(No Model.)

4 Sheets—Sheet 1.

R. W. PAIN.

MECHANICAL MUSICAL INSTRUMENT.

No. 601,163. Patented Mar. 22, 1898.

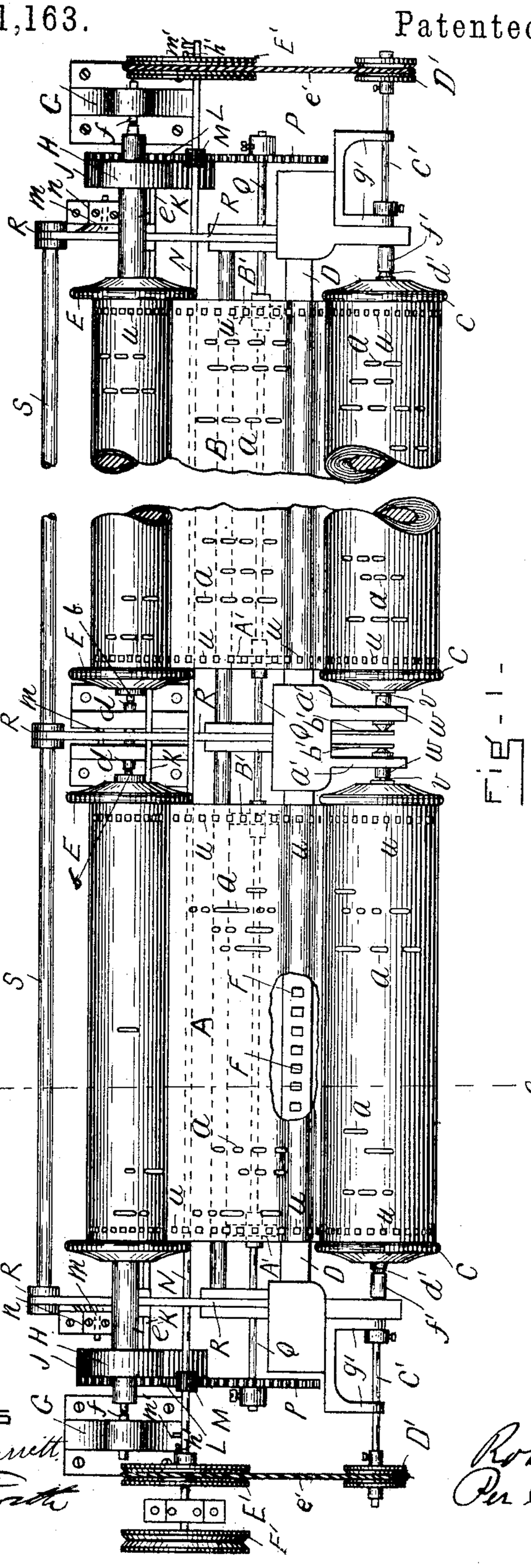

Fig. 1.

