such manner as to project slightly into said groove and prevent the pin from coming out of the plunger. The plunger is backed up by a light helical compression spring 28 and has a stem 29 which projects out through the rear end of the shell 24 and is there provided with a collar 29ª for limiting the movement of the plunger under the action of the spring. It will thus be evident that the take-up spool is capable of readily floating laterally; that is, endwise of the spool.

The take-up spool 4 has two flanges 30 which have hubs 31 fastened to them. The flanges have apertures 32 adapted to receive the ends of the links 33, as best shown in Figs. 5 and 7. The apertures are so configurated as to leave small tongues 35 which project through aperture 36 formed in the ends of said links. Thus the links and the flanges are articulately connected together. The hubs are longitudinally bored to receive the spool shaft 38. At the left end the shaft projects somewhat beyond the end of the hub and bears in a spring socket bearing 40 which is backed up by a helical compression spring 41 inclosed within a shell 42. Said socket bearing has a stem 43 which projects out through the end of the shell and is there provided with a collar 44 which is fastened to it by a set screw or other suitable means. This collar is adapted to abut the outer end of the shell, and thus limit the movement of the bearing toward the right. At the right end shaft 38 has a transverse pin 47 which fits in the slotted end of the socket bearing 48 which is rigidly fastened to the driving shaft 50. The consequence is that when power is applied to said driving shaft by the transmission or drive it in turn rotates the spool shaft 38.

An escutcheon 52 is sunk into the side of the spool, preferably at the center thereof, for permitting the insertion of a screw 53 which passes through a hole drilled in the spool shaft, and beyond it into the wood of the spool. This makes a secure fastening between the shaft and the spool and makes it certain that the parts will rotate in unison. These parts are shown in detail in Fig. 6.

At the left end of the spool are two friction rollers 56, which are provided with tires 57. These are preferably of rubber and make frictional engagement with the cylindrical surface of the hub 31. These rollers are rotatably mounted on arms 58 which have bends 59 forming shafts which bear in the end walls of the tracker box, as shown in detail in Figs. 2 and 4. A tension spring 60 connects the two arms 58 and serves to hold the tires in close frictional contact with the interposed hub. The axes of the rollers are obliquely arranged in such manner that they tend to move the interposed hub and the flange attached thereto toward the right when the spool is rotating in a direction to wind the music sheet onto it. Conversely, the rollers tend to move said hub and flange toward the left when the parts are rotating in the opposite direction: that is, during the operation of rewinding the music sheet onto the music spool 3.

I have provided means for causing the two flanges 30 to move synchronously, but in opposite directions lengthwise of the take-up spool so that said flanges will always move equal amounts in opposite directions. These means are shown in detail in Fig. 5. The link 33 which is attached to the flange at the left of the spool passes through a slot 62 which extends longitudinally through the spool from one end to the other. At its inner end said link has a notch 63 which forms a bearing for the rounded head 64 of the reversing or compensating lever 65. This lever is mounted upon the screw 53, shown also in Fig. 6. The pin thus serves the double function of acting as a pivot for said lever and as means for fastening the spool to the shaft 38. The lever has a second rounded head 67 similar to head 64 and this fits into the notch 68 formed in the second link 33. The result is that when the friction rollers 56 move hub 31 in an axial direction, the motion is transmitted to the reversing lever 65 through the connecting link, and this motion is transmitted in a reverse direction through the second link to the flange 30 at the right end of the spool. Thus the movement of the two flanges is always equal and opposite in direction.

The advantage of this construction lies in the fact that the flanges will always accommodate themselves to the width of the music sheet and will at the same time hold the music sheet accurately centered on the spool so that the apertures of the music sheet will always register accurately with the apertures in the tracker bar. In actual practice the width of different music sheets will vary considerably—for example as much as a sixteenth of an inch, more or less, due to inaccuracies of manufacture and to atmospheric changes which cause expansion and contraction of the paper. A variation of this kind is sometimes fatal to a proper playing of the instrument because in such case the apertures in the sheet do not register

accurately with the apertures in the tracker bar. But in an instrument provided with my mechanism the flanges will accurately accommodate themselves to the width of the paper as soon as one or two layers have been wound up upon the take-up spool and will thereafter hold the sheet correctly centered.

As a result of this invention the flanges 30 of the take-up spool are capable of moving toward and from each other, but as a result of the action of the reversing or compensating mechanism the distance of one flange from the center of the take-up spool will always be the same as the distance of the other flange from the center of the spool. During the playing of the sheet,—that is, during the operation of winding the sheet onto the take-up spool, the friction rollers 56 will gently urge the flanges toward the edge of the sheet, and hence will keep the sheet accurately centered, as previously stated. During the rewinding operation, as the take-up spool rotates in the reverse direction and the friction rollers are at an oblique angle, the flanges will tend to move outward sufficiently to release the edges of the paper, thus reducing the amount of friction and also the amount of wear upon the edges of the sheet.

