L. W. SOUTHGATE.

DEVICE FOR ADJUSTING THE RELATION BETWEEN MUSIC SHEETS AND TRACKERS.

APPLICATION FILED FEB. 23, 1909.

995,492.

Patented June 20, 1911.

2 SHEETS—SHEET 1.

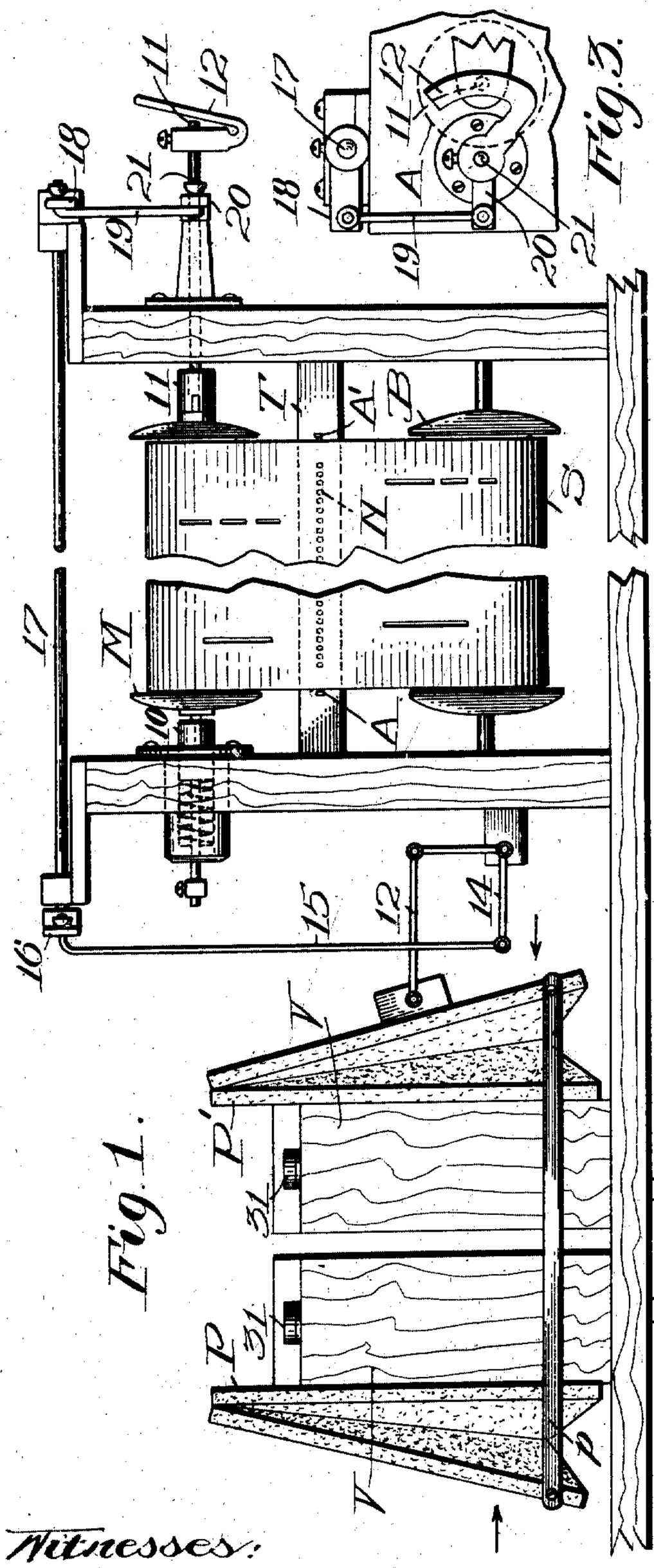

Fig. 1.

