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COMPLETE SPECIFICATION.

Improvements in Means or Apparatus for Holding the Music Discs in Mechanical musical Instruments.

I, Dr. FRIEDRICH ADOLF RICHTER, of 65, Schwarzburger Strasse, Rudolstadt, Thuringen, in the Empire of Germany, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

5 This invention relates to mechanical musical instruments of the class in which the reeds are operated by levers, star-wheels or the like actuated by slots or tongues provided in or on the face of a circular, preferably metallic disc more generally known under the term of note-sheet or "note-disc," said note-disc being adapted to be placed on the horizontal plate of usual and well known
10 construction carried by a spring actuated vertical or main shaft of the instrument so as to rotate therewith, thereby actuating the playing levers or wheels or the like, and to allow of the note disc being removed therefrom at any time.

The object of this invention is to provide means for enabling the disc to be readily placed on and removed from the instrument especially for efficiently
15 maintaining at any position, vertical or inclined, the arm or holder for securing the note-disc to said plate and further to provide special means operated by said holder for stretching, holding and guiding the note-disc in proper position, when the tune is being played, said means being simple in construction and at the same time adapted to operate satisfactorily, in that the disc may be placed on
20 the parts of the instrument provided therefor without thereby becoming deformed or uneven and so that the said disc can be easily removed therefrom and replaced when desired.

To this end my invention consists in the arrangement and construction of parts as hereinafter more fully described, said parts comprising essentially an
25 arm or holder with one end hinged or pivotally connected to the frame in the usual manner, said holder being provided with a friction device at its hinged end for maintaining the holder in any desired position when turned upwards, and further comprising a rotary disc provided in the holder and a series of pairs of rolls operated by the holder for evenly holding, stretching and guiding
30 the note-disc in the manner required for efficiently actuating the playing mechanism without thereby producing the noise caused in the instruments heretofore known by the undulatory movement of the disc.

The friction-device at the hinged end of the holder consists of one or two
35 pulleys attached to the elongated pins or pivots of the holder and provided with a brake strap or with two such straps, respectively, with one end connected to a spring fixed to the frame and the other end attached to the frame itself. The means for holding, stretching and guiding the disc in accordance with and in dependency on the movement of the holder consist, respectively, of a rotary disc arranged in the middle of the arm or holder (provided the holder is made
40 of such a length as to extend over the note-disc from end to end), so as to press upon and hold the central portion of the note-disc as the holder is turned downwards into its locking position, thereby co-operating with said rotary disc to

[Price 8d.]



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keep the note disc in proper position for actuating the playing mechanism, and of a lever and sliding rolls arrangement controlled by and co-operating with said holder for holding, stretching and guiding the marginal part of the note-disc in accordance with and in dependence upon the movement and position of the holder. If the holder is made only about half the length of the diameter of the note-disc, the rotary disc is provided at the inner or free end of the holder.

In the accompanying drawings

Figures 1 and 2 are, respectively, a plan and an elevation of the arm or holder in its closed position on the frame.

Figure 3 is a plan of the holder provided with the rotary disc in the middle thereof.

Figure 4 is an elevation of the middle portion of the latter with the lateral parts broken away, and

Figure 5 is an elevation of the holder shown in Figure 3 partly in section and with some of the parts broken away.

Figure 6 is an elevation of the guiding or holding and stretching device operated by and co-operating with the holder shown in its open or raised position, the fore-part of the latter being broken away.

Figure 7 is a similar view with the parts in their closed position, and

Figure 8 is a plan according to Figure 7 with certain parts broken away.

The arm or holder *c*, see Figures 1 and 2, is hinged or pivotally connected to the posts *b* on the bottom plate *a* forming the frame, by means of the pins or pivots *d* extending from the holder through holes provided in the posts for the purpose. On the projecting ends of the pins and in proximity to the posts, pulleys *e* and *e*¹ are mounted, separate straps *f* and *f*¹ attached at one end to the posts, and at the other to the free ends of strong springs *h* being passed around the pulleys so that the said straps will exert under the influence of the springs a braking strain or a frictional stopping effect on the pulleys and consequently on the holder as the latter is turned on its pivot. By these means the holder is enabled to maintain or keep any inclined or erect position into which it may be moved, without requiring a special abutment or any device affording a stop to the holder when thus removed from its horizontal or locking position. It is obvious that in lieu of the two pulleys I may use a single pulley without thereby departing from the nature of my invention, and the said single pulley may be mounted on either of the two pivots of the holder or, arranged in the middle of the pin or axle forming the pivots of the holder. In this case the end of the latter must be properly recessed so as to form two branches between which the pulley is arranged on the pin with the ends of the latter held by the said branches.