As the music spool 3 is free to float laterally within reasonable limits, it will always shift its position automatically to a point where it will accommodate the sheet which is being centrally guided onto the take-up spool. That is to say, the sheet is always held accurately in central position by the flanges 30, and as the music spool is capable of moving endwise under slight pressure, it will always move to a position where the sheet will be centralized with respect to the tracker bar regardless of whether the sheet is accurately wound upon the music spool or not. Thus the music spool automatically accommodates itself to the position of the centralized sheet during the action of playing the instrument.

Having thus described my invention what I claim as new and desire to secure by Letters Patent, is:

1. In an automatic musical instrument controlled by perforated sheets, a take-up spool having flanges adapted to engage the edges of the sheet for guiding it onto the take-up spool, said flanges being axially movable, and means within the spool for causing them to move equal amounts in opposite directions.

2. In an automatic musical instrument controlled by perforated sheets, a take-up spool having flanges which are axially movable, a reversing lever within said spool, and means for connecting said flanges with said reversing lever whereby the flanges are caused to move equal amounts in opposite directions.

3. In an automatic musical instrument controlled by perforated sheets, a take-up spool having flanges which are axially movable, a reversing lever mounted within said spool, and links connecting the lever with the flanges whereby the latter are caused to move synchronously in opposite directions.

4. A sheet controlled automatic musical instrument having a take-up spool provided with axially movable flanges, and means located partly within the spool for urging the flanges toward each other when the spool is rotating in a direction to wind the sheet onto the take-up spool.

5. A sheet controlled automatic instrument having a take-up spool provided with axially movable flanges, and means adapted to urge the flanges toward each other when the spool is rotating in a direction to wind the sheet onto the take-up spool and to urge the flanges away from each other when the spool is rotating in the opposite direction.

6. Mechanism of the class described having a take-up spool, axially movable flanges, a friction device obliquely set with respect to the axis of the spool, and adapted to urge one of the flanges toward the middle of the spool when the spool is rotating in a direction to wind the sheet onto it and means for causing the second flange to move equal amounts in opposite directions from the movements of the first mentioned flange.

7. Mechanism of the class described having a take-up spool, axially movable flanges, a friction device set obliquely with the axis of the spool and adapted to urge one of the flanges away from the middle of the spool, when the spool is rotating in a rewinding directon, and means for causing the second flange to move equal amounts in opposite directions from the movements of the first mentioned flange.

8. In a sheet controlled musical instrument, a take-up spool, axially movable flanges, rotating in unison with said spool, one of said flanges having a hub, a friction roller having an axis arranged obliquely with respect to the axis of the spool and operative upon said hub to move the flange in an axial direction, and means for causing the second flange to move equal amounts in opposite directions to the movement of the first mentioned flange.

9. In a sheet controlled musical instrument, a take-up spool having an axially movable flange rotating in unison with the spool and having a hub, a pair of friction rollers having axes arranged obliquely with reference to the axis of the spool and adapted to engage the hub on substantially opposite sides thereof, means for urging said rollers into frictional engagement with the

hub whereby the hub and flange are caused to move axially when the spool and flange are rotated, a second flange for the opposite end of the spool, and means for causing said flanges to move equal amounts in opposite directions.

10. In an automatic musical instrument controlled by perforated sheets, an apertured tracker bar, a take-up spool, axially movable flanges for said spool, traction mechanism for constantly urging the flanges toward each other when the spool is rotating in a direction to wind the sheet onto it, said traction mechanism including friction wheels arranged at an oblique angle to the take up spool and equalizing means adapted to always hold the flanges centralized with respect to the tracker bar to thereby cause the perforations in the sheet to always register with the proper apertures in the tracker bar.

11. In an automatic musical instrument controlled by perforated sheets, an apertured tracker bar, a take-up spool, axially movable flanges for said spool, and means for constantly urging the flanges toward each other when the spool is rotating in a direction to wind the sheet onto it and for urging them outward away from each other when the spool is rotating in a direction to unwind the sheet from it.

12. In a sheet controlled musical instrument, the combination of a tracker bar, a take-up spool, axially movable flanges for said spool, equalizing means for maintaining always constant the two distances of the flanges from the center of the take-up spool to thereby hold the sheet centered with respect to the tracker bar, said equalizing means being located chiefly within the take-up spool, and traction mechanism coöperating with said equalizing mechanism for urging the flanges toward the center of the take-up spool when the latter is rotating in a direction to wind the music sheet on to it.

In witness whereof, I have hereunto subscribed my name.

RAY W. SCOTT.