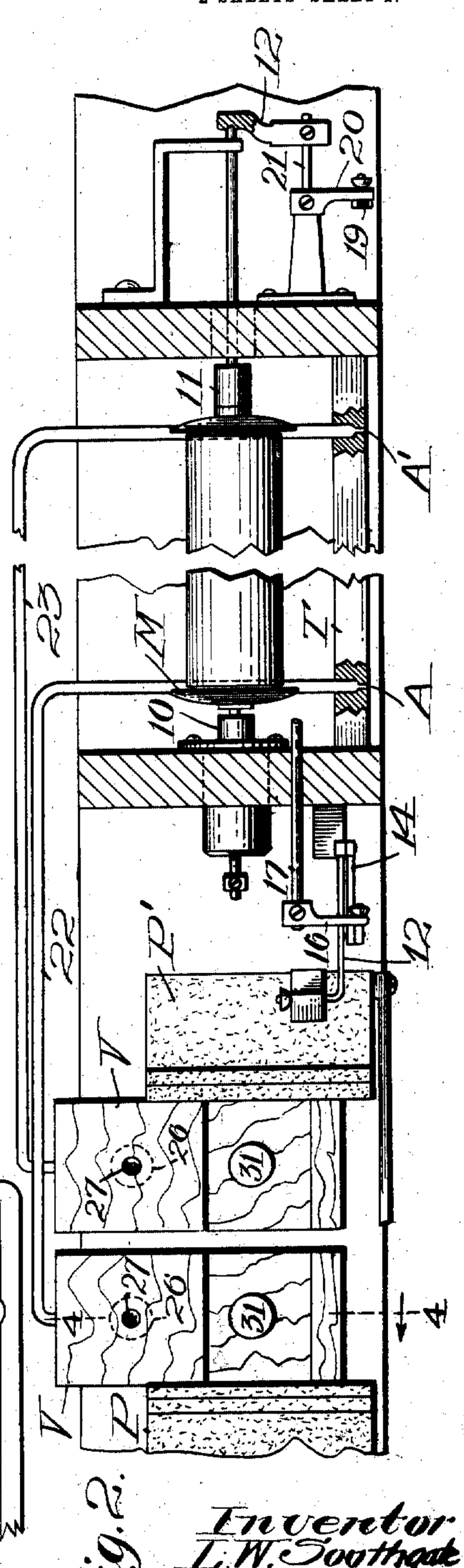

Fig. 2.

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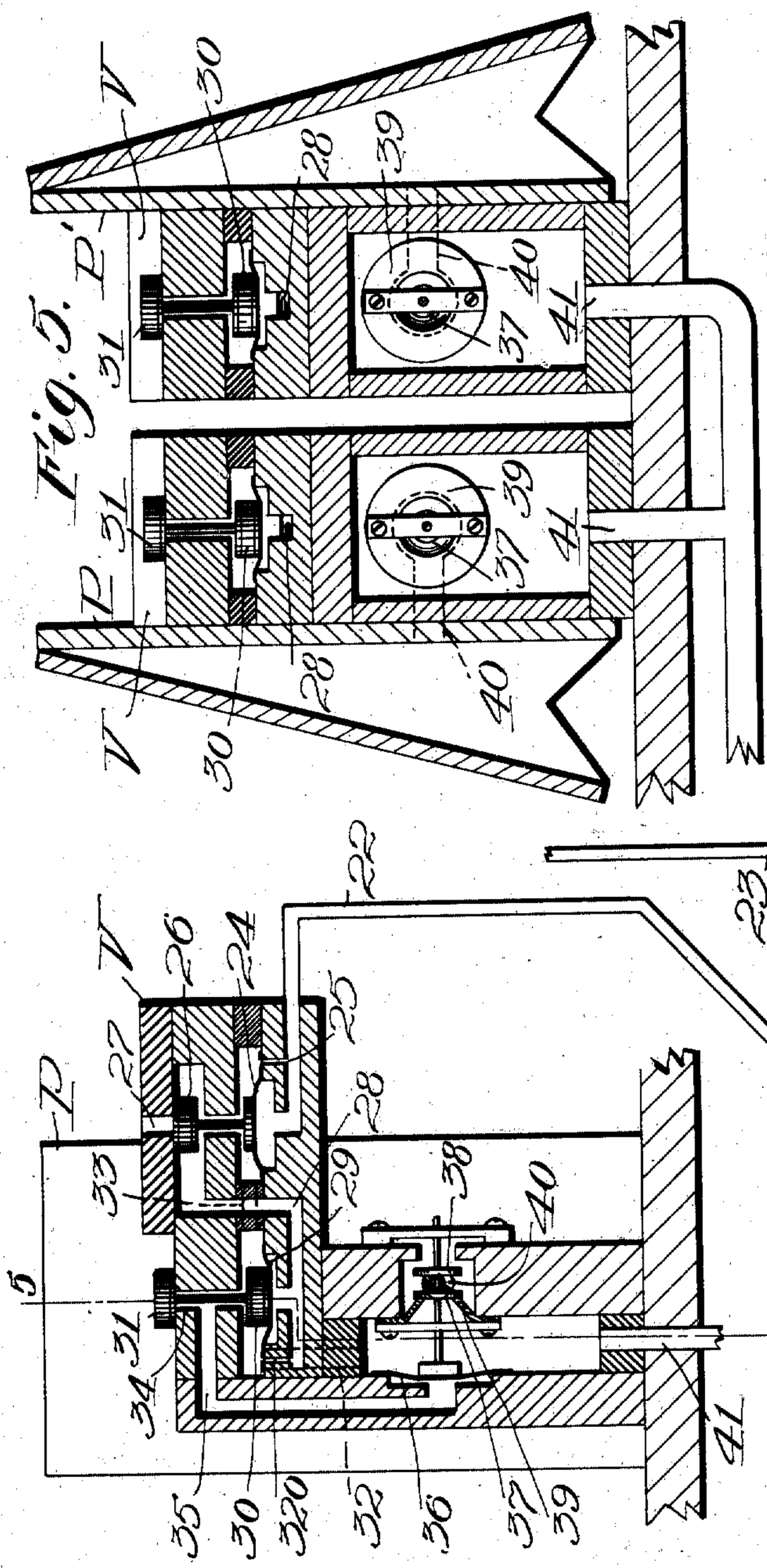