In order to avoid any undulatory movements of the note disc which would cause disturbing noises during its rotation, I provide in the holder a disc *m* with a central bowl fitting snugly the prominent central part of the base plate *o* covering the top of the vertical shaft *n*, see Figures 4 and 5, and serving as a support for the central portion of the note-disc. From said disc *m* an arm projects upwards connecting the disc by means of a ball and socket joint *k* to the circular casing *i* forming the middle portion of the holder, a spring *l* being provided in the socket operating to press the disc *m* downwards towards the base plate *o*. Supposing the note-disc *p* to have been placed on the plate *o* and the holder *b* then turned downwards and locked at its free end, it will be seen that the disc *m* under the pressure of the spring *l* will continuously bear against the central portion of the note-disc thereby causing the latter to lie flat and even on the base plate *o* and to remain in the stretched state during the time the instrument is playing notwithstanding the tendency to undulatory movements arising in the note-disc from the rotary movements imparted thereto while being carried around together with the plate *o* and the disc *m*.

The lever and stretching rolls arrangement operated by the holder consist of

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a pair of bent levers or bars u and u^1 , see Figures 6, 7 and 8, guided so that when the holder is being turned upwards, the pins t provided on the outer faces of the pulleys e and e^1 co-operate with the slots v in the vertical arm of said levers so that the latter will be pushed forward and be retracted again when the holder is removed to its horizontal or locking position. At the ends of the bottom plate a there are two pairs of arms suitably hinged to the plate, each of said arms carrying a roll r^1 r^4 at its free end. Owing to their gravity or to springs provided for this purpose, said arms assume a low or inclined position, see Figure 6, when the holder is turned upwards; but will be moved upward and brought to a more or less vertical position, see Figure 7, by the pins w and w^1 respectively provided on the levers u and u^1 and pressing towards said arms, when the holder is turned downwards again, so that said rolls co-operate with the rolls s^1 and s^2 provided on either end of the holder to stretch, hold and guide the note-disc placed between them.

During the time the rolls r^1 and r^4 arranged at the ends of the bottom plate are actuated so as to change their position in accordance with and in dependence upon the position of the holder, the levers u and u^1 also act upon a set of suitable arranged levers preferably four in number and carried by four branches of the bottom-plate a , so that four sets of guiding rolls suitably provided at the ends of said branches will co-operate with the rolls r^1 r^4 to hold, stretch and guide the note-disc when a tune is being played. The mechanism operating said four sets of rolls shown in Figures 6 to 8, consists of the levers x supported by the branches 2 of the bottom-plate and having noses at one end extending towards and embracing the bars and carrying at their other ends short arms 3 and 4 each provided with a roll r^2 and r^3 , respectively, at its upper end and with a sliding lever pivotally connected to the arms 3 and 4 extending through holes in the ends of the branches, said sliding levers also carrying rolls s at their upper ends.

When the holder c is given an upright or inclined position, the noses of the levers x embrace the horizontal arms of the bent levers u u^1 at a point where the latter are recessed, see Figure 6, so as to allow the outer arms of the levers and hence the rolls r^2 and r^3 to assume a low position owing to the pressure of springs attached to the branches and acting with their free ends upon the levers. At the same time the sliding levers carried by the arms 3 and 4 descend and are forced to slide with their tapered lower ends on the upper surface of the branches 2 so that the rolls s carried by said levers move outside in a radial direction and away from the rolls r^2 r^3 , thus allowing the note-disc to be removed from the instrument and to be replaced by another.

When the holder is turned back again to the horizontal or locking position the aforesaid bars u u^1 take the position shown in Figure 7, thereby allowing the levers x to return to the horizontal position under the action of their springs and further allowing the sliding levers to slide back to their vertical position under the action of their springs z so that the rolls s come again in contact with the rolls r^2 r^3 or with the note-disc placed upon the latter, thereby assisting to hold, stretch and guide the disc so as to prevent it from undulatory movements when rotating while the instrument is playing.

It is obvious that in doing this the said four sets of rolls co-operate with the sets of rolls provided at either end of the holder and of the bottom-plate, and further from the described mode of operation of the said co-operating sets of rolls it will be seen that a holding stretching and guiding device of this kind is by far more efficient in use than the devices heretofore known for the purpose and consisting essentially of sets of rolls, the lower of which are fixed rolls, that is to say rolls unchangeable in their vertical positions. Rolls of this kind evidently are most inconvenient as regards the difficulties existing in placing a note-disc of a large size between the guiding rolls and, further, as regards the inconveniences consisting in that a large disc tends to become uneven when being placed on and guided by said fixed rolls.

