

No. 669,342.

Patented Mar. 5, 1901.

R. A. GALLY.
COMPENSATING MUSIC SPOOL.

(Application filed Sept. 15, 1900.)

(No Model.)

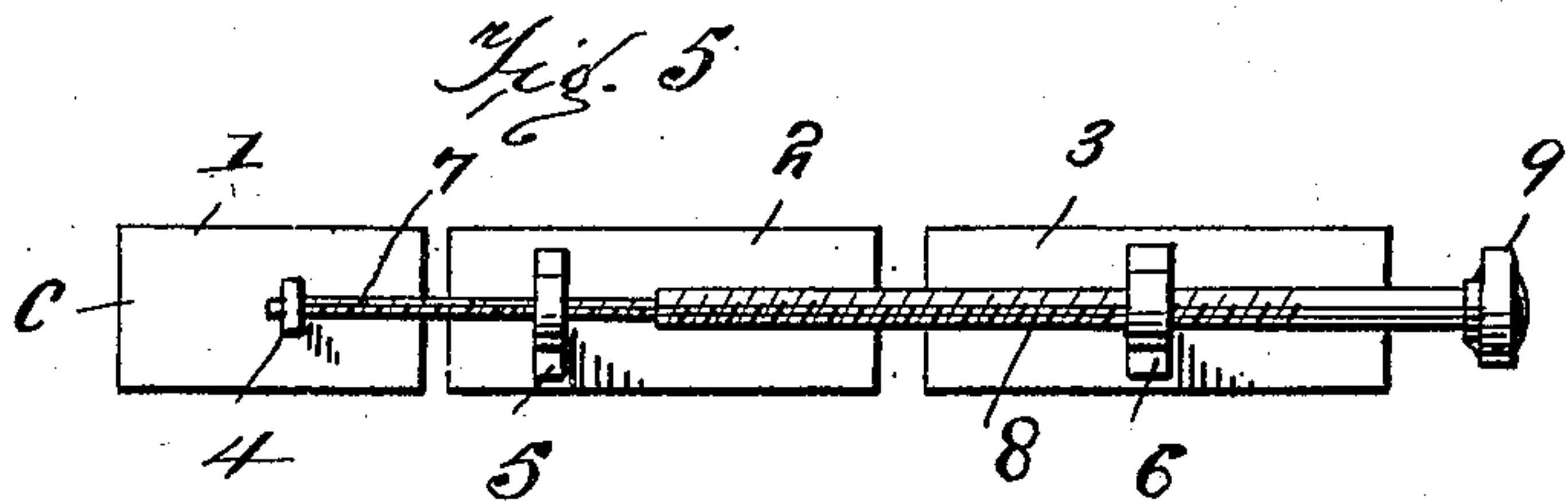
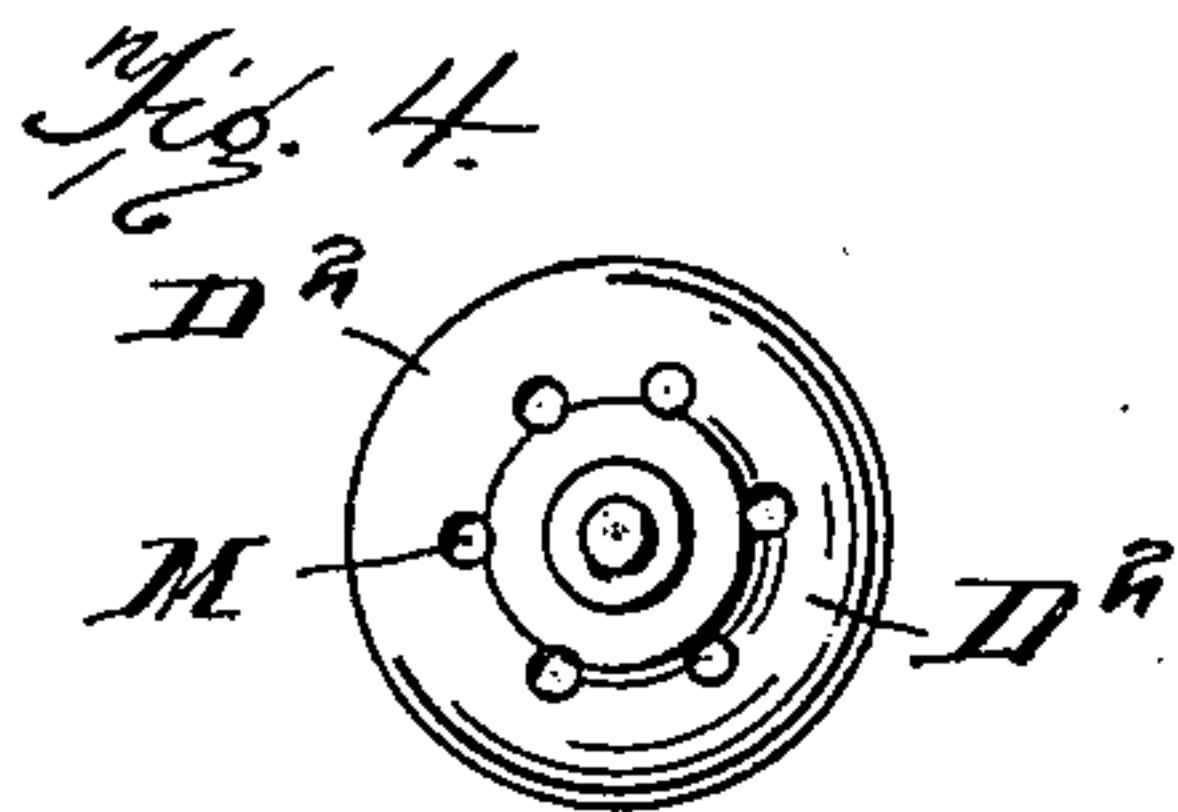
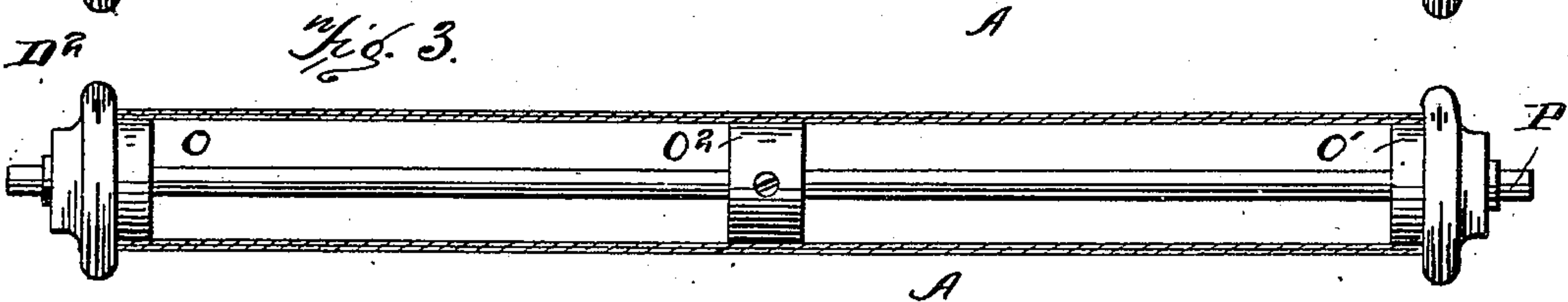