Fig. 5.

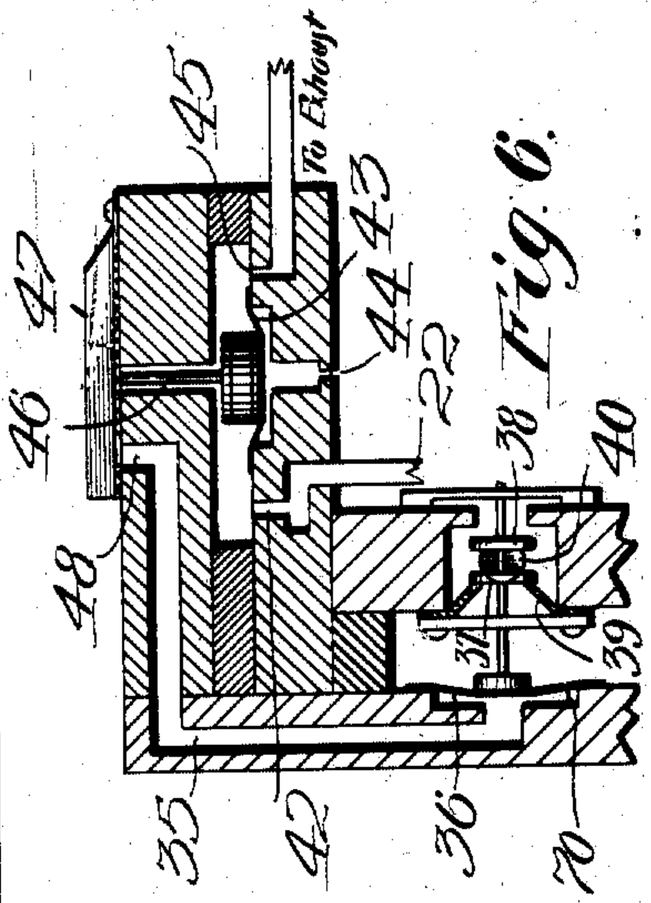

Fig. 6.