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I wish it to be understood that I do not confine myself to the exact details of construction or arrangement described and shown, as these admit of various modifications and variations within the scope of this invention.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A mechanical musical instrument comprising a mechanism for reproducing the tunes from a circular note-disc, and a device for holding the note-disc in proper position on the parts supporting the same, said device consisting of an arm or holder having a frictional brake at its hinged end for maintaining the holder when in open position and a rotary disc at the part thereof corresponding to the centre of the note-disc for holding and guiding the central part of said note-disc and of a series of pairs of rolls operated by the holder so as to change their position in the vertical direction and co-operating therewith to hold and guide the note-disc, substantially as described. 10 15
2. In a mechanical musical instrument having a mechanism for reproducing the tunes from a circular note-disc, the combination of an arm or holder having at its hinged end one or more pulleys with a spring-controlled brake-strap thereon for maintaining the holder in any upright or inclined position given to the holder on disengaging it from the note-disc, substantially as described. 20
3. In a mechanical musical instrument having a mechanism for reproducing the tunes from a circular note-disc, the combination of an arm or holder with one end hinged to the bottom plate, a rotary disc connected to the holder by a ball and socket joint, a spring provided in said joint between said ball and the socket and a base plate provided on the vertical or main shaft of the instrument to support the note-disc so as to allow the spring-controlled rotary disc to press the central portion of the note-disc gently and evenly towards the said base plate, substantially as described. 25
4. In a mechanical musical instrument having a mechanism for reproducing the tunes from a circular note-disc, the combination of an arm or holder having at its hinged end one or more pulleys with a brake-strap thereon, and having a rotary disc connected to the holder by a ball and socket joint to hold flat the central part of the note-disc, during the play of the instrument, substantially as described. 30
5. In a mechanical musical instrument having a mechanism for reproducing the tunes from a circular note-disc, the combination with an arm or holder with one end hinged to the bottom plate, of a series of pairs of rolls arranged at different points of the frame corresponding to the circumferential line of the note-disc and a lever arrangement for operating the rollers by means of the holder in order to displace them in vertical and in radial directions, respectively, in accordance with and in dependence upon the movement of the holder, substantially as described. 35 40
6. In a mechanical musical instrument having a mechanism for reproducing the tunes from a circular note-disc, the combination with an arm or holder with one end hinged to the bottom plate, of a rotary disc connected to the holder by a ball and socket joint, a series of pairs of rollers arranged at different points of the frame corresponding to the circumferential line of the note-disc and a lever arrangement for operating the rollers by means of the holder in order to displace them in vertical and in radial directions, respectively, in accordance with and in dependence upon the movement of the holder, substantially as described. 45 50
7. In a mechanical musical instrument having a mechanism for reproducing the tunes from a circular note disc, the combination of an arm or holder having at its hinged end one or more pulleys as described with a spring-controlled brake-strap thereon for maintaining the holder in any upright or inclined position given to the holder on disengaging it from the note-disc, a series of pairs of rollers 55

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arranged at different points of the frame corresponding to the circumferential line of the note-disc and a lever arrangement for operating the rollers by means of the holder in order to displace them in vertical and in radial directions, respectively, in accordance with and in dependence upon the movement of the holder, substantially as described.

8. In a mechanical musical instrument having a mechanism for reproducing the tunes from a circular note-disc the combination with an arm or holder having at its hinged end one or more pulleys as described with a brake-strap thereon, and having a rotary disc connected to the holder by a spring-controlled ball and socket joint to hold and guide the central part of the note-disc of a series of pairs of rolls operated by said holder and co-operating therewith to hold and guide the marginal part of the note-disc, substantially as described.

9. In a mechanical musical instrument having a mechanism for reproducing the tunes from a circular note-disc the combination with an arm or holder having at its hinged end one or more pulleys as described with a brake-strap thereon, and having a rotary disc connected to the holder by a spring-controlled ball and socket joint to hold and guide the central part of the note-disc of a series of pairs of rolls arranged at different points of the frame corresponding to the circumferential line of the note-disc and a lever arrangement for operating the rollers by means of the holder in order to displace them in vertical and in radial directions, respectively, in accordance with and in dependence upon the movement of the holder, substantially as described.

