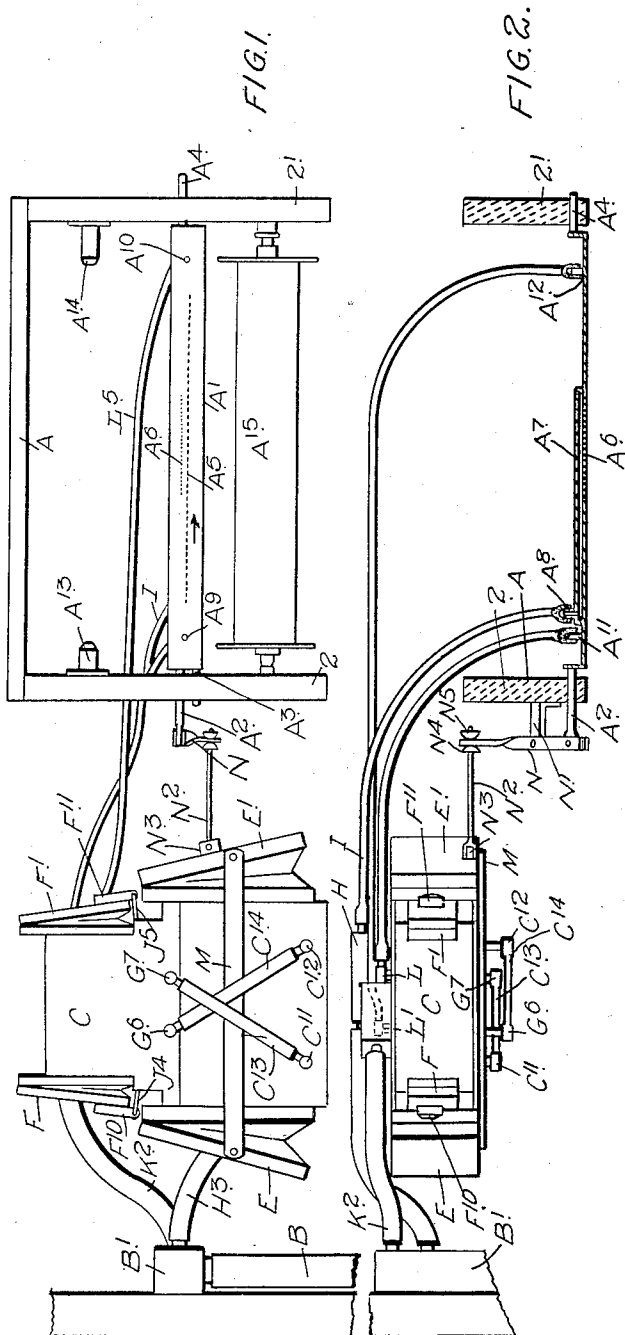


F. W. BULL.
 OPERATING MECHANISM FOR TRACKER BARS.
 APPLICATION FILED MAY 15, 1911.

1,021,747.

Patented Mar. 26, 1912.

2 SHEETS—SHEET 1.



WITNESSES

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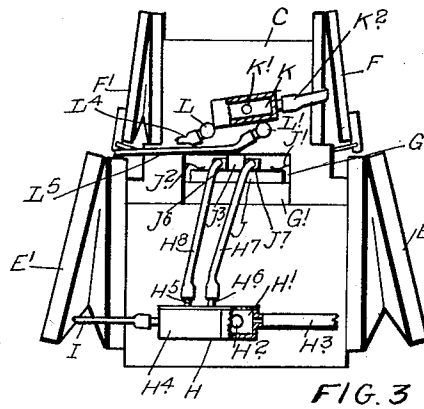


FIG. 3

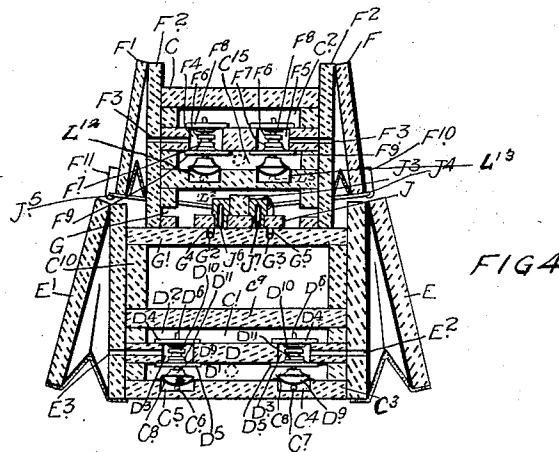


FIG. 4

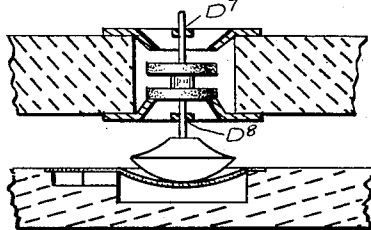


FIG. 5.