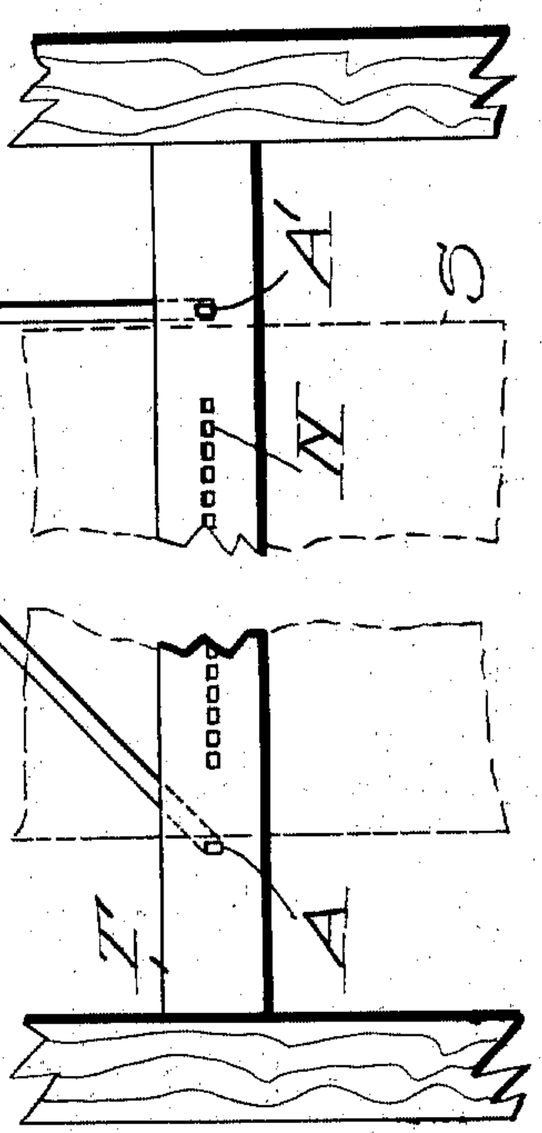

Fig. 4.

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UNITED STATES PATENT OFFICE.

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DEVICE FOR ADJUSTING THE RELATION BETWEEN MUSIC-SHEETS AND TRACKERS.

995,492. Specification of Letters Patent. **Patented June 20, 1911.**

Application filed February 23, 1909. Serial No. 479,417.

To all whom it may concern:

Be it known that I, LOUIS W. SOUTHGATE, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Device for Adjusting the Relation Between Music-Sheets and Trackers, of which the following is a specification.

The object of this invention is to provide a new and improved mechanism for automatically preserving or keeping the music-sheet in an automatic player in proper tracking position on the tracker.

To this end, the invention consists in providing two tracking controlling openings arranged one at each end of the series of note-operating openings outside of the normal track or path of the music-sheet so that both tracking controlling openings will be uncovered when the music-sheet is in normal position on the tracker, and in providing an operating mechanism controlled by said tracking controlling openings for restoring the normal relation between the tracker and music-sheet when the music-sheet moves sidewise out of proper position and covers one of said tracking controlling openings. By this arrangement, it will be noticed that the distance between said two tracking controlling openings is greater than the width of the music-sheet so that imperfections or notches in the edge of the music-sheet normally will not act on the tracking controlling openings, as the music-sheet only acts to bring the operating mechanism into action when the edge of the music-sheet comes over one of the tracking controlling openings. The lateral adjustment between the music-sheet and tracker may be provided for by moving either the tracker or music-sheet and any form of convenient operating mechanism may be employed for making the adjustment.

In the drawings, an arrangement is shown whereby the music-sheet is adjusted by a pneumatically operating mechanism.

Referring to the drawings and in detail, Figure 1 is a front elevation of enough of the parts to illustrate the invention. Fig. 2 is a plan view thereof. Fig. 3 is a side elevation of the adjusting cam. Fig. 4 is a sectional view taken on the line 4—4 of Fig. 2, with the connections extended to the tracker. Fig. 5 is a sectional view taken on the line 5—5 of Fig. 4, and Fig. 6 is a partial sectional view similar to Fig. 4 illustrating a modification.

Referring to the drawings and in detail M designates the music-spool, B the take-up roll, T the tracker, N the note-operating openings in the tracker, and S the music sheet, which parts may be arranged in any of the usual manners common in instruments of this class.

As shown, the left-hand spindle of the music spool is placed in a spring-pressed plunger 10 and the right-hand end which is squared is fitted into the end of a plunger 11 which is arranged to slide in a bearing and in a bracket. The spring-pressed plunger 10 normally tends to move the music spool to the right and the extent of this movement is controlled by the bearing of the sliding plunger 11 on a cam 12, which cam can be turned to force the music spool to the left or turned to allow the music spool to move to the right under the influence of the spring-pressed plunger 10. Thus the cam is employed to move the music spool axially and thus to adjust the position of the music sheet on the tracker.