10. In a mechanical musical instrument having a mechanism for reproducing the tunes from a circular note-disc the combination with an arm or holder with one end hinged to the bottom plate, of a series of pairs of rolls arranged at each end of the bottom plate and of the holder and at the free ends of branches projecting from the bottom plate, and a lever arrangement for operating the rolls by means of the holder in order to displace them in vertical and in radial directions, respectively, in accordance with and in dependence on the movement of the holder, substantially as described.

11. In a mechanical musical instrument having a mechanism for reproducing the tunes from a circular note-disc the combination with an arm or holder having at its hinged end one or more pulleys as described, with a spring-controlled brake-strap thereon for maintaining the holder in any desired upright or inclined position given to the holder on disengaging it from the note-disc, of a series of pairs of rolls arranged at each end of the bottom plate and of the holder and at the free ends of branches projecting from the bottom plate, and a lever arrangement for operating the rolls by means of the holder in order to displace them in vertical and in radial directions, respectively, in accordance with and in dependence on the movement of the holder, substantially as described.

12. In a mechanical musical instrument having a mechanism for reproducing the tunes from a circular note-disc the combination with an arm or holder with one end hinged to the bottom plate, of a rotary disc connected to the holder by a ball and socket joint, a spring provided in said joint between the ball and the socket, a base plate provided on the vertical or main shaft of the instrument to support the note-disc so as to allow the rotary disc to press the central portion of the note-disc towards the base plate, and a series of pairs of rolls arranged at each end of the bottom plate and of the holder and at the free ends of branches projecting from the bottom plate, and a lever arrangement for operating the rolls by means of the holder in order to displace them in vertical and in radial directions, respectively, in accordance with and in dependence on the movement of the holder, substantially as described.

13. In a mechanical musical instrument having a mechanism for reproducing the tunes from a circular note-disc the combination with an arm or holder having at its hinged end one or more pulleys as described with a spring-controlled brake-strap thereon, of a rotary disc connected to the holder by a ball and socket joint, a spring provided in said joint between the ball and the socket, a

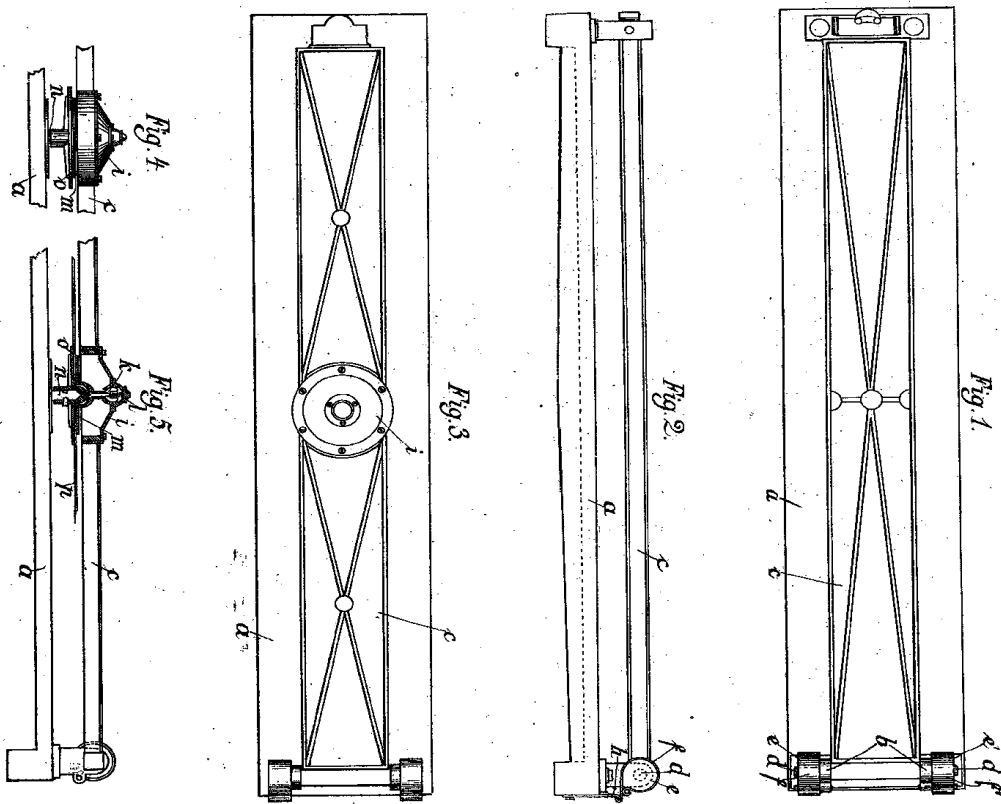
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base plate provided on the vertical or main shaft of the instrument to support the note-disc so as to allow the rotary disc to press the central portion of the note-disc towards the base plate; and a series of pairs of rolls arranged at each end of the bottom plate and of the holder and at the free ends of branches projecting from the bottom plate; and a lever arrangement for operating the rolls 5 by means of the holder in order to displace them in vertical and in radial directions, respectively, in accordance with and in dependence on the movement of the holder, substantially as described.

o Dated this 23rd day of December 1899.