WITNESSES

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OPERATING MECHANISM FOR TRACKER-BARS.

1,021,747.

Specification of Letters Patent.

Patented Mar. 26, 1912.

Original application filed March 10, 1911, Serial No. 613,503. Divided and this application filed May 15, 1911. Serial No. 627,191.

To all whom it may concern:

Be it known that I, FRANK WESLEY BULL, of the town of Oshawa, in the county of Ontario, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Operating Mechanisms for Tracker-Bars, of which the following is the specification.

My invention relates to improvements in operating mechanisms for tracker bars and the object of the invention is to devise a simple and efficient valve operating mechanism for imparting the longitudinal movement to the tracker bar such as described in my divisional application No. 613,503, and it consists essentially of a valve casing, a pair of valve chambers therein, a vacuum chamber and a chamber communicating with the atmosphere, a valve operating in each valve chamber, pneumatics communicating with the valve chambers and a selecting device for operating the valve corresponding to the end tracker bar duct as hereinafter more particularly explained by the following specification.

Figure 1, is a front elevation of my device operatively connected to a tracker bar. Fig. 2, is a plan view of Fig. 1 of my device. Fig. 3, is a rear detail elevation of my valve box. Fig. 4, is a sectional elevation of my valve box. Fig. 5, is an enlarged sectional detail of one of the valves located in the valve box.

In the drawings like characters of reference indicate corresponding parts in each figure.

I will first describe generally the construction of the tracker bar and parts co-acting with my valve mechanism to impart longitudinal movement to the bar.

A is the frame of the instrument.

A' is the tracker bar provided with stems A² and A³ and A⁴ slidably held within the side portions 2 and 2' of the frame A. The tracker bar A' is provided with the usual eighty-eight note ducts A⁵.

A⁶ are a series of supplemental ducts located between the note ducts, that is to say, directly above the partition dividing the note ducts.

A⁷ is a duct secured to the back of the tracker bar A' and into which the ducts A⁶ lead. The duct A⁷ is provided with a nipple A⁸.

A⁹ and A¹⁰ are supplemental ducts formed

in the tracker bar in proximity to each end thereof and substantially opposite the path of travel of each edge of the paper of the music roll.

A¹¹ and A¹² are nipples extending from the ducts A⁹ and A¹⁰.

A¹³ and A¹⁴ are bearings for supporting the music roll and A¹⁵ is the take-up roll.

B is the main tube leading from the main reservoir to the wind chest B'.

I will now describe my valve mechanism for imparting the required movement to the bar A' and forming the subject matter of the present application.

C is the valve box designed to control the movement of the tracker bar when the ducts A⁶ and ducts A⁹ and A¹⁰ are uncovered.

I will now describe the construction of the valve box C.

C' is the lower valve chamber (see Fig. 4) and C² the upper valve member. The lower valve chamber C' comprises the base board C³ having recesses C⁴ and C⁵ into which ducts C⁶ and C⁷ extend, the recesses C⁴ and C⁵ are provided with pouches C⁸ extending over the same.

D is a partition extending across the valve chamber intermediately of the height thereof and dividing such chamber into a vacuum chamber D' and the chamber D² which is open to the atmosphere.

D³ are orifices extending through the partition D above and below which are secured the upper and lower valve seats D⁴ and D⁵.

D⁶ is the valve stem extending through the orifices D⁷ and D⁸. The lower end of the valve stem is provided with the buttons D⁹ resting upon the pouch C⁸.

D¹⁰ and D¹¹ are the upper and lower valves designed to co-act alternately with the upper and lower valve seats D⁴ and D⁵ respectively.

E and E' are the lower pneumatics.

E² and E³ are ducts leading from the lower pneumatics E and E' to the orifices D³.

F and F' are the upper pneumatics supported upon the end boards F² at each end of the upper valve chamber C².