The cam is operated by two pneumatics P and P′, the movable sides of which are connected together by a link *p*. The right-hand pneumatic is connected to operate the cam by a link 12, bell-crank 14, link 15, lever 16, shaft 17, lever 18, link 19 and lever 20 mounted on the shaft 21 which carries the cam 12. These connections are so arranged that when the left-handed pneumatic P operates or collapses, the cam 12 will be moved to allow the music spool to move to the right under the influence of the spring-pressed plunger 10 and so that when the right-hand pneumatic P′ operates or collapses, the cam 12 will force the music spool M to the left.

A—A′ designate tracking controlling openings which are arranged outside of the normal track of the music sheet so that they both will be uncovered when the music sheet is in normal position on the tracker, as shown in Fig. 1. These tracking controlling openings are shown as arranged in a tracker but they may be arranged at any place just outside of the track of the sheet

and preferably between the music spool and the take-up roll. The tracking controlling openings are connected by passages or tubes 22 and 23 to valve operating mechanisms which control the admission of the exhaust and air into the pneumatics. These valve mechanisms are the same and the one which controls the pneumatic P is detailed in Fig. 4 and the description thereof applies to the other.

Arranged in a valve box V which carries the pneumatic P is a diaphragm 24 under which the passage 22 communicates. A small bleeding passage 25 is arranged from said passage 22 to the upper side of the diaphragm. This diaphragm has exhaust or suction on the upper surface thereof and attached to the same is a valve 26 which normally closes an opening 27 to the air. As the bleeding passage 25 is small, the valve 26 will normally be kept in its raised position so long as the connection 22 opens to the air which condition exists so long as the music sheet does not cover the tracking opening A. The valve 26 controlling the opening 27 is arranged in a compartment which connects by passage 28 to the space under a diaphragm 29 attached to which are valves 30 and 31, which valves remain in the position shown in Fig. 4, so long as the opening A in the tracker remains open and the valve 26 in its raised position. The exhaust is admitted above the diaphragm 29 through a passage-way 32 and a restricted or bleeding passage 320 connects the two sides of diaphragm 29.

The space above the two diaphragms 24 and 29 is connected by a passage 33. So long as the valve 26 remains up, the exhaust acts on both sides of the diaphragm 29 and the valves 30 and 31 remain down. The valve 31 controls an opening 34 which extends to the atmosphere and the valve 30 controls a passage 35 which extends back of a diaphragm 36 to which is attached a double valve 37 and 38, the valve 37 coöperating with a seat 39 and the valve seat 38 with a seat formed in the frame. So long as the exhaust acts at the left of the diaphragm 36, the valve 37 is kept to its seat.

40 designates a passage-way into the pneumatic P.

41 designates an exhaust pipe which is connected to the chambers formed in the two valve boxes.

The operation is as follows,—So long as the opening A is uncovered, the parts remain in the position shown in Fig. 4. When, however, the passage A is closed, the valve 26 will drop admitting air under diaphragm 29 which will raise the same, open valve 31, admit air to the left of the diaphragm 36 and open valve 37 and close valve 38 and thus admit suction into the pneumatic H which will collapse the same and move the music spool to the right. Thus, if the music sheet wanders or moves to the left to cover the opening A, the music spool will be automatically moved to the right so that the music sheet will be moved back to its normal position. The same arrangement of valves is employed in connection with the pneumatic P′ and the parts are arranged so that if the music sheet wanders to the right, the opening A′ will be covered and the pneumatic P′ operate to move the music sheet to the left to its normal position. Thus, so long as the music sheet remains in normal position on the tracker between the two openings A and A′, the pneumatics will not operate, but if the music sheet wanders in one direction or the other, the covering up of one or other of the openings A or A′ will restore the music sheet to its normal position.

A modified form of valve mechanism is shown in Fig. 6. In this arrangement, the passage 22 connects by an opening 42 above a diaphragm 43. Air is admitted under the diaphragm by a restricted opening 44. The exhaust is connected above the diaphragm by a restricted passage 45. The opening 42 is made larger than the opening 45 so that when the opening A of the tracker is uncovered, air will flow through the opening 42 faster than it can escape through the small exhaust opening 45 and hence no vacuum or suction will be effected above the diaphragm 43. But when the opening A is closed by the music sheet, the exhaust through the opening 45 will then lift the diaphragm. The diaphragm is connected by a stem 46 to operate a hinge valve 47 which controls a port 48 controlling the admission of air to a passage 35 which operates diaphragm 36 and parts 37 to 41 inclusive, arranged as previously described to control the exhaust into the pneumatic P, except that in this arrangement, the diaphragm 36 has a small bleeding opening 70 to allow valve 37 normally to seat. This arrangement operates substantially as previously described, it being understood that when this modification is used, one valve mechanism, such as shown in Fig. 6, is employed with the pneumatic P and a similar mechanism in connection with the pneumatic P′.