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Agents for the Applicant.

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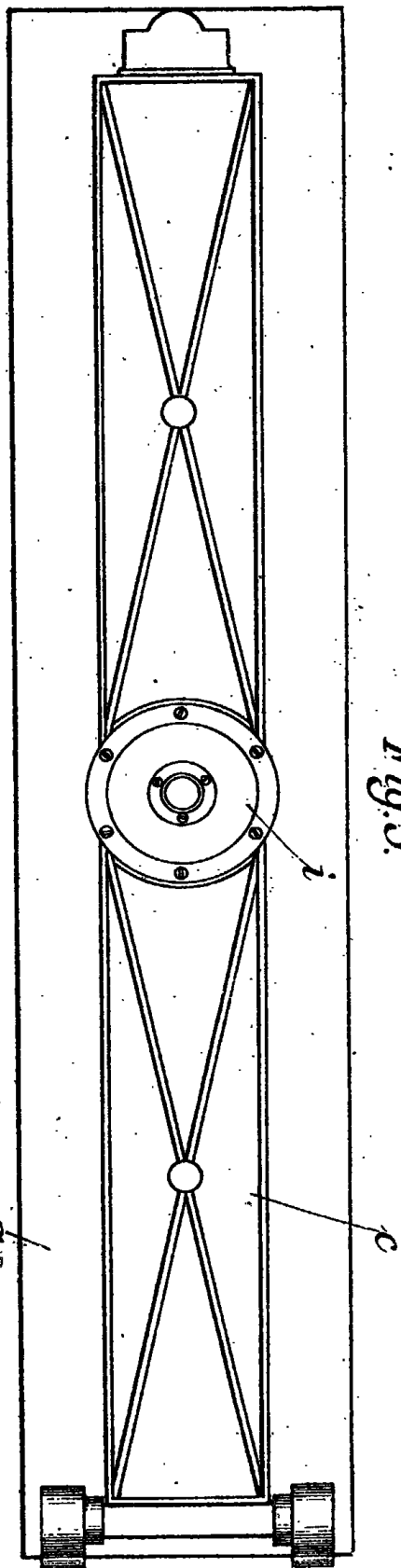


Fig. 3.

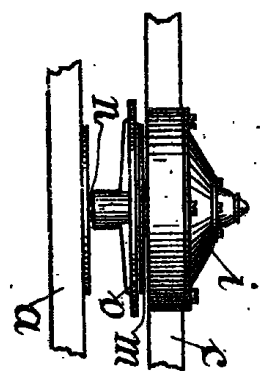


Fig. 4.

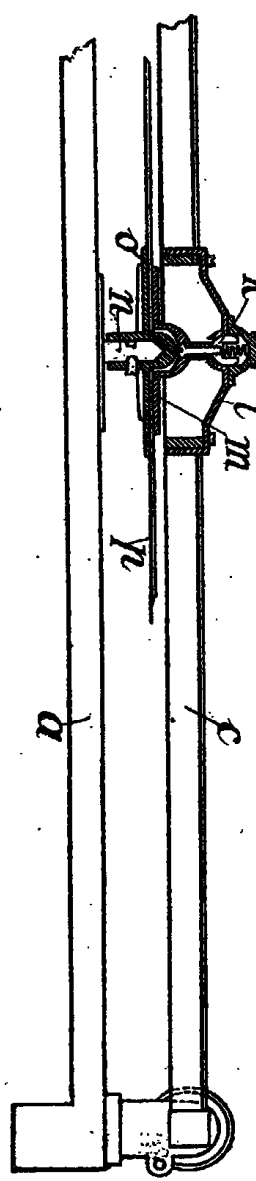


Fig. 5.

