No. 850,892. PATENTED APR. 23, 1907.

H. P. BALL.

MUSIC ROLL FOR MECHANICAL MUSICAL INSTRUMENTS.

APPLICATION FILED SEPT. 15, 1905.

FIG. 1.

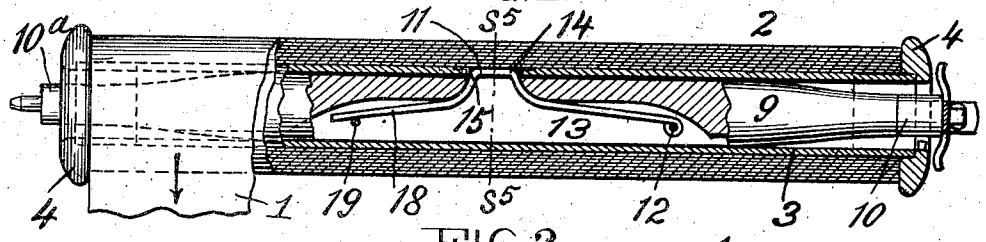

FIG. 2.

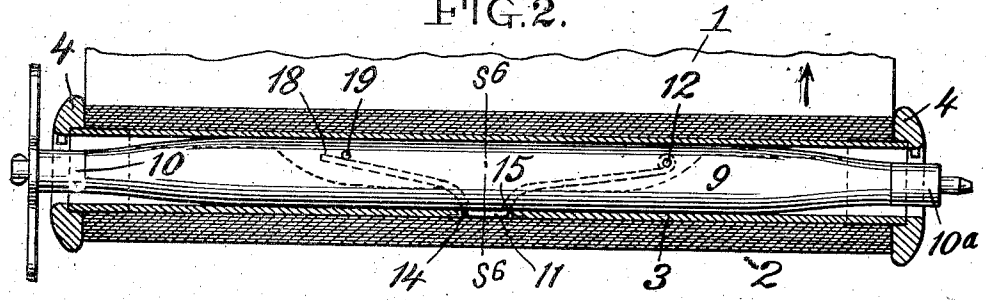

FIG. 3.

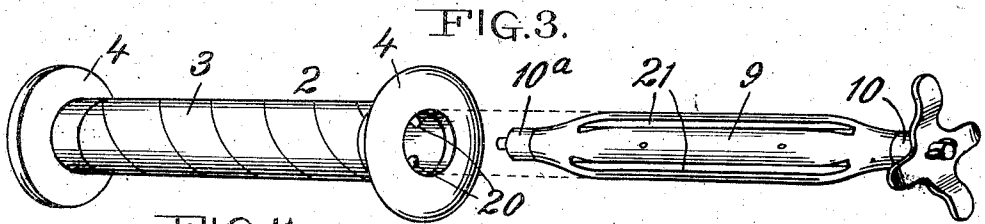

FIG. 11.



FIG. 12.

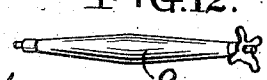

FIG. 4.

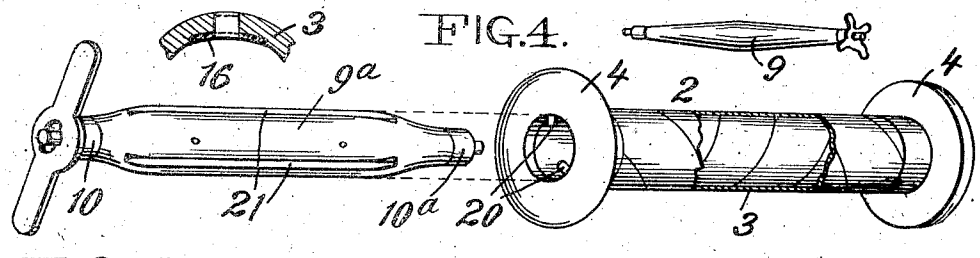

FIG. 5.

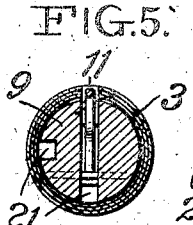

FIG. 6.

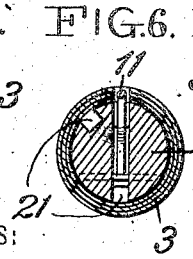

FIG. 7.

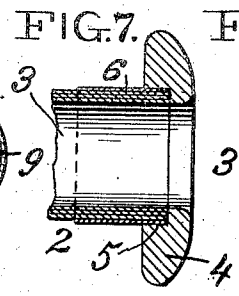

FIG. 8.

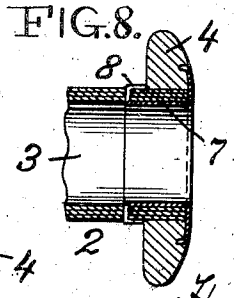

FIG. 9.