The valve chamber C² is similarly constructed to the lower valve chamber C' as hereinbefore described and is provided with similar ducts F³ leading from the upper pneumatics F and F' to the orifices F⁴ and F⁵ in which the valves F⁶ and F⁷ operate and co-act with the seats F⁸ and F⁹. Be-

neath the upper valve chamber C² is located a supplemental valve chamber G having a base board G' supported upon the top board C⁹ by the end pieces C¹⁰.

5 G² and G³ are ducts formed in the base board G', such ducts being provided with vertical portions G⁴ and G⁵ extending through the upper face of the board G'.

10 G⁶ and G⁷ are nipples secured in the outer ends of the ducts G² and G³ (see Fig. 1).

C¹¹ and C¹² are nipples secured in the ducts C⁶ and C⁷.

15 C¹³ and C¹⁴ are crossed tubes connecting the nipple G⁶ with the nipple C¹² and the nipple G⁷ with the nipple C¹¹.

H is a divided wind chest, the portions H' of which communicate with the vacuum chamber D' of the lower valve chamber C' by means of the orifice H².

20 H³ is a tube leading from the portions H' of the wind chest H to the main wind chest B'.

25 I is a tube leading from the portions H⁴ of the wind chest H to the tube A⁷ secured to the tracker bar A' and with which the ducts A⁹ communicate.

30 J is a slide valve held against the board G' by the springs J¹ and J². The slide valve J is provided with a central cross bar J³ connected by links J⁴ and J⁵ to the lugs F¹⁰ and F¹¹ secured to the movable portions of the upper pneumatics F and F'.

35 J⁶ and J⁷ are nipples extending through the slide valve J and forming ducts leading to the lower face of the slide valve.

H⁵ and H⁶ are nipples leading into the portions H⁴ of the wind chest H.

H⁷ and H⁸ are tubes leading from the nipples H⁵ and H⁶ to the nipples J⁶ and J⁷.

40 K is a wind chest secured to the casing of the upper valve chamber C² and communicating with the vacuum chamber C¹⁵ by means of the orifice K'.

45 K² is a tube leading from the wind chest K to the main wind chest B'.

L and L' are nipples secured in the ducts L² and L³ shown by dotted lines in Fig. 4 where they lead into the pouch recesses L¹² and L¹³.

50 L⁴ and L⁵ are tubes leading from the nipples L and L' to the nipples A¹¹ and A¹² communicating with the orifices A⁹ and A¹⁰ of the tracker bar.

55 M is a link pivotally connected at each end to the movable portions of the lower pneumatics E and E'.

60 N is a lever pivotally connected upon the bracket N' intermediately of its length. The outer end of the lever N is pivotally connected to the flattened end of the stem A². The opposite end of the lever is connected by a link N² to the lug N³ secured to the lower pneumatic E'. The opposite end of the link passes through the enlarged opening in the lever N and is secured in

position therein by the semi-spherical nuts N⁴ and N⁵ bearing against each side of the lever N.

Having described the principal parts involved in my invention I will briefly describe the operations of the same. 70

It will be understood that, as the perforated paper of the music roll passes over the tracker bar with each edge of the paper normally and substantially covering or partially covering the ducts A⁹ and A¹⁰ and the ducts A⁶ are also normally covered, should the perforations of the paper, however, for any reason be out of alinement with the note ducts of the tracker bar it will necessarily uncover the supplemental ducts of the tracker bar located between the note ducts. For the purpose of illustration we will assume that the paper has moved in the direction of the arrow or that the edge of the paper or the position of the perforations therein are faulty thereby uncovering the duct A⁹ and the ducts A⁶. When this takes place the air passes through the tube L⁴, through the nipple L of the tube, into the recess L¹² beneath the valves F⁶ and F⁷ thereby raising the pouch thereof and the valve off the seat F⁹ and against the seat F⁸. By this operation suction is produced from the upper pneumatic F', through the duct F³, orifice K', wind chest K, tube K² leading to the main wind chest B' which is connected to the main bellows by the tube B. This operation draws the pneumatic F' into its closed position allowing the pneumatic F which remains open to the atmosphere to open. The pneumatics F and F' as hereinbefore described are connected by the links J⁴ and J⁵ to the slide valve J thereby moving the slide valve so that the nipple J⁷ registers with the extension G⁵ of the duct G³. This operation allows the air to pass from the ducts A⁶ through the tube A⁷, tube I, through the wind chest H, tube H⁷, nipple J⁷, duct G³ leading to the nipple G⁶ communicating with the tube C¹⁴ and the nipple C¹² communicating with the recess C⁵ beneath the pouch C⁸ of the valve D⁹ to the left of Fig. 4 thereby raising the valve disk D¹¹ off the seat D⁵ and lifting the valve disk D¹⁰ against the seat D⁴ and thereby placing the pneumatic E' in communication with the vacuum chamber D' by means of the duct E³ and thereby drawing the pneumatic E' into its closed position. This operation moves the tracker bar by means of the link N² and the lever N so as to carry the note ducts into alinement with the perforations of the music roll. It will of course be understood that the same operation takes place should the paper move in the opposite direction or should the duct A⁶ and the duct A¹⁰ at the opposite end of the tracker bar be open simultaneously to the atmosphere. When such is the case of course air passes 130