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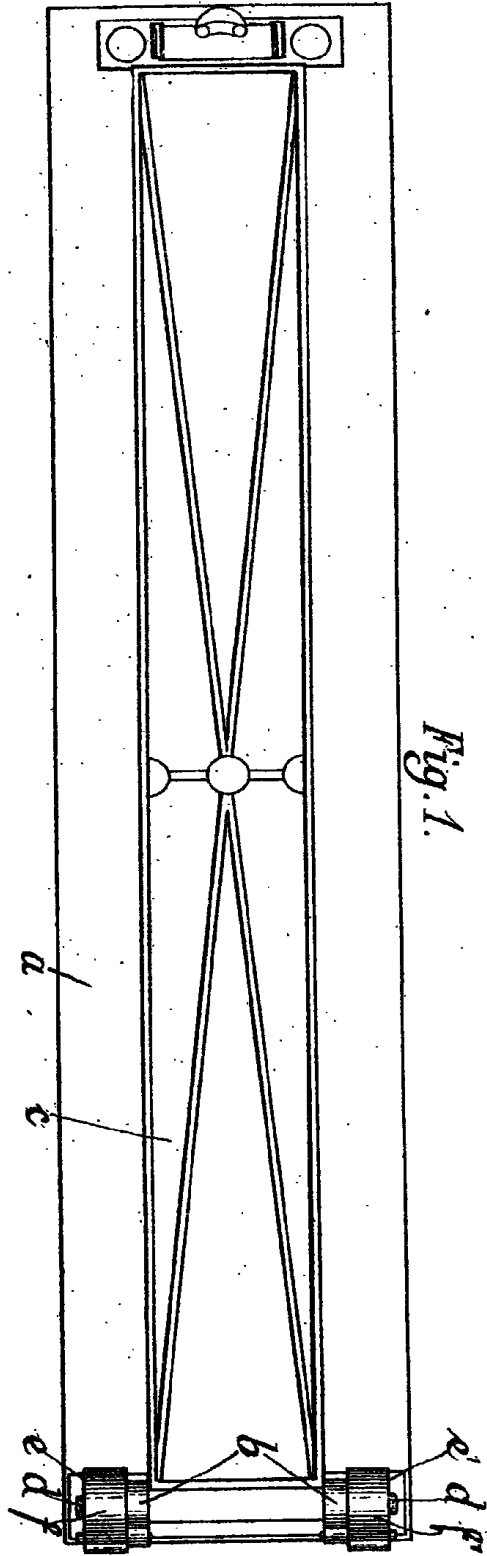


Fig. 1.

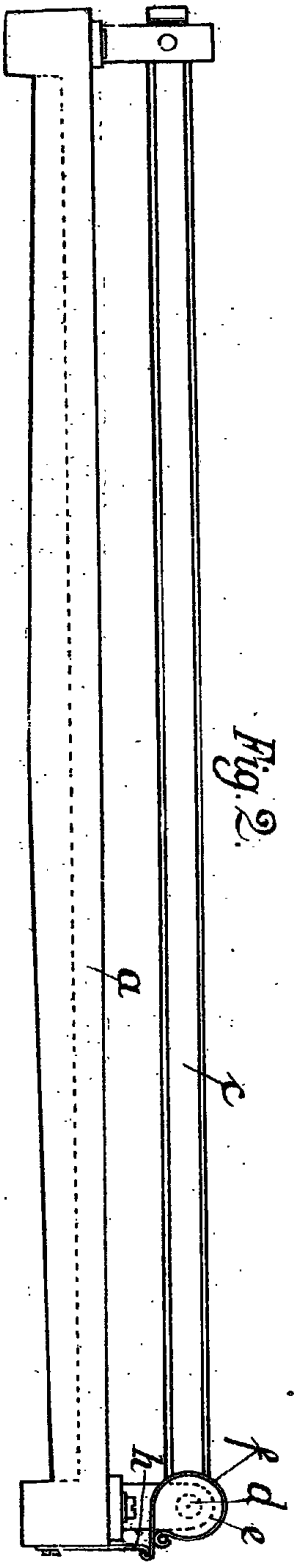


Fig. 2.



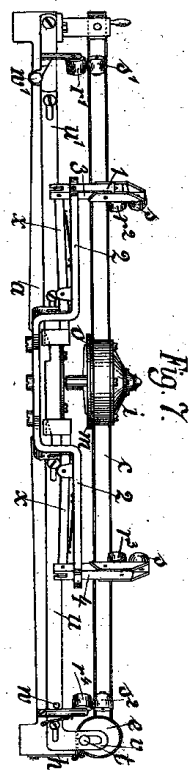


Fig. 7.

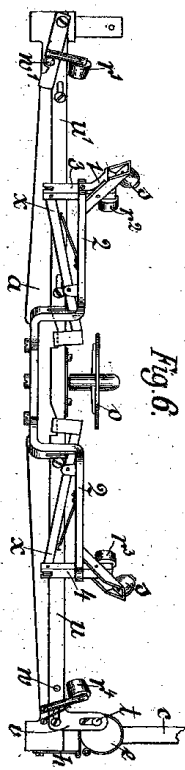


Fig. 6.

