

(No Model.)

2 Sheets—Sheet 1.

R. W. PAIN.

MECHANICAL MUSICAL INSTRUMENT.

No. 322,554.

Patented July 21, 1885.

Fig. 1.

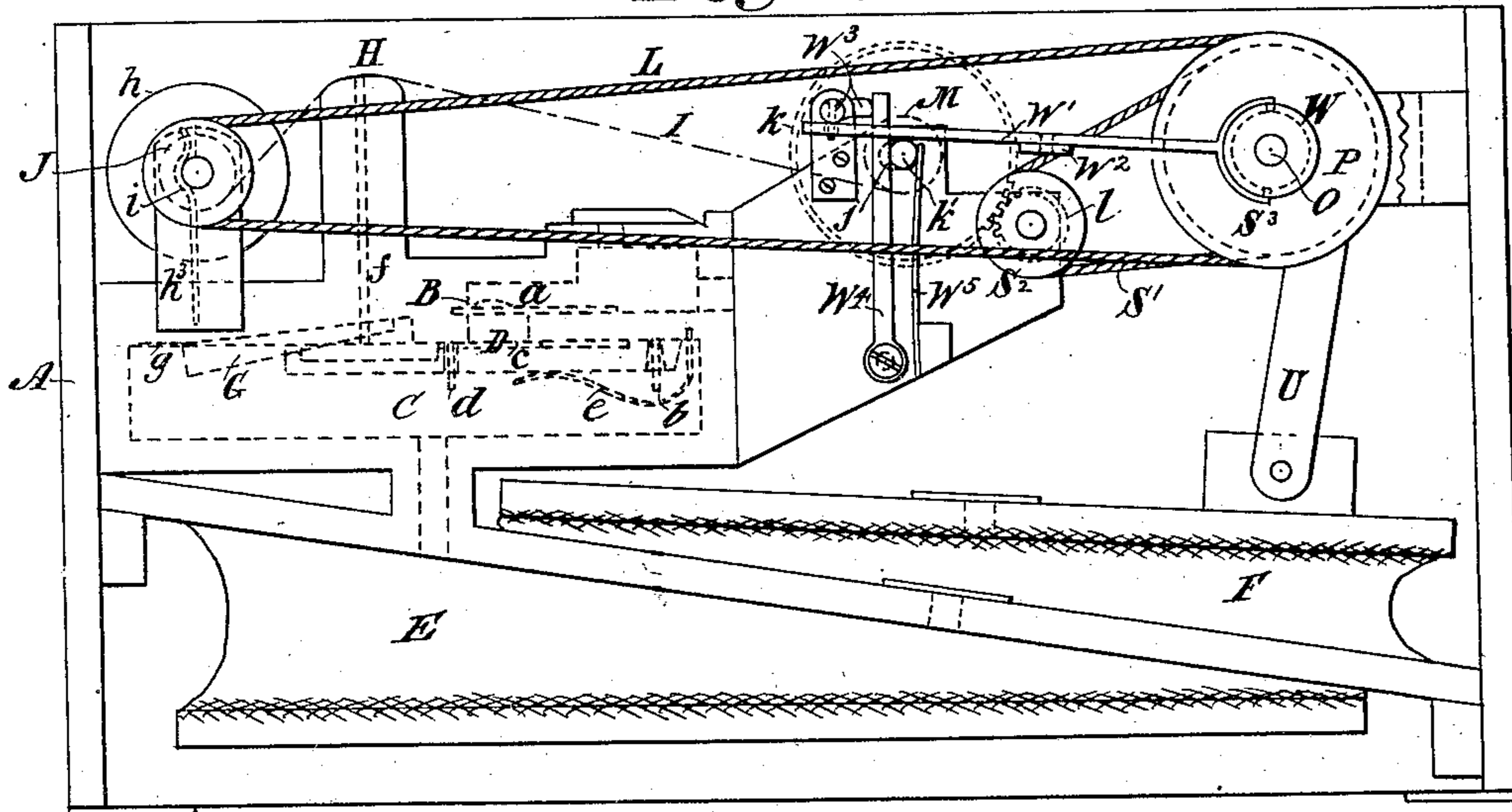
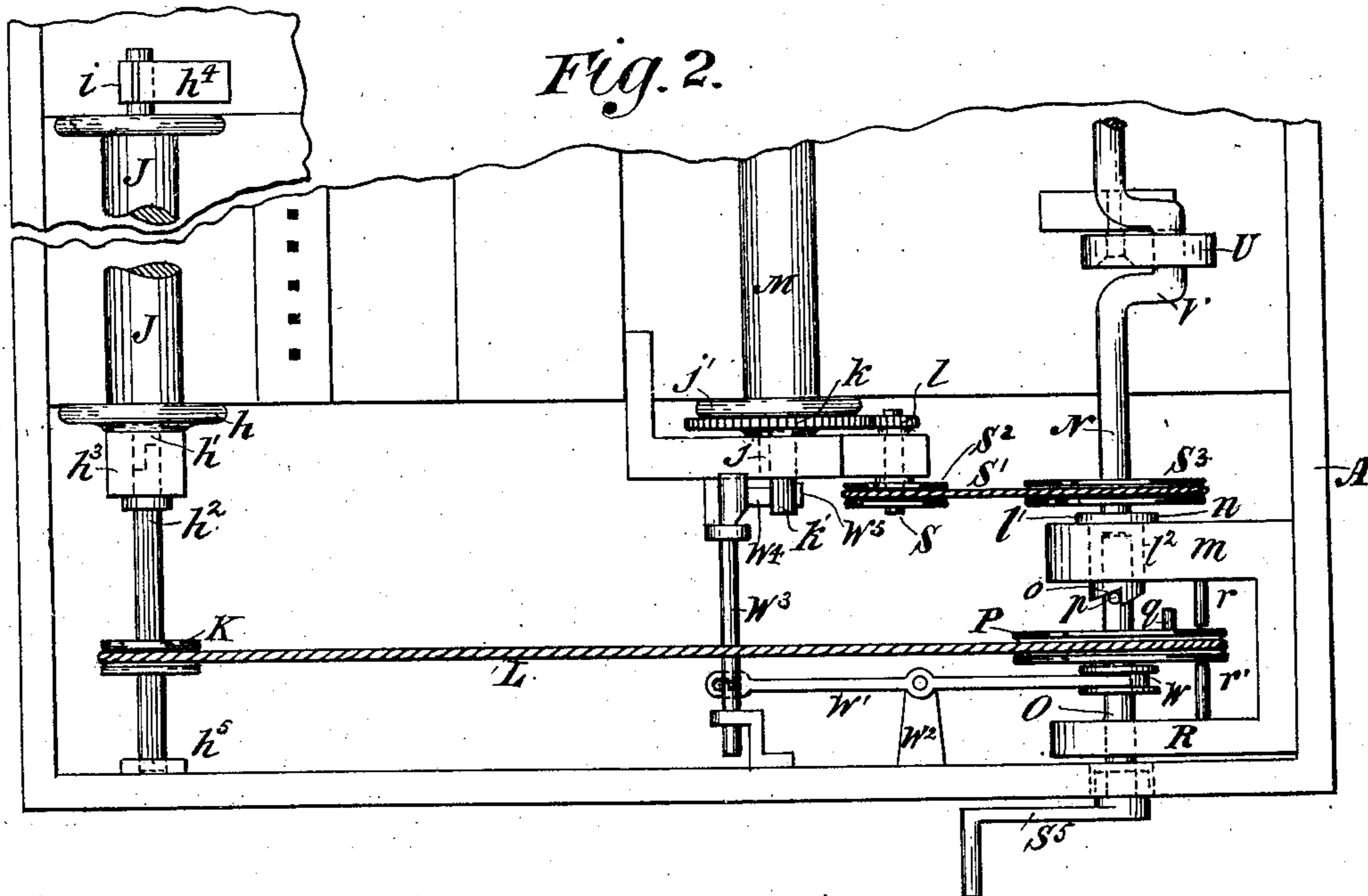