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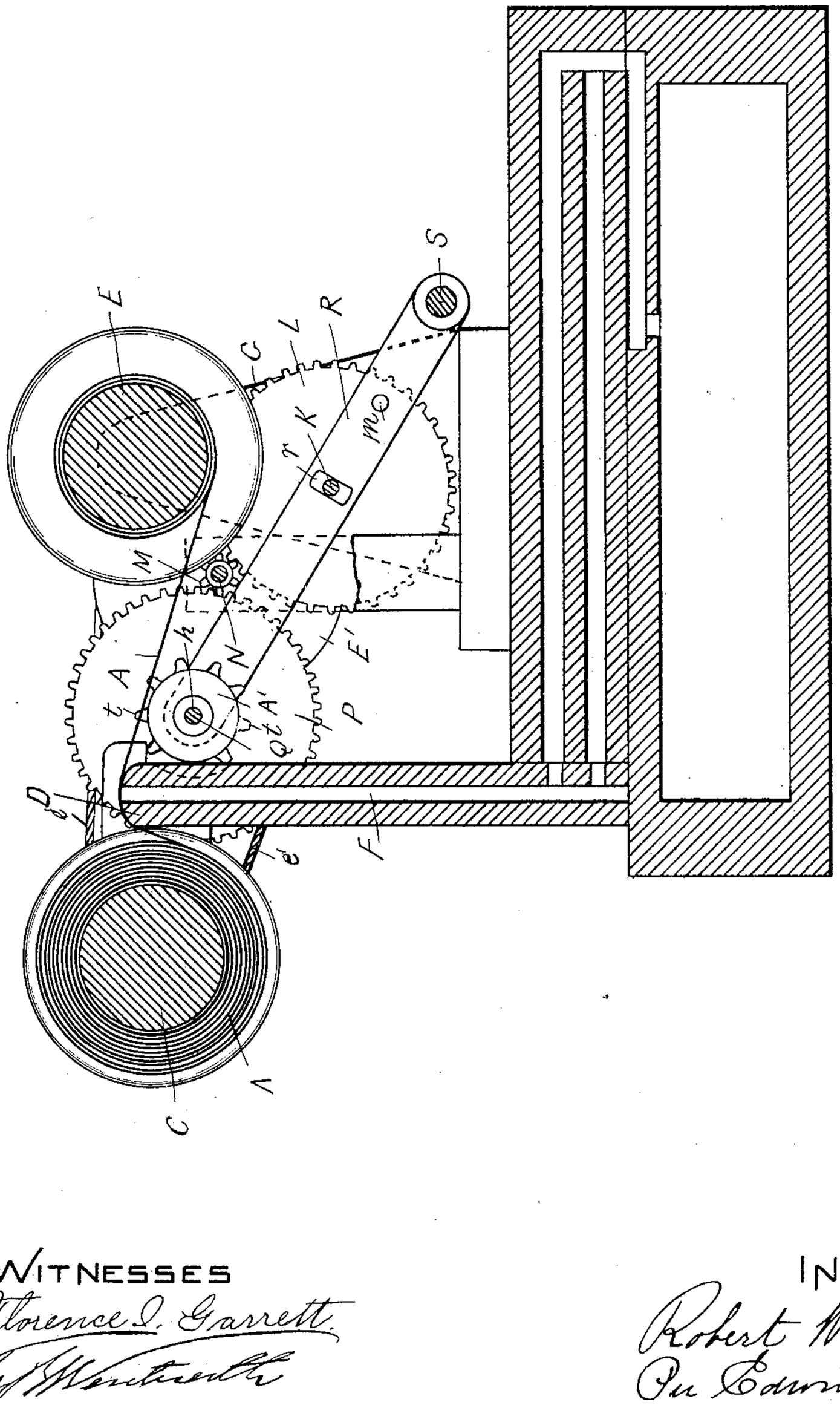

Fig. 2.

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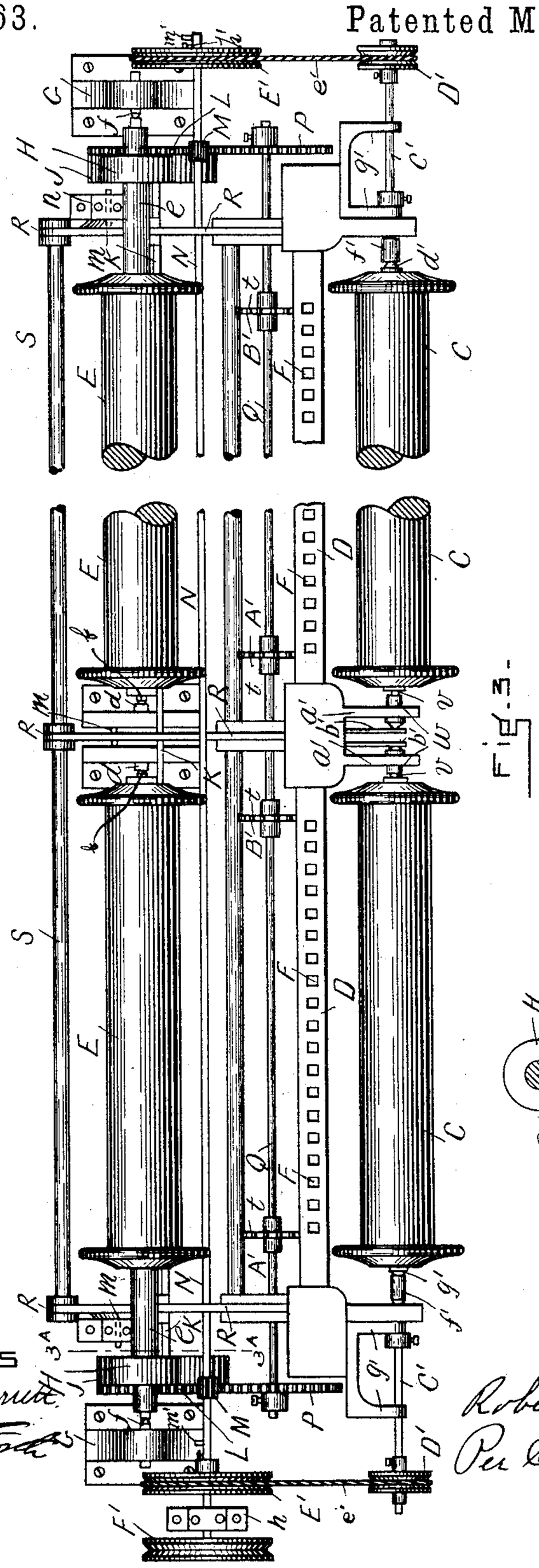

Fig. 3.