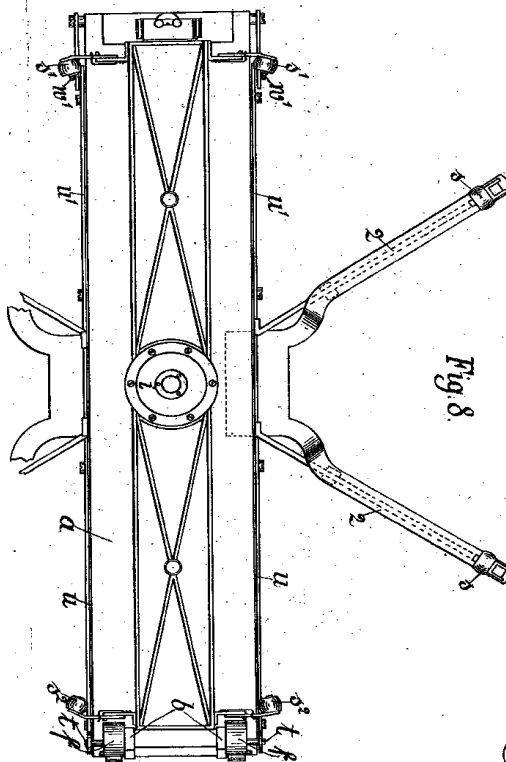


Fig. 8.

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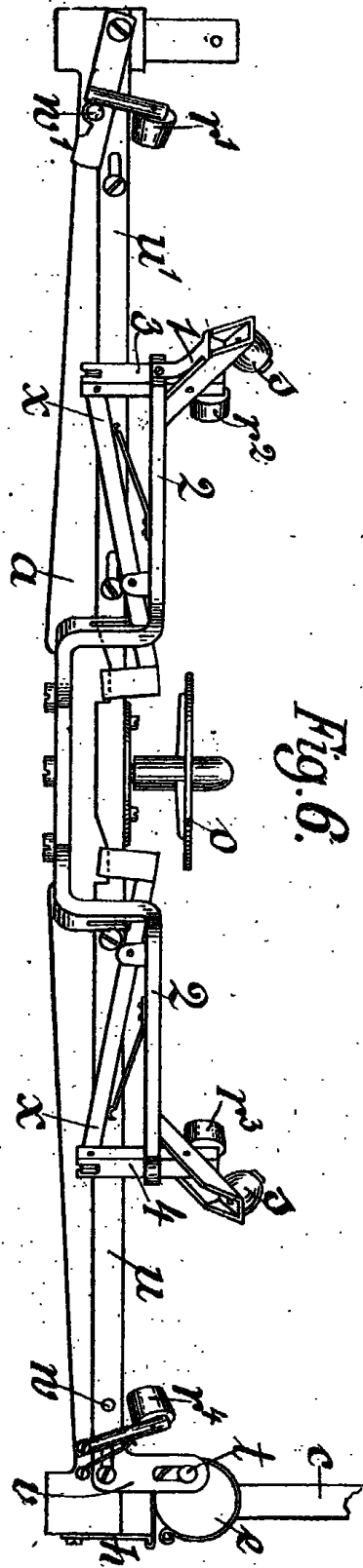


Fig. 6.

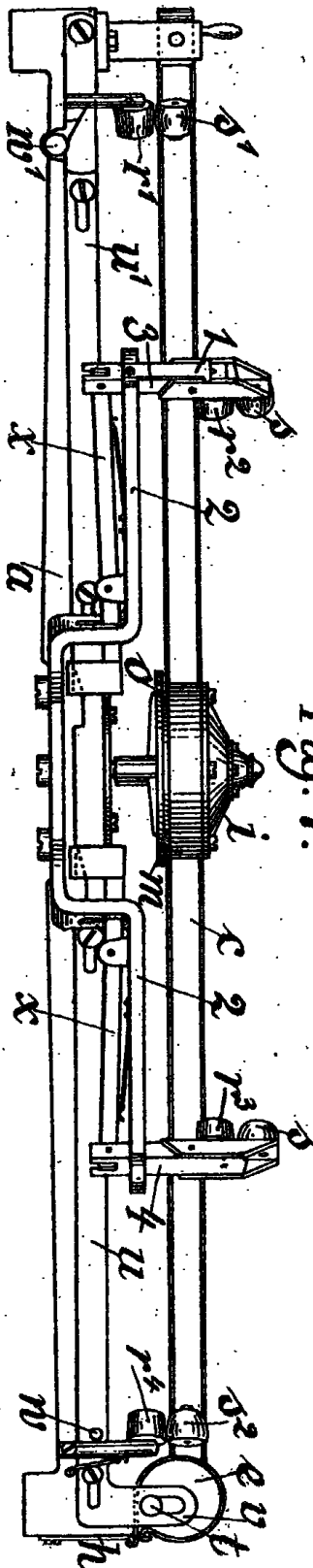


Fig. 7.