Fig. 2.



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Robert W. Pain,
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2 Sheets—Sheet 2.

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Fig. 3.

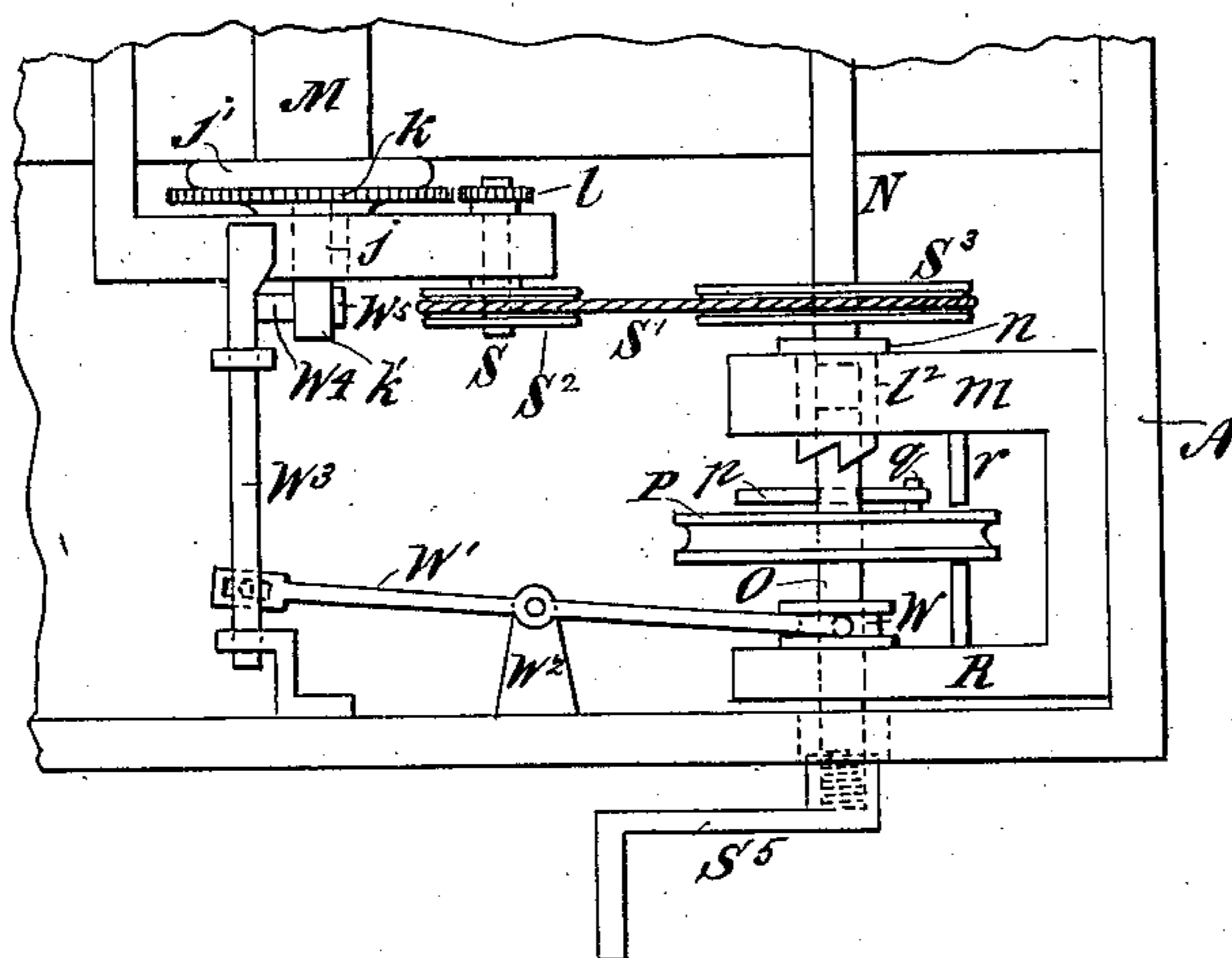
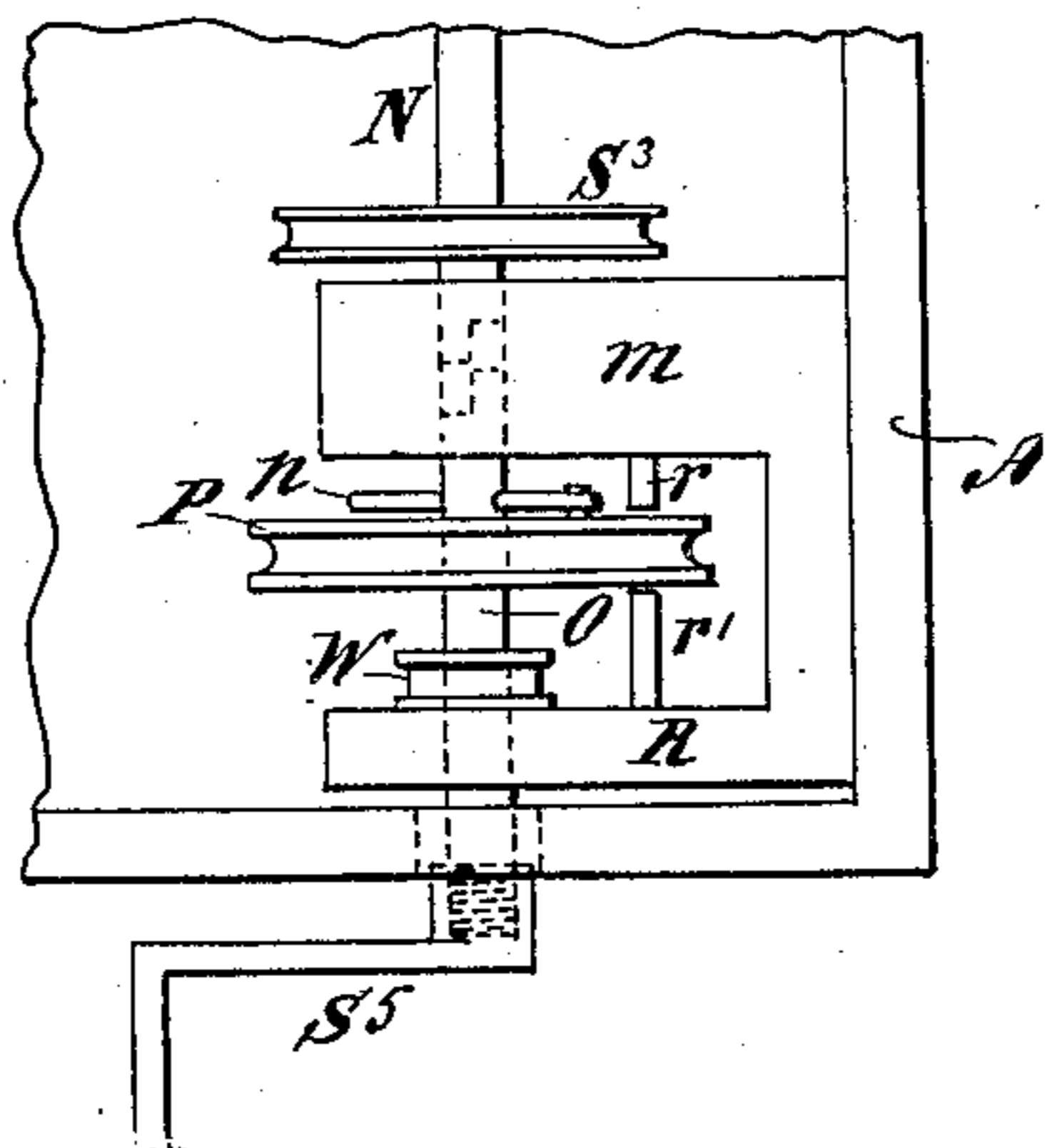