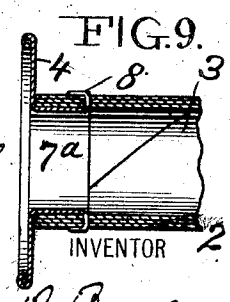

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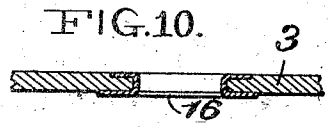
FIG. 10.



UNITED STATES PATENT OFFICE.

HENRY PRICE BALL, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO SAMUEL INSULL, OF CHICAGO, ILLINOIS.

MUSIC-ROLL FOR MECHANICAL MUSICAL INSTRUMENTS.

No. 850,892. Specification of Letters Patent. Patented April 23, 1907.

Application filed September 15, 1905. Serial No. 278,622.

To all whom it may concern:

Be it known that I, HENRY PRICE BALL, a citizen of the United States, residing at New York city, county and State of New York, have invented certain new and useful Improvements in Music-Rolls for Mechanical Musical Instruments, of which the following is a specification.

My invention relates generally to music-rolls for use in mechanical musical instruments, and more particularly to a support or mounting for such rolls.

The present practice of providing well-known types of mechanical musical instruments with special bearings for the music-rolls of a form and arrangement such that rolls for one instrument—for example, the pianola—are not suitable for use in another, as the angelus, has resulted in limiting the selection of music of that offered for sale by the maker or some one acting for the maker of the particular instrument used. In order to overcome this difficulty, my invention is designed to provide means by which the ordinary commercial music-rolls may be made interchangeable—that is to say, instantly adapted to any of the various types of mechanical musical instruments now in general use.

The accompanying drawings will serve to illustrate a device suitable for carrying my invention into effect. I wish it understood, however, that I do not limit myself to either the exact construction or arrangement of parts shown, as various changes may be made therein or the device embodied in other forms operating in substantially the same manner to produce practically the same result.

In the drawings, Figure 1 is a view, partly in section, showing a spindle or support for a music-roll of a form suitable for use in an instrument, known as the "pianola." Fig. 2 is a sectional view showing the music-roll carried by a spindle designed for use in another type of instrument, known as the "angelus." Fig. 3 is a view in perspective of the parts or members of the roll-support shown in Fig. 1. Fig. 4 is a similar view of the form shown in Fig. 2. Fig. 5 is a cross-section on the line s^5 s^5 of Fig. 1. Fig. 6 is a similar view on the line s^6 s^6 of Fig. 2. Fig. 7 is a detail sectional view of the end of the spool upon which the roll is wound. Fig. 8 is a similar view showing a slightly-modified construction. Fig. 9 illustrates a further modification thereof. Fig. 10 is a detail sectional view showing the central eyeleted opening of the spool. Fig. 11 is a cross-sectional view thereof; and Fig. 12 is a detail view in perspective, showing a modified form of spindle.

Referring now to the drawings, the music strip or roll 1 is shown wound upon a spool 2, consisting of a tubular body portion 3, of uniform diameter throughout its length and provided at its ends with flanges 4, the length of the spool between the flanges corresponding approximately with the width of the music strip or roll.

The body portion 3 of the spool may be constructed of any suitable material; but heavy paper is preferably employed, a strip of which is wound spirally into tubular form, first in one direction and then in the other, to give the thickness and length required, and is held together by paste or glue. To the tube thus formed rings or collars are fitted to serve as the end flanges 4 4 thereof and may be secured thereon in various ways—as shown, for example, in Figs. 7 to 9.

In Fig. 7 the collar is counterbored, as indicated at 5, to receive the end of the tube 3, which is fitted therein and secured by cement, glue, or the like. Interposed between the tube and collar there is a reinforcing-strip of linen or other fabric 6, which is wound upon the tube and extends a suitable distance inward beyond the flange thereof.

In Fig. 8 the collar is fitted upon the tube flush with the end thereof and secured thus by a reinforcing-band of metal 7, which is fitted in the end of the tube and has teeth or spurs 8 bent up to engage both the tube and the collar thereon.

In Fig. 9 the reinforcing-band 7^a and collar 4^a are struck up from a sheet-metal disk and secured, as in Fig. 8, by having teeth or spurs 8 bent up to engage the body of the tube.

The spool is designed as a support or carrier for the ordinary commercial music strip or roll, which is wound thereon in the usual manner and sold with it. In order now to adapt the roll for use in the different types of mechanical musical instruments now in general use, I employ in connection with the

spool a number of interchangeable spindles 9 9ª, &c., which differ one from the other only in having differently-spaced grooves therein, the purpose of which will be later on explained, and ends thereof formed as required to fit the bearings provided in such instruments.

The spindles are preferably constructed of wood tipped with metal, as indicated at 10 10ª, and are yieldingly held in the tubular body of the spool by a spring-catch 11.