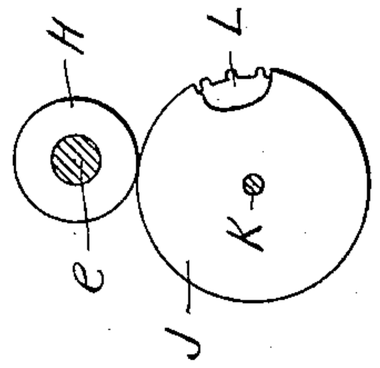

Fig. 3A.

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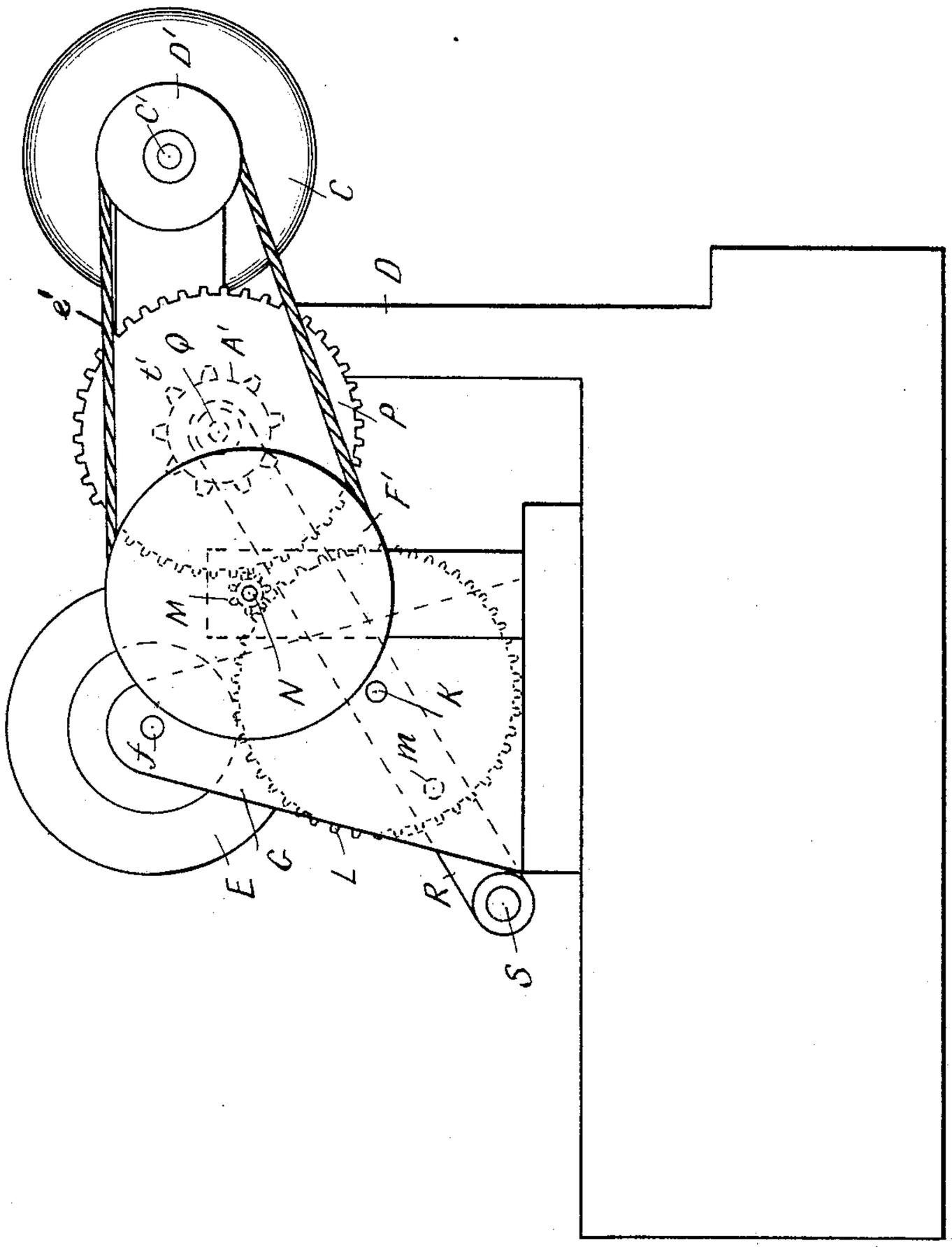

Fig. 4.