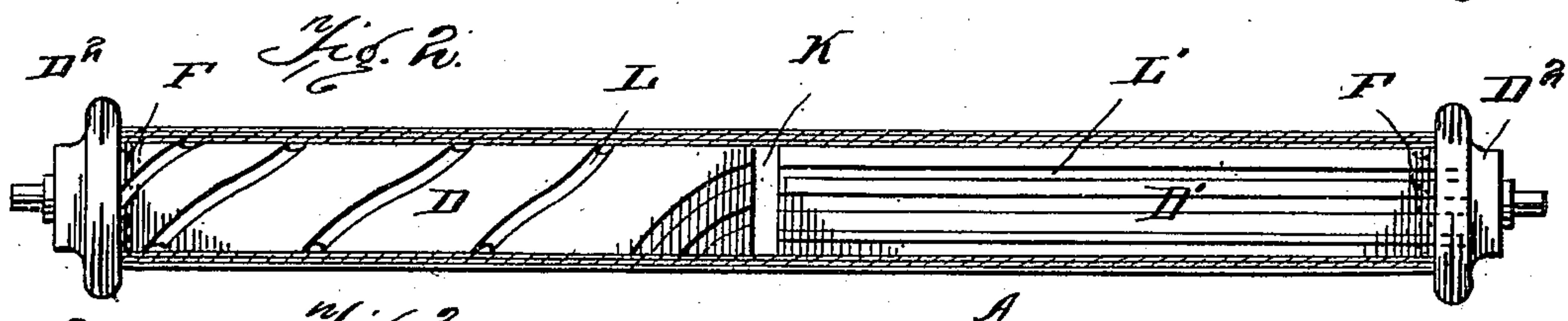
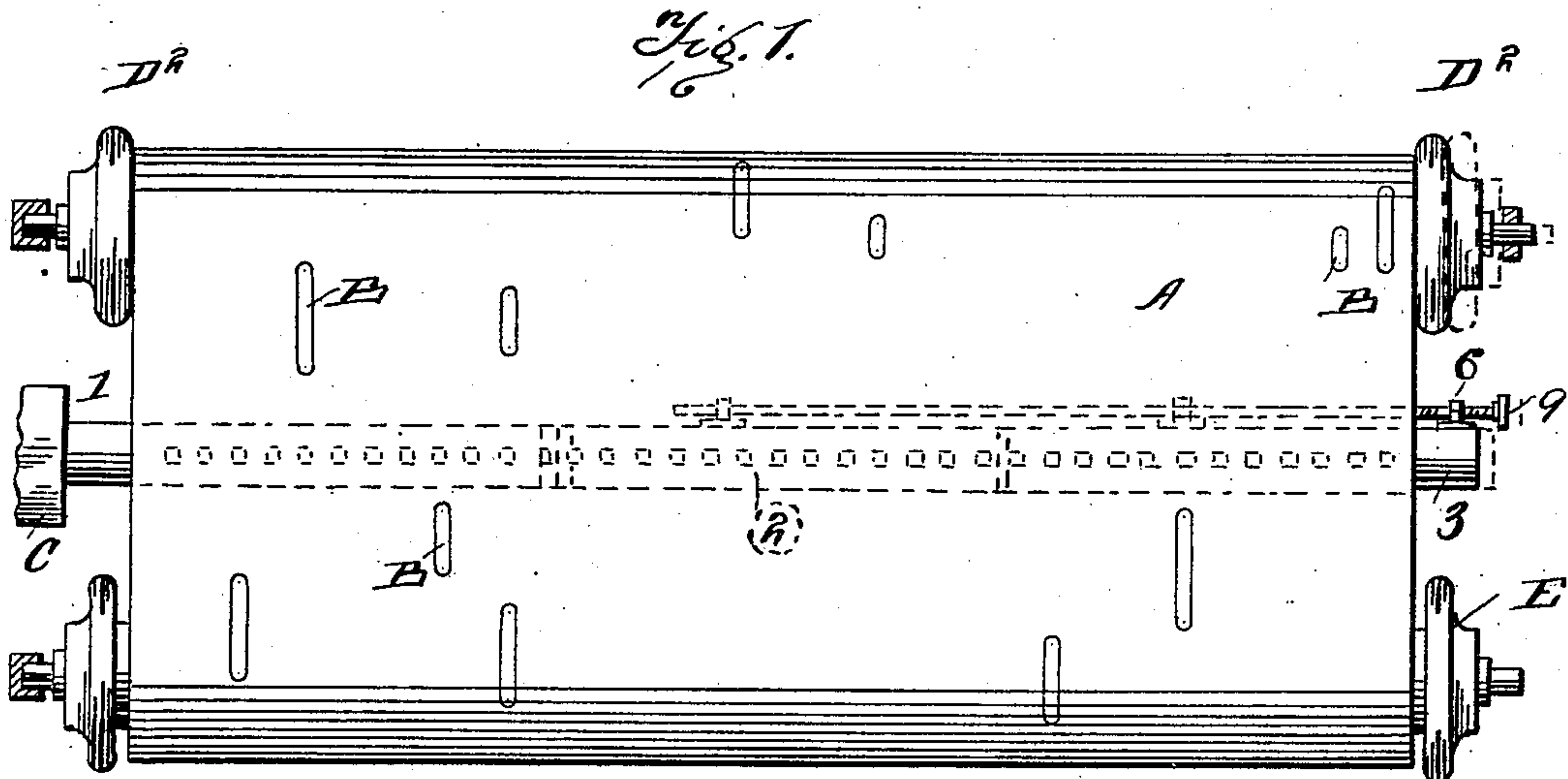
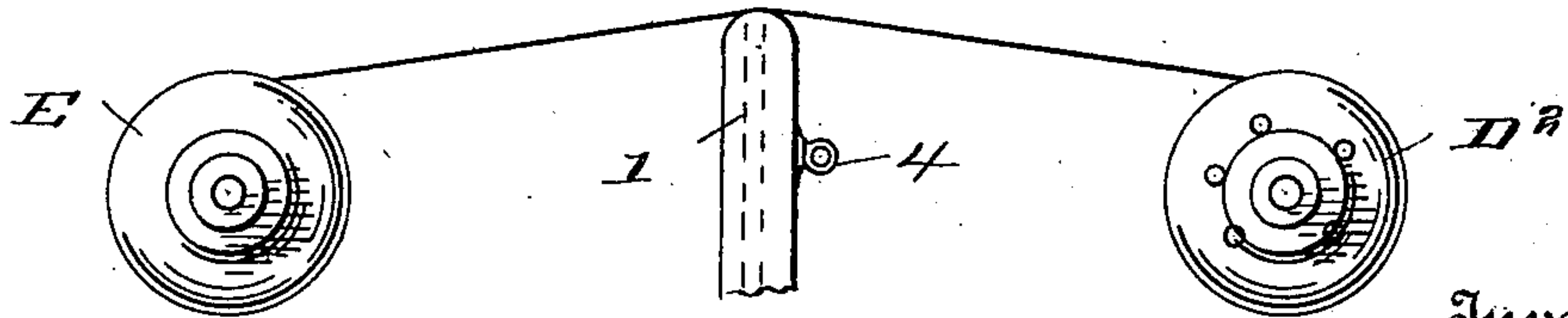


