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F. MORITZ.
MECHANICALLY PLAYING KEYED INSTRUMENT.
APPLICATION FILED MAR. 8, 1907.

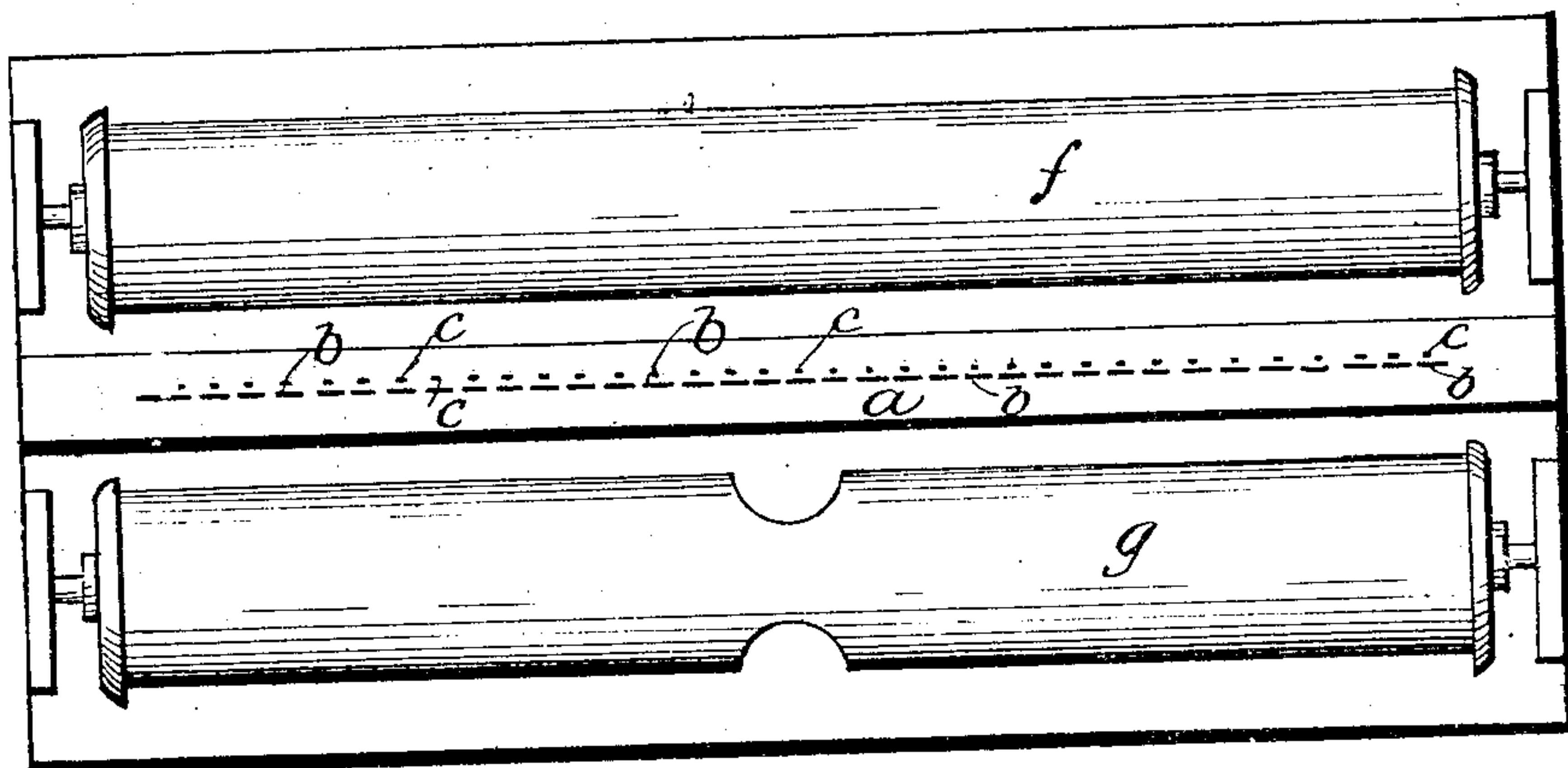


Fig. 1

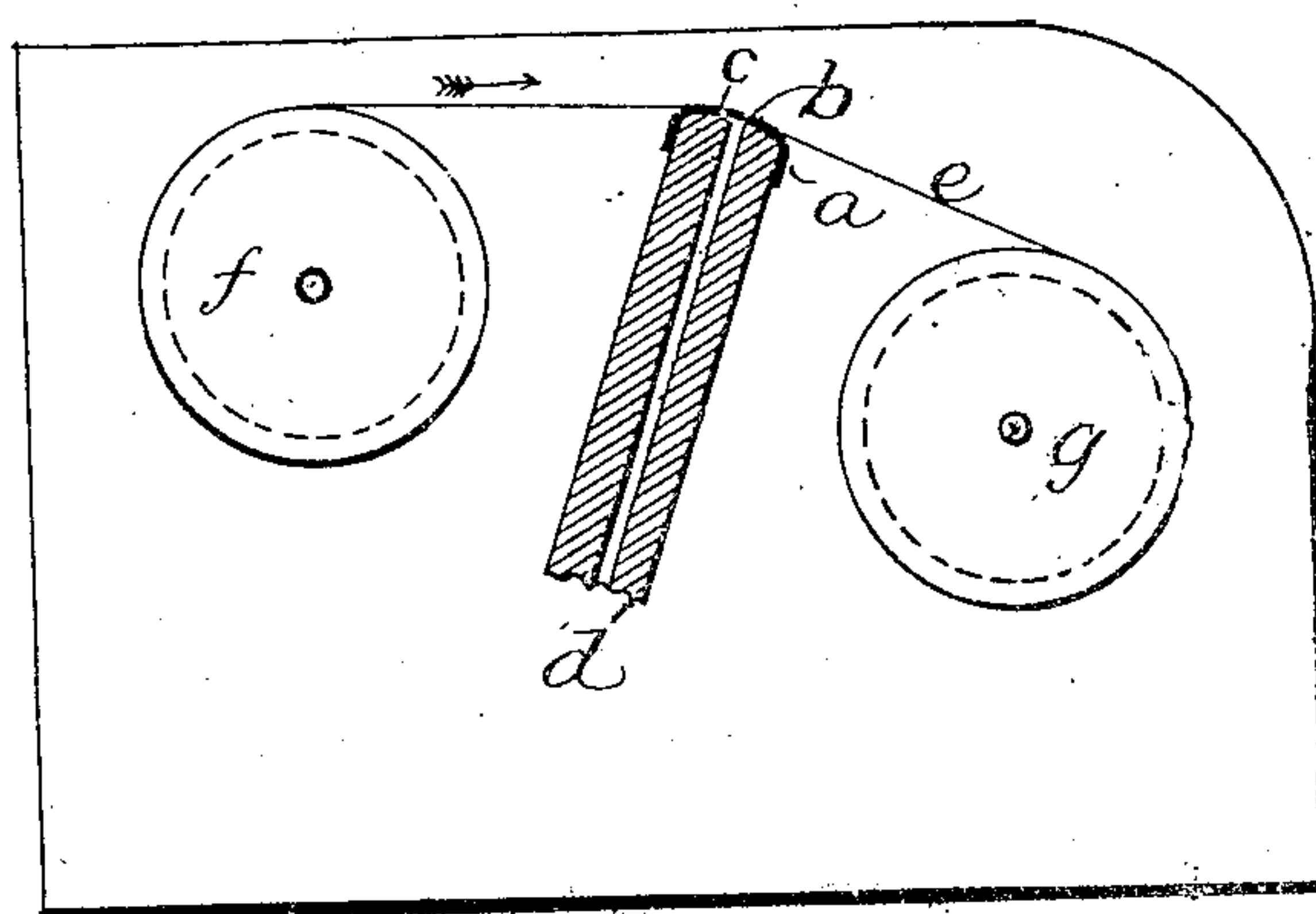


Fig. 2

WITNESSES

C. B. Weikert
J. P. Himes.

Friedrich Moritz

INVENTOR

By Connolly Bros

Attorneys

UNITED STATES PATENT OFFICE.

FRIEDRICH MORITZ, OF DORTMUND, GERMANY

MECHANICALLY-PLAYING KEYED INSTRUMENT.

No. 880,089.

Specification of Letters Patent.

Patented Feb. 25, 1908.

Application filed March 8, 1907. Serial No. 361,342.