WITNESSES

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UNITED STATES PATENT OFFICE.

ROBERT W. PAIN, OF NEW YORK, N. Y., ASSIGNOR TO THE ÆOLIAN COMPANY, OF MERIDEN, CONNECTICUT.

MECHANICAL MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 601,163, dated March 22, 1898.

Application filed April 14, 1897. Serial No. 632,167. (No model.)

To all whom it may concern:

Be it known that I, ROBERT W. PAIN, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Mechanical Musical Instruments, of which the following is a full, clear, and exact description.

This invention relates to mechanical musical instruments in which two or more organs or bank-organs or other musical instruments are operated together and each controlled and operated by a separate or independent perforated music-sheet, the means for controlling the movement of each of the perforated music-sheets being so constructed and arranged for operation that the two or more perforated music-sheets are caused to travel together or in the same time over their respective raceways or tracker-ranges, so that the two or more organs or other musical instruments will be played synchronously or together or in unison as to time; and the invention consists in the novel construction and combination of parts hereinafter described, and set forth in the claims, reference being had to the accompanying sheets of drawings, in which is illustrated the present invention in combination with two separate and independent musical organs or bank-organs or other musical instruments, each operated by a separate perforated music-sheet, the portion of each instrument especially relating to the sounding devices not being shown.

Each music-sheet is first wound upon its separate music-roll and its outer end secured to the corresponding take-up roll, and in the operation of the instrument each music-sheet travels over its respective raceway or tracker-range and is wound upon its take-up roll, and when all wound thereon it is unwound therefrom onto the music-roll again and detached from the take-up roll, when the music-roll, with the music-sheet, is removed from the instrument and another placed therein for the playing of another tune, substantially as usual in mechanical musical instruments except as to the present invention.

In the drawings, Figure 1 is a plan view of two sets or systems of music and take-up rolls of a mechanical musical instrument, each set having an independent perforated music-sheet, with this invention applied thereto for the operation of the two music-sheets, so that they will travel uniformly together and the music performed and represented by the two perforated music-sheets will be played by two organs or other musical instruments synchronously or together. Fig. 2 is a cross-section on line 2 2, Fig. 1. Fig. 3 is a plan view similar to Fig. 1, but with the perforated music-sheets removed. Fig. 3^A is a detail cross-section on line 3^A, Fig. 3; and Fig. 4 is an end view.

In the drawings, A represents a perforated music-sheet in one set or system and B the perforated music-sheet in the other set or system, each having perforations *a* and each secured to a separate music or delivering roll C and adapted to travel over a separate tracker-range or raceway D and to be wound upon a separate take-up roll E in the operation of the instrument, each raceway having a longitudinal row or series of air ducts or passages F, the passing of air through which when connected to the musical part of the instrument causes the reeds or pipes or other sounding devices connected therewith to sound, all substantially as usual in mechanical musical instruments and needing no more particular description herein.

In the drawings the music-sheet, its music-roll, and take-up roll in one set are shown as broken apart.

Each take-up roll E turns by its journal-pin *b* in one end in a socket in a pin *d*, secured in the framework, and by its journal or shaft *e* at its other end in a socket in a center-pin *f* in an upright support G of the framework, each independent of the other. On the shaft *e* of the take-up roll is a friction-pulley H, which bears against a friction-pulley J on a shaft K, turning in bearings in the upright G of the framework, and on this shaft K is a gear L, which engages with a pinion-gear M on the driving-shaft N, turning in supports *h*, and this pinion-gear engages with a gear P on a shaft Q, extending parallel with the driving-shaft, between the music and take-up rolls, the length of the two sets of rolls back of the raceway-board D and under the music-

sheet when in position for operation in the instrument, the shaft Q being adapted to turn in bearings in the ends of three transverse arms R below the take-up roll and pivoted at *m* to supports *n* of the framework, their ends extending back and connected together by a long rod S, as shown in Figs. 1 and 3.

The shaft Q has secured to it four wheels A′ B′, having teeth *t*, making sprocket-wheels, and they are so located on the shaft for each two, A′ B′, to be under a separate perforated music-sheet, a short distance back from its edge on each side, and engage with a longitudinal row of perforations *u*, extending along the length of the music-sheet at or near each edge, as shown in Fig. 1, so that the teeth of the wheels will project up into the perforations in each row for purposes to be described.