Fig. 4.



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UNITED STATES PATENT OFFICE.

ROBERT W. PAIN, OF NEW YORK, N. Y.

MECHANICAL MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 322,554, dated July 21, 1885.

Application filed October 18, 1884. (No model.)

To all whom it may concern:

Be it known that I, ROBERT W. PAIN, of New York, in the county and State of New York, have invented a certain new and useful
5 Improvement in Mechanical Musical Instruments, of which the following is a specification.

The improvement consists in novel means for rewinding the music-sheet from the take-up roller to the music-roller.

10 I will describe a musical instrument embodying my improvement and then point out the improvement in claims.

In the accompanying drawings, Figure 1 is a side view of a mechanical musical instrument
15 embodying my improvement, having one side of the case removed. Fig. 2 is a plan of a portion thereof. Fig. 3 is a plan of a portion of the same with certain parts in another position; and Fig. 4 is a plan view of a portion
20 thereof, illustrating a modification.

Similar letters of reference designate corresponding parts in all the figures.

A designates the case of the instrument. It may be made in any suitable manner.

25 B designates one of a series of sound-producing devices, here shown in dotted lines. Said devices consist of reeds arranged in cells

a. The cells a communicate with a wind-chest, C, under control of valves D. The wind-chest
30 communicates with an equalizer, E, with which are combined bellows F. The bellows F may be of any suitable construction. As here shown they are suction-bellows. The equalizer E is, as usual, of bellows-like construction.

