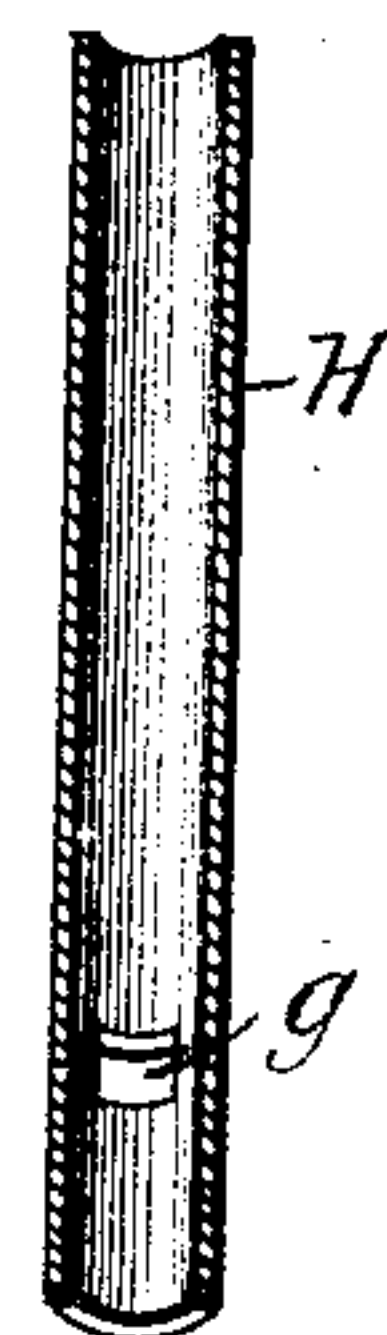
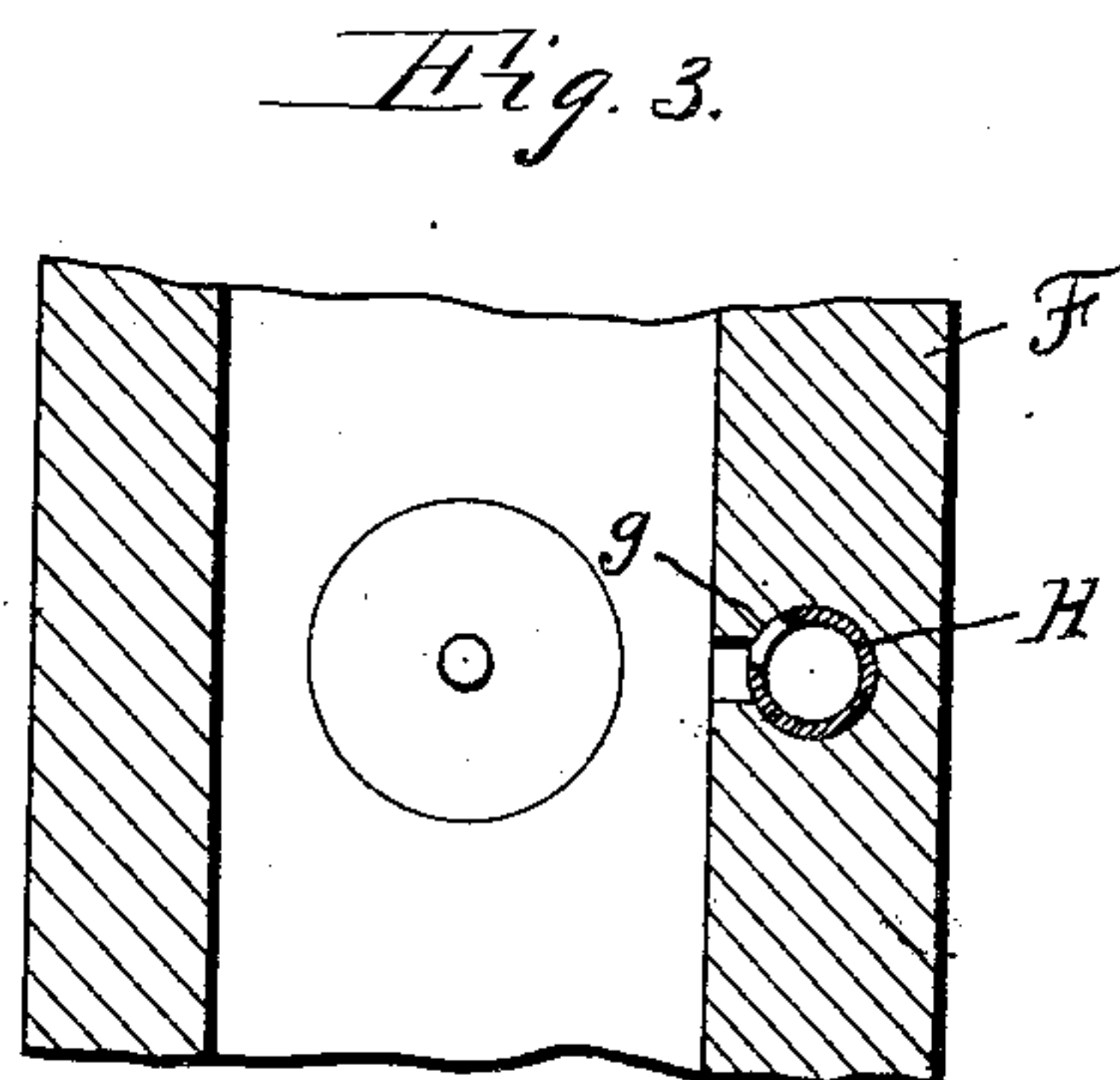