The shaft K extends through slots *r* in the cross-arms R, which slots allow sufficient movement up and down of the arms for the sprocket-wheels A′ B′ to be moved up and down to respectively engage with their respective rows of perforations *u* in the perforated music-sheets and to disengage therefrom, as desired.

By the gear connection of the sprocket-wheel shaft and the driving-shaft the sprocket-wheels are driven at a uniform rate of movement, and as they engage with their respective perforated music-sheets, as described, the perforated music-sheets are pulled or drawn over the raceways in exactly the same time or together, so that both sheets will travel in unison and continuously so for the music represented on the two music-sheets to be played synchronously or together.

The sprocket-wheels act upon the music-sheets to draw them over their respective raceways; but to take up the slack of the sheets after they leave the wheels the take-up rolls E, by their friction-pulleys H, connecting with the driving-shaft friction-pulleys J, are caused to travel at a speed relatively to the travel of the sprocket-wheels so that they will all coöperate, the take-up rolls acting upon the music-sheets to relieve some of the strain of the sprocket-wheels upon them, but not to interfere with the control by the sprocket-wheels of the music-sheets over the raceways for the uniform travel of both thereover for the playing of the two instruments in unison with each other.

The journal *v* at one end of each music-roll C is arranged to turn in a socket in a cylindrical block *w*, freely disposed in an opening-arm *a′* of the frame, and arranged to bear against the outer end of the block is a flat spring *b′*. The other journals *d′* of the rolls are arranged to turn in sockets in heads *f′* of shafts C′, adapted to turn in bracket-arms *g′* of the framework, each shaft having a pulley D′ on its outer end.

Each pulley D′ is connected by a belt *e′* with a loose pulley E′ on the main driving-shaft G. These pulleys E′ are arranged to be moved along the shaft a short distance for a side pin *h′*, secured to each pulley, to be in the line of movement of a radial pin *m′* on the driving-shaft N, so that when the pulleys are moved for their respective pins *h′* to be in such line the driving-shaft N, being also moved to the left, Figs. 1 and 2, disengages its gear M from the music-roll gears P and take-up-roll gears L, the pulleys will be operated, and thus the music-rolls turned to rewind upon each music-roll its music-sheet after it has played the tune. The pulleys, when the instruments are being operated, are moved back and out of engagement with their shaft to not interfere with the movements of the music-rolls.

When desirous of rewinding the music-sheets upon their respective rolls, the sprocket-wheels are moved downward and disengaged from their respective music-sheets by taking hold of the connecting bar or rod S and swinging upward the arms R, which lowers the inner ends of the arms with their sprocket-wheels, disengaging them from their perforated music-sheets, leaving the music-sheets free to be rewound upon the music-rolls, and when another music-sheet has been put in place the sprocket-wheels are raised to make their engagement with the music-sheets, so they will be operated by the sprocket-wheels uniformly, as before. Thus by the uniform movement of all the sprocket-wheels the two perforated music-sheets will be made to travel synchronously or together or in the same time, so that the music arranged upon the music-sheets will be played by the two instruments in unison so far as time is concerned.

More than two perforated sheets can be arranged and operated together, as described for the two, by extending and duplicating the operating parts.

Connected to the driving-shaft N is a pulley F′, which is adapted to be connected by a belt to any suitable motive power.

The shafts have their respective gears and pulleys duplicated at each end for the operation of both sets of music-rolls.

Having thus described my invention, what I claim is—

1. The combination with a plurality of mechanical musical instruments arranged side by side, of a plurality of perforated music-sheets, one for each instrument, each provided near its opposite edges with longitudinal rows of perforations, a rotary shaft arranged transversely to the music-sheets and journaled in movable bearings, sprocket-wheels on said shaft arranged to normally engage the longitudinal rows of perforations in the music-sheets to feed the latter synchronously, and means for shifting said shaft for throwing the sprocket-wheels out of engagement with the music-sheets, substantially as described.

2. In a mechanical musical instrument, in combination, two or more perforated music-sheets, an independent and separate organ, bank-organ, or other musical instrument to

each music-sheet, longitudinal rows of perforations in each music-sheet, a revolving shaft, arms pivoted to a suitable support carrying said shaft, sprocket-wheels on said shaft, one to each row of perforations adapted to engage therewith to cause the music-sheets to travel together or synchronously.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ROBERT W. PAIN.

Witnesses:
OWEN WARD,
C. R. COMÉS.