To all whom it may concern:

Be it known that I, FRIEDRICH MORITZ, citizen of Germany, subject of the King of Prussia and Emperor of Germany, residing at Dortmund, in the Kingdom of Prussia and Empire of Germany, have invented certain new and useful Improvements in Mechanically-Playing Keyed Instruments, of which the following is a full, clear, and exact description.

Piano playing apparatus, orchestrions and the like, when they work by air suction, draw the air through suitable channels in a tracker board, over which a slotted note band or a band provided with holes is led. The channels in the tracker board require, in order to produce the proper action on the key board, a certain length and corresponding admission of air. The longer these channels are so much longer are the note holes in the music sheet or band and also so much longer must be the note band, as well as the time occupied in striking a note, which must be made as short as possible. If this is the case with single notes, it is much more the case with a series of notes following quickly one after the other, trills and the like, and on account of the large amount of air, which is necessary for wide channels, especially also with musical works having a large number of notes on a short stretch of the note band. The drawbacks brought about by channels with large outlets are obviated by the present invention.

Figure 1 is a top view of the device applied to a mechanical piano working by suction. Fig. 2 is a transverse vertical section of the device as applied.

In the drawings *f* and *g* designate respectively the rollers upon which the perforated music sheet *e* is wound, said sheet passing over the tracker board *d*, which is located between the rollers *f* and *g*, the latter being operated in the usual and well known manner.

The long channels of the tracker board *d* are covered at the top with a metal plate *a*, which has the same number of openings *c* as the tracker board although in the direction of the travel of the sheet *e* over the tracker board, they are kept as short as possible. In order to make it possible for these short channel openings to fill sufficiently and suddenly with air, so that a short powerful blow can be struck before each narrow channel opening a special inlet or preliminary opening *b* is provided. This opening *b* is only made so large

that it alone, if the short channel opening is not yet uncovered by the holes in the note band, does not allow enough air to enter to operate the playing mechanism. Nevertheless this opening fulfils the next condition, namely that a vacuum no longer exists in the previously evacuated channels.

When now the note holes come over the preliminary opening *b* they come next over the short channel opening *c* and just at the time when the preliminary opening also is still free. If the preliminary air has already fulfilled the condition of the change of air, the short channel opening which can be made so short that it alone even with powerful tread movement hardly produces any playing, is in the position, in combination with the preliminary opening, to set the playing apparatus in motion.

When the stroke or blow has been completed on account of the two openings, preliminary air opening and short channel opening becoming uncovered, the action thereby produced only lasts a short time, since the note band again covers the preliminary air opening, and it of course results in withdrawal of the preliminary air, and also removal of the striking power. These preliminary air openings and short channel openings arranged as above described make it possible to produce trills as well as soft playing exactly as with the powerful tread movement. Further by the provision of the preliminary air openings an economical consumption of the quantity of air produced in playing is brought about. All the variations, such as "crescendo" or "decrescendo" and toning of the single notes can be readily produced by the player. Moreover the player in working the treads has not to apply any special power.

Owing to the wide channel openings of the previous arrangements, the note band was sucked firmly on to the slide block and thereby braked or retarded so that on operating the treads a great resistance had to be overcome.

In the present invention the powerful suction is completely avoided by the provision of preliminary air openings since these small openings only give a small engagement surface on the note band. The consumption of air is also more economical.

By means of the device set out in the above description a further drawback is overcome,

which existed with the previous arrangements, that the note band left the notes free on one side only, while the other side sucked firmly on to the slide block, so that the note band became defective or got damaged.

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

1. A tracker board having air channels and having a metal plate attached to said tracker board over its air channels, said plate having main and supplementary openings leading to the tracker board channels,—a main and a supplementary opening leading to each tracker board channel,—the main opening in the plate being slits of least dimension in the direction of travel of the sheet, and the supplementary openings in the plate

being arranged in advance of the main openings.

2. A tracker board having channels and main and supplementary openings leading to the tracker board channels—a main and a supplementary opening leading to each channel—the main openings being slits of least dimension in the direction of travel of the sheet, and the supplementary openings being arranged in advance of the main openings.

In witness whereof, I subscribe my signature, in presence of two witnesses.

FRIEDRICH MORITZ.

Witnesses:

OTTO KÖNIG,

J. A. RITTERSHAUS.