through the tube L⁵, through the nipple L', into the recess beneath the valve F⁵ thereby lifting such valve and thereby bringing the pneumatic F into communication with the vacuum chamber C¹⁵. By this operation the slide valve J is moved in the opposite direction to that previously described thereby bringing the nipple J⁶ in a position to register with the ducts G⁴ and G². Air then passes through the uncovered ducts A⁶, through the tube I, wind chest H, tube H⁸, through the nipple G⁴ and duct G² to the nipple G⁷ from whence it passes through the tube C¹³ to the nipple C¹¹ connected by the duct C⁷ to the recess C⁴ thereby lifting the corresponding valve supported over the same and bringing the pneumatic E into communication with the vacuum chamber D' through the duct E². This operation closes the pneumatic E thereby moving the tracker bar in the opposite direction to that hereinbefore described.

It will be seen from this description that I have devised a very simple device whereby the tracker bar may be pneumatically moved so as to carry the note ducts of the same into alinement with the perforations of the music roll thereby insuring that the perforations of the paper track with the note ducts of the tracker bar.

What I claim as my invention is,

1. An operating mechanism for a horizontally movable tracker bar, having supplemental ducts located just behind the partitions between the note ducts and end ducts, comprising a valve box having a pair of valve chambers communicating with the end ducts of the tracker bar and valves and a vacuum chamber, opposing pneumatics communicating with the valve chambers, and means including a slide valve operated by the uncovering of the supplemental ducts for raising the valve corresponding to the uncovered end duct, as and for the purpose specified.

2. An operating mechanism for a horizontally movable tracker bar, having supplemental ducts located just behind the partitions between the note ducts and end ducts, comprising a valve box having a pair of valve chambers communicating with the end

ducts of the tracker bar and valves and a vacuum chamber, opposing pneumatics communicating with the valve chambers and a slide valve operated by the uncovering of the supplemental ducts designed to open up communication between the uncovered end duct and the corresponding valve chamber, as and for the purpose specified.

3. An operating mechanism for a horizontally movable tracker bar, having supplemental ducts located just behind the partitions between the note ducts and end ducts, comprising a valve box comprising an upper and lower valve chamber each divided into a vacuum and atmospheric chamber, pneumatics supported at the ends of the valve chambers, ducts leading from the valve chambers into the pneumatics, valves designed to open and close communication between the vacuum chambers, atmospheric chamber, and the pneumatics, a slide valve seat provided with ducts leading from the atmosphere to beneath the alternately operated valves of the lower valve chamber, a slide valve provided with ducts designed to alternately register with the valve seat ducts, and suitable connecting means between the slide valve and the upper pneumatics, as and for the purpose specified.

4. In a device of the class described, a valve box comprising an upper and lower valve chamber each divided into a vacuum and atmospheric chamber, pneumatics supported at the ends of the valve chambers, ducts leading from the valve chambers into the pneumatics, valves designed to open and close communication between the vacuum chambers, atmospheric chamber, and the pneumatics, a slide valve seat provided with ducts leading from the atmosphere to beneath the alternately operated valves of the lower valve chamber, a slide valve provided with ducts designed to alternately register with the valve seat ducts, and suitable connecting means between the slide valve and the upper pneumatics, as and for the purpose specified.

FRANK WESLEY BULL.

Witnesses:

H. PRESTON,
M. EGAN.