35 The valves D of the reed-cells are arranged in the wind-chest C. Each valve consists of a lever, which may be made of wood or analogous material, provided with a face of sheep-skin or like substance, c, and fulcrumed near
40 one end to a pin, b. It is preferably guided in its movements by a pin, d, extending through it. A spring, e, holds it normally in position to cut off communication between the reed-cell and the wind-chest. Each valve D ex-

45 tends over a pneumatic motor, G, arranged in line with it in the wind-chest. The pneumatic motor consists of a strip of wood or like material fastened by a flexible material to the upper wall of the wind-chest. At one end the
50 strip of wood of the motor is fastened close

to the wind-chest. The motor is similar to an ordinary organ-bellows, only very much smaller. Its strip of wood swings on one end, and hence is similar to a lever fulcrumed at one end. The valve D extends well over the
55 strip of wood comprising the motor. From the pneumatic motor ducts f extend to the apex of a rest, H. A perforated music-sheet, I, travels over this rest H and controls the passage of air to the interior of the motors. When
60 air is admitted to a pneumatic motor, the latter is expanded, and it then opens the valve D with which it acts. The passage of air from the motor to the wind-chest is controlled by an opening, g.

65 J designates a music-roller, upon which the music-sheet I is wound preparatory to playing. A flange, h, on the music-roller J serves to retain the music-sheet in place on the roller. The journal h' of the music-roller extends for
70 some distance beyond the music-roller, and its outer end is preferably shouldered to engage with a corresponding shoulder on the outwardly-extending end of a shaft, h², on a pulley, K. Said engagement is effected within
75 bearings in a standard, h³, on a fixed portion of the instrument. By this means a clutch-connection is effected between the music-roller and the pulley K. I may, however, use any other suitable form of clutch. The
80 outer end of the shaft h² may be supported in a bearing, h⁴, secured to the side of the casing.

I have shown a spring, i, on the standard h⁴ by which the music-roller is secured in
85 place. By moving said spring outward the music-roller may be readily removed and inserted.

The pulley K is provided with a peripheral groove adapted to receive an endless
90 band, L.

M designates the take-up roller of the instrument. Said take-up roller is journaled in a bearing, j, which may be located in a bracket extending from the wind-chest of the instrument, and may be secured to it by screws or
95 otherwise. A bearing (not shown in the drawings) supports the other end of the roller M. The bearing j is elongated horizontally so that the roller M may be moved toward and away
100 from the shaft N.

Flanges j' on the ends of the take-up roller serve to retain the music-sheet in its proper position on said roller. Contiguous to said flange j' I have arranged a gear-wheel, k , upon the journal k' of the take-up roller. Said gear-wheel is fast on said journal, and meshes with a gear-wheel or pinion, l , mounted on a shaft, S , which, as shown, is journaled in the same bracket as that in which the bearing j is arranged. A belt, S' , passes around a pulley, S^2 , affixed to the said shaft S , and also around a pulley, S^3 , mounted on a shaft, N . The shaft N has at the end which is the nearer to the pulley S^3 a sleeve, l' . The outer portion of said sleeve extends into and through a bearing, l'' , in a bracket, m , affixed to the case A of the instrument. Thus the sleeve supports one end of the shaft N . A collar, n , on said sleeve serves to prevent movement of the shaft endwise in one direction. In the outer end of said sleeve is a notch, o . The notch o is adapted to receive a pin, p , upon a shaft, O . The pin p extends through the shaft O in a direction at right angles to the axis of said shaft, and protrudes for a considerable distance upon each side of the shaft; but I may use two pins, one upon each side of the shaft, if desired. The pin may be engaged with and disengaged from the notch of the sleeve by moving the shaft O longitudinally. When said pin has been moved into the notch o , it operates to form a clutch, whereby motion may be transmitted from the shaft O to the shaft N . The inner end of the shaft O is adapted to fit loosely in the outwardly-extending portion of the sleeve l' .

Obviously I may dispense with the sleeve l' , and in lieu thereof extend the driving-shaft N into the bearing l'' in the bracket m . In that event the form of the clutch may be varied—for instance, as shown in Fig. 4 of the drawings.

Mounted loosely upon the shaft O is a pulley, P . Upon the inner side of said pulley are arranged pins q . These pins are arranged in such position upon the pulley P that they will engage with the outwardly-extending ends of the pin p when the latter shall have been moved out of the notch o . The pulley P is grooved upon its periphery to receive the endless band L . Pins r r' on the bracket m and a bracket, R , extending from the case, prevent the pulley P being carried in the direction of the length of the shaft O when the shaft O is shifted longitudinally, and thereby prevent the pins q q' from coming into engagement with the pin p when the latter is in engagement with the notch o . The outwardly-extending portion of the shaft O is journaled in bearings in the bracket R , affixed to the case of the instrument. The end of the said shaft is adapted to receive a crank, S^5 . As here shown, engagement is effected between said crank and shaft by means of screw-threads.