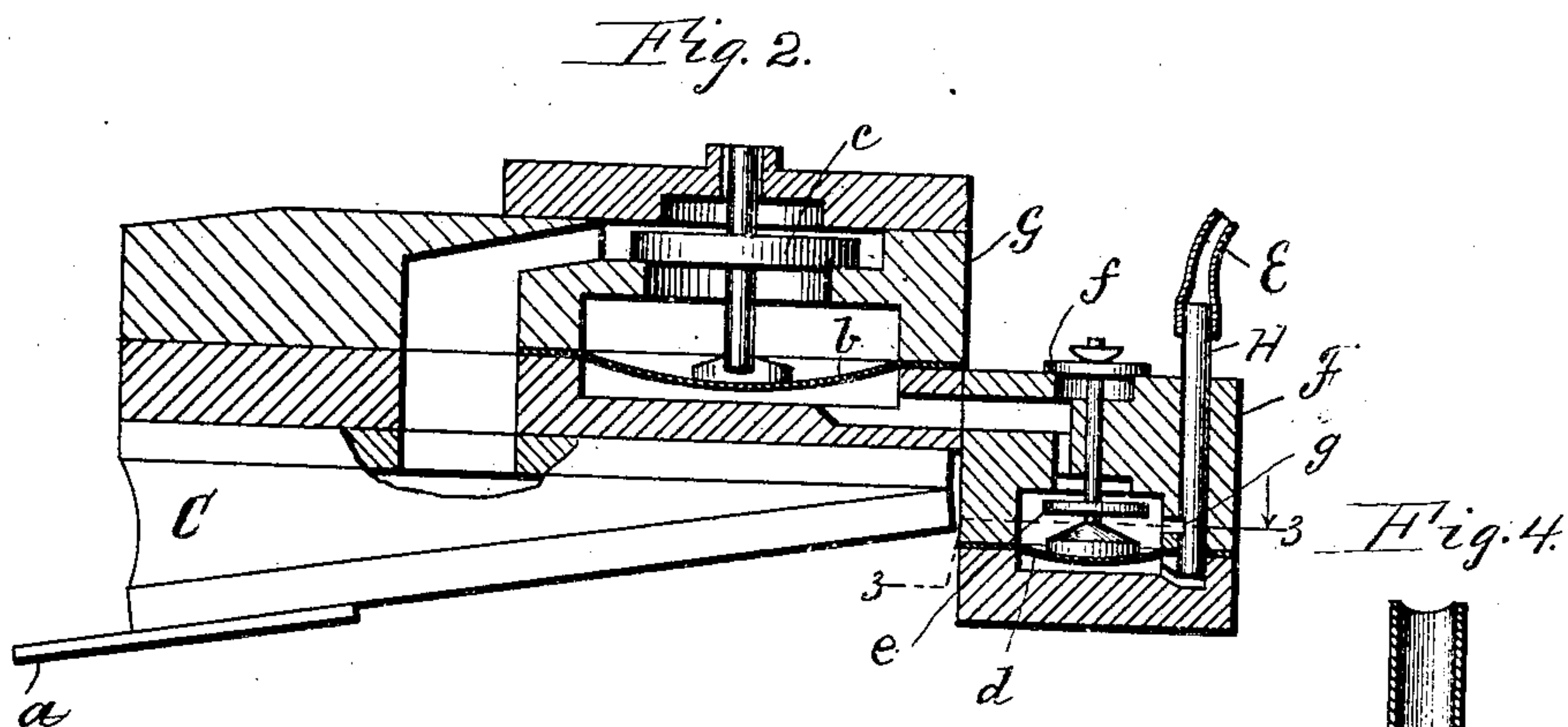