Fig. 6.



Witnesses
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UNITED STATES PATENT OFFICE

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COMPENSATING MUSIC-SPOOL.

SPECIFICATION forming part of Letters Patent No. 669,342, dated March 5, 1901.

Application filed September 15, 1900. Serial No. 30,133. (No model.)

To all whom it may concern:

Be it known that I, ROBERT A. GALLY, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Compensating Music-Spools, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to compensating spools for music rolls or sheets for automatic musical instruments.

The art of operating musical instruments by means of a paper sheet having numerous perforations therein is well known. The paper passes lengthwise over what is called a "tracker," in which tracker are air-ducts of such size as to be closed by the unperforated sheet, but opened separately as a perforation in the paper tracks or travels over the tracker. Paper is subject to atmospheric changes and expands or contracts in width under the influence of moisture. Consequently while the tracker remains of uniform length the width of the paper sheet may become less or more and the perforations in the sheet do not register or track. Again, the paper must be guided accurately to the tracker and is usually guided by arranging the spool on which the paper is wound in proper alinement with the tracker; but these spools are generally of wood and do not expand and contract with the paper, so if the spool be of a length to accurately fit the paper under one condition of moisture it may not fit under other conditions, and the edge of the sheet is either not supported by the spool-flange, and so not correctly guided, or the edge of the paper bears too much against the spool-flanges and is crumpled or torn. To remedy these defects, I make a compensating spool to be used with a tracker, as will be explained.

Figure 1 is a plan of compensating spool and tracker-range and music-sheet. Fig. 2 is a section of a music-roll having spool with ventilating-grooves and arranged to automatically compensate for expansion and contraction. Fig. 3 is an elevation of a modification of spool, showing winds of paper in section. Fig. 4 is an end view of spool, showing ventilating-passages. Fig. 5 is a side elevation of tracker-range. Fig. 6 is an end

view of spool, winding-drum, and tracker-range arranged to show the general relation of parts.