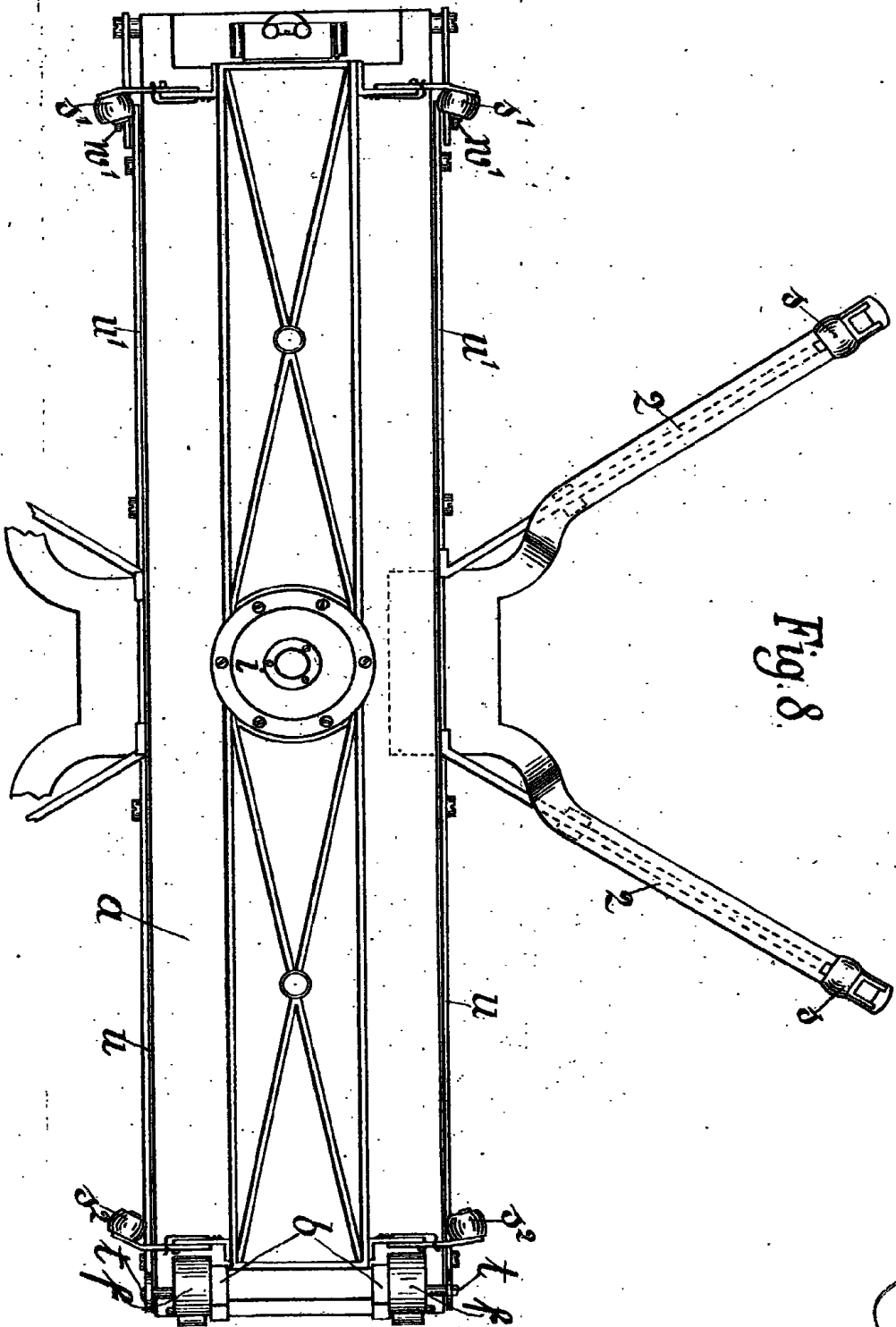


Fig. 8.

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