The principle of the valve mechanism is, that so long as the controlling opening which regulates the same is connected to the atmosphere, the atmosphere is admitted to the operating pneumatic and so soon as the tracking controlling opening is covered by the music sheet, the exhaust is admitted to operate the pneumatic.

The arrangements herein shown and described may be varied by a skilled mechanic without departing from the scope of my invention as expressed in the claims.

Having thus fully described my invention,

what I claim and desire to secure by Letters Patent is,—

1. In an automatic player, the combination of a tracker having a series of note-operating openings, a tracking controlling opening for each side of the music sheet, which tracking controlling openings are arranged so that both will be uncovered when the music sheet is in normal position on the tracker, and operating mechanism controlled by said tracking controlling openings for restoring the normal relation between the tracker and music sheet when the music sheet moves sidewise out of normal position and one of said tracking controlling openings is covered.

2. In an automatic player, the combination of a tracker having a series of note-operating openings, tracking controlling openings at each end of the series of note-operating openings, the distance between said two tracking controlling openings being greater than the width of the music sheet, said tracking controlling openings being arranged so that both will be uncovered when the music sheet is in normal position on the tracker, and operating mechanism controlled by said tracking controlling openings for restoring the normal relation between the tracker and music sheet when the music sheet moves sidewise out of proper position and covers one of said tracker controlling openings.

3. In an automatic player, the combination of a tracker having a series of note-operating openings, a tracking controlling opening at each end of the series of note-operating openings, which tracking controlling openings are arranged outside of the normal track of the music sheet so that both will be uncovered when the music sheet is in normal position on the tracker, and operating pneumatics for restoring the normal relation between the tracker and music sheet when the music sheet moves sidewise out of normal position and covers one of said tracking controlling openings, and valve mechanisms actuated from said tracking controlling openings for admitting exhaust to said operating pneumatics.

4. In an automatic player, the combination of a tracker having a series of note-operating openings, a tracking controlling opening at each end of the series of note-operating openings, which tracking controlling openings are arranged outside of the normal track of the music sheet so that both will be uncovered when the music sheet is in normal position on the tracker, operating pneumatics for restoring the normal relation between the tracker and music sheet when the music sheet moves sidewise out of proper position and covers one of said tracking controlling openings, and valve mechanisms for admitting exhaust to said pneumatics, each of which valve mechanisms is controlled by a diaphragm acted upon one side by air passing through the controlling opening and on the other side by the exhaust.

5. In an automatic player, the combination of a tracker having a series of note-operating openings, a tracking controlling opening at each end of the series of note-operating openings, which tracking controlling openings are arranged outside of the normal track of the music sheet so that both will be uncovered when the music sheet is in normal position on the tracker, operating pneumatics for restoring the normal relation between the tracker and music sheet when the music sheet moves sidewise out of proper position and covers one of said tracking controlling openings, and valve mechanisms for admitting exhaust to said pneumatics, each of which valve mechanisms is controlled by a diaphragm acted upon one side by air passing through the controlling opening and on the other side by the exhaust.

6. In an automatic player, the combination of a tracker having a series of note-operating openings, a tracking controlling opening at each end of the series of note-operating openings, which tracking controlling openings are arranged outside of the normal track of the music sheet so that both will be uncovered when the music sheet is in normal position on the tracker, operating pneumatics for restoring the normal relation between the tracker and music sheet when the music sheet moves sidewise out of proper position and covers one of said tracking controlling openings, and a valve mechanism for each pneumatic comprising a valve connected to control the admission of exhaust into the pneumatic, a diaphragm operating said valve, which diaphragm is controlled by exhaust on one side and by air from the tracking controlling opening on the other, and a bleeding or restricted passage connecting the two sides of the diaphragm.

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

LOUIS W. SOUTHGATE.

Witnesses:
E. M. ALLEN,
C. FORREST WESSON.