A simple form of catch is shown in the drawings, which consists of a piece of spring-wire pivoted at 12 in a slot 13 of the spindle and bent up about centrally of its length to provide an engaging projection 14, which enters an opening 15 of the spool. The opening 15 is reinforced with a metal eyelet 16 of suitable form, as shown in Figs. 10 and 11, and the catch is yieldingly held in engagement therewith by having its free end 18 supported upon a pin 19, extending transversely of the slot in the spindle. The engaging projection 14 of the catch is arranged in such relation to the ends of the spindle as to center the roll relatively to the tracker-board of the instrument when engaging the eyeleted opening of the spool.

For purposes of illustration I have shown two spindles 9 and 9ª, one for use in the pianola and the other in the angelus. It will be observed that the spindles are oppositely disposed in the spools, as shown in Figs. 1 and 2—that is to say, the end 10 thereof, which interlocks with the rewinding-shaft of the instrument, is at the right in Fig. 1, as required in the pianola, and at the left in Fig. 2, as required in the angelus. This relation is essential in order that the music-strip may unwind from the top of the roll and move in the required direction, as indicated by the arrow, and it is therefore necessary when inserting the spindle in the roll to enter it from either the right or left, depending upon the instrument in which it is to be used. To prevent mistake in this regard, two or more studs or projections 20 are provided at each end within the spool and are differently spaced to enter correspondingly-spaced grooves 21, formed lengthwise of each of the spindles. As shown in Figs. 3 and 5, for example, the spacing of the grooves for the pianola-spindle is ninety degrees, while that shown in Figs. 4 and 6 for the angelus-spindle is nearly one hundred and eighty degrees, making it, therefore, impossible to enter a spindle at the wrong end of the roll. It will be evident that various modifications might be employed to effect the same result.

In Fig. 12 I have shown a slightly-modified form of spindle designed to provide for a limited equalizing action when through contraction and expansion of the music-strip the pull is greater along one edge of the music-strip than the other. For this purpose the spindle is oppositely tapered from the center toward the ends thereof, and as a result the spool will have a limited rocking action thereon, permitting the roll to adapt itself to variations in length along opposite sides thereof.

Having thus described my invention, I claim—

1. A support for a music-roll comprising a roll-carrying spool, a removable spindle supporting the spool, and self-acting locking means interposed between the spool and spindle.

2. A support for a music-roll comprising a roll-carrying spool, a removable spindle supporting the spool, and a self-acting engaging device for centering the spindle relatively to the spool.

3. A support for a music-roll comprising a roll-carrying spool, a removable spindle supporting the spool, and means for causing the spool and spindle to interlock automatically when operatively adjusted relatively to each other.

4. A support for a music-roll comprising a roll-carrying spool provided with shaped portions at its ends, and a plurality of interchangeable spindles each formed to coincide with certain of such shaped portions of the spool.

5. A support for a music-roll comprising a roll-carrying spool provided interiorly with shaped portions, and a removable spindle extending through the spool and formed to enter the same from one end only.

6. A support for a music-roll comprising a roll-carrying spool, the bore of the spool being differently shaped at its ends, and a removable supporting-spindle extending through the spool and formed to enter the same from one end only.

7. A support for a music-roll comprising a roll-carrying spool, differently-spaced projections at opposite ends within the spool, and a removable supporting-spindle having grooves registering with the projections at one end only of the spool.

8. A support for a music-roll comprising a roll-carrying spool recessed interiorly, and a removable spindle supporting the spool, said spindle being tapered toward opposite ends and provided centrally of its length with a spring-actuated projection entering the recess in the spool.

9. A spool for a music-roll comprising a body provided with flanges at its ends, and having terminal reinforcing means interposed and secured between the flanges and the body.

10. A spool for a music-roll comprising a cylindrical body provided with terminal flanges, and having its ends reinforced with encircling bands of fabric interposed and adhesively secured between the body and the flanges thereof.

11. A spool for a music-roll comprising a tubular body of greater thickness at its ends than at its middle portion, and terminal flanges secured to the ends of said tubular portion.

12. A spool for a music-roll comprising a tubular body, the thickness of which is increased at its ends by encircling bands of fabric, and terminal flanges upon the tubular body adhesively secured to the fabric.

13. A support for a music-roll comprising a spool of uniform internal diameter throughout its length, and a spindle extending through the spool and of varying diameter throughout portions of its length within the spool.

14. The combination of a music-roll, and a supporting-spindle therefor, said spindle being tapered in opposite directions throughout portions of its length.

15. A support for a music-roll comprising a tubular spool, and a spindle having a diameter at its center to conform to the internal diameter of the spool and provided with tapered end portions.

16. A support for a music-roll comprising a spool, and a separable spindle extending through the spool, said spindle being oppositely tapered toward its ends and provided with a clutch member at its center.

17. A support for a music-roll comprising a plurality of spindles of different forms, and a spool adapted to separately receive each spindle.

18. A support for a music-roll comprising a plurality of spindles of different forms, a spool adapted to separately receive the spindles, and means effective when the spool and a spindle are operatively assembled for connecting them in driving relation.

In testimony whereof I affix my signature in the presence of two witnesses.

HENRY PRICE BALL.

Witnesses:
W. H. PUMPHREY,
M. G. CRAWFORD.