The music-sheet A is of usual construction provided with holes B, arranged in rows. The holes in tracker-range C are indicated in dotted lines, Fig. 1. The spool is divided in Fig. 2 into sections D D'. Each section makes half of the completed spool, and each has a flange D². The music-sheet is pasted or glued to the spool-sections only near the flanges, as at the dotted points F, Fig. 2. Then the sheet which is not perforated clear to the end is wound a few turns about the spool-sections and itself forms a cylinder on which the perforated part or "tune" is wound. The break K between the spool-sections may be of greater or less width; but, as described, the spool-sections are independent of each other save as they are connected by the paper sheet wound about both the cylinders of the spool and between the flanges D². As the spool ends are thus independent they will simply follow the expansion and contraction of the paper, and as the paper expands in width the flanges will be farther apart, as indicated in dotted lines, Fig. 1. The winding-drum E is of any desired length exceeding the width of paper, so that the paper has plenty of room thereon. The winding-drum need not compensate, although it may do so and may be like the spool. When the paper expands in width, owing to different conditions of moisture, the instrument permits one end to yield. One end of the spool and edge of the paper is preferably the gage and always maintains its relation to the tracker. The other end of spool and edge of paper will "go and come," and so will bear an irregular and sometimes inoperative relation to a fixed tracker.

To compensate for the expansion of paper, the tracker may be divided and one or more sections made adjustable. A convenient adjustment is shown in Figs. 1 and 5. The tracker-range is divided vertically into three parts 1 2 3. Part 1 is fixed to the instrument. Parts 2 and 3 are movable in the direction of the length of the tracker or width of paper sheet, the connections of air-vents to the wind of the instrument permitting such adjustment

by means not necessary to be here shown, as by common flexible tubes.

The expansion of paper is substantially uniform, so that the rows or "tracks" of holes are each separated from the neighboring row a little wider when the paper is expanded than when it is contracted; but this difference is so very small that an adjustment of a part of the range for a distance equal to the average expansion of the paper which passes over it is sufficient for practical purposes. Thus if the part 2 of the tracker be adjusted one or two centimeters and the part 3 be simultaneously adjusted two or four millimeters conditions of ordinary usage will be complied with, the initial edge of the sheet passing over the left-hand edge of part 1 being the gage.

To adjust the tracker easily, a screw-shaft extending lengthwise of the range has a rotary bearing in socket 4 on tracker-section 1. The screw has a slow-threaded section 7, passing through a nut 5, attached to tracker-section 2, and a quick-thread 8, engaging nut 6, attached to tracker-section 3. When the shaft is turned by means of head 9, tracker-section 3 will be moved a longer distance according to the pitch of thread 8, section 2 will be moved a lesser distance by means of thread 7, and section 1 will not be moved.

The amount of adjustment of the tracker-range when the compensating spools above described are used can be found by looking across the spool-flange when the sheet of music is in place on the instrument, or the sheet may have special perforations to act as gage in adjusting the tracker.

As a modification of the spool the flange-pieces O O' may be made much shorter in the cylindrical parts and a piece O' of similar diameter may be fixed to a central shaft P, the end pieces being free to move thereon. The paper being glued at the edges to cylinders O O' and at the middle to cylinder O² and wound a few times around the cylinders will form a cylinder to receive subsequent coils and will be self-compensating, but will gage from the middle instead of one end. In such case less adjustment of the tracker is requi-

site and the tracker-sections may be adjusted with the middle section fixed.

The tracker adjustment and spool compensation are merely to overcome defects in the material, (paper,) which would not exist if the paper sheet were not affected by atmospheric conditions. To minimize the expansion and contraction and to permit drying of moist rolls, it is desirable to have the paper-spool ventilated. This I effect by spiral grooves L in the cylindrical part of the spool or by flutings L', the grooves or flutings in either case extending through the flanges, as indicated at M. In a dry atmosphere a music-roll will dry much more rapidly and will generally maintain a better condition than where the cylinder is solid.

From the modifications submitted and from the claims it will be understood that I consider my invention generic and not in its broad sense limited to the particular constructions shown, although such are in my opinion the best now known to me.

I do not herein claim the divided tracker, the same being shown, described, and claimed in a divisional application filed by me January 29, 1901, Serial No. 45,217.

What I claim is—

1. A compensating spool for music-sheet rolls, having separate heads attached only to the edges of the sheet, and self-adjusting as the sheet expands or contracts in width.

2. A compensating spool consisting of two parts, each having a flange and a cylinder, combined with a music-sheet roll attached at its edges to the cylinders and bearing against the flanges, and having a number of turns about the cylinder.

3. A music-sheet spool having air-passages along its cylindrical part, and vents to said passages through the spool-flanges.

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

ROBERT A. GALLY.

Witnesses:

MARY A. GALLY,
EDWARD F. COYLE.