U is a link which is at one end pivotally connected to the bellows F , and has its other end in engagement with a crank, V , on the driving-

shaft. By this means the bellows may be operated.

On the shaft O a grooved collar, W , is affixed. A lever, W' , fulcrumed to a bracket, W^2 , (shown as affixed to the case of the instrument,) has one end forked to embrace the collar W , and carries pins at such end, which engage with the groove of the pulley without interfering with its rotation. When the shaft O is moved longitudinally, this lever will therefore be rocked. The other end of the lever is connected to a cam-slide, W^3 , which, when the lever is rocked, acts upon and shifts a lever, W^4 , which impinges against the journal k' of the roller M . A spring, W^5 , bears against the opposite portion of the journal k' . When the shaft O is moved outward, the lever W' will be so rocked as to shift the cam-slide inward. The cam-slide will then release the lever W^4 , and the spring W^5 will force the roller M horizontally in such direction that the gear-wheel k will be separated from the pinion l . When the shaft O is moved inward, the lever W' will be rocked so as to shift the cam-slide in such direction that it will actuate the lever W^4 to shift the roller M , so that the gear-wheel k will engage with the pinion l .

When the instrument is to be operated, the pin p is brought into engagement with the notch o in the sleeve l' by moving the shaft O inward, as before explained. The crank S^5 may then be operated to rotate the shaft O and cause the music-sheet to be wound upon the take-up roller. The shaft N will then also be operated. When, upon the contrary, it is desired to rewind the music-sheet upon the music-roller, the shaft O is moved outwardly until the pin p is free from engagement with the slot o . If, then, the shaft O be rotated, the pin p will be brought into engagement with the pins q q' on the pulley P , the latter will be caused to rotate; motion will be conveyed by means of the endless band L to the pulley K , the music-roller J is caused to rotate, and the music-sheet is thus rewound upon said music-roller. During this operation no motion will be imparted to the shaft N ; hence the bellows will remain idle.

It will be observed that the shaft O may be moved freely through the pulley P , and that the said shaft O is always rotated in the same direction either to wind or rewind the music-sheet.

I do not limit myself to the particular form of clutch shown, nor to the identical means for operating the pulley P , as the same may obviously be varied. I may omit the collar W , lever W' , and cam-slide W^3 , and shift the lever W^4 by hand to move the roller M . Then means will be used to retain the lever W^4 in position, or this lever will be so constructed as to remain in any position into which it may be adjusted.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a mechanical musical instrument, the

combination of a music-roller, a take-up roller, a music-sheet, a driving-shaft whereby motion is conveyed to said take-up roller, an auxiliary shaft adapted to be engaged with and disengaged from the driving-shaft, and a pulley mounted loosely upon the auxiliary shaft, adapted to be engaged with and disengaged from the auxiliary shaft, substantially as specified.

10 2. In a mechanical musical instrument, the combination of a music-roller, a music-sheet, a take-up roller, a driving-shaft for imparting motion to said take-up roller, an auxiliary shaft adapted to be engaged with and
15 disengaged from the driving-shaft, a pulley mounted on said auxiliary shaft, a pulley on the music-roller, a driving-belt, and a crank, substantially as specified, whereby when the auxiliary shaft is in engagement with the driving-shaft the crank may be rotated to unwind
20 the music-sheet from the music-roller, and when the auxiliary shaft is out of engagement with the driving-shaft the crank may be rotated in the same direction to rewind the music-sheet on the music-roller.
25

3. The combination of a roller, J, a roller, M, a driving-shaft for imparting motion to the roller M, a sleeve, V, on the driving-shaft having the notch o, a shaft, O, provided with a pin, p, a pulley, P, provided with pins q q',
30 an endless belt, L, and a pulley, K, substantially as specified.

4. In a mechanical musical instrument, the combination of a music-roller, a take-up roller, a shaft for imparting motion to said take-up roller and operating the bellows, and an auxiliary shaft adapted to be engaged with the driving-shaft for the purpose of operating the take-up roller and transmitting motion to the bellows, and disengaged from the bellows-operating shaft for the purpose of releasing the latter and operating the music-roller, substantially as specified.
35
40

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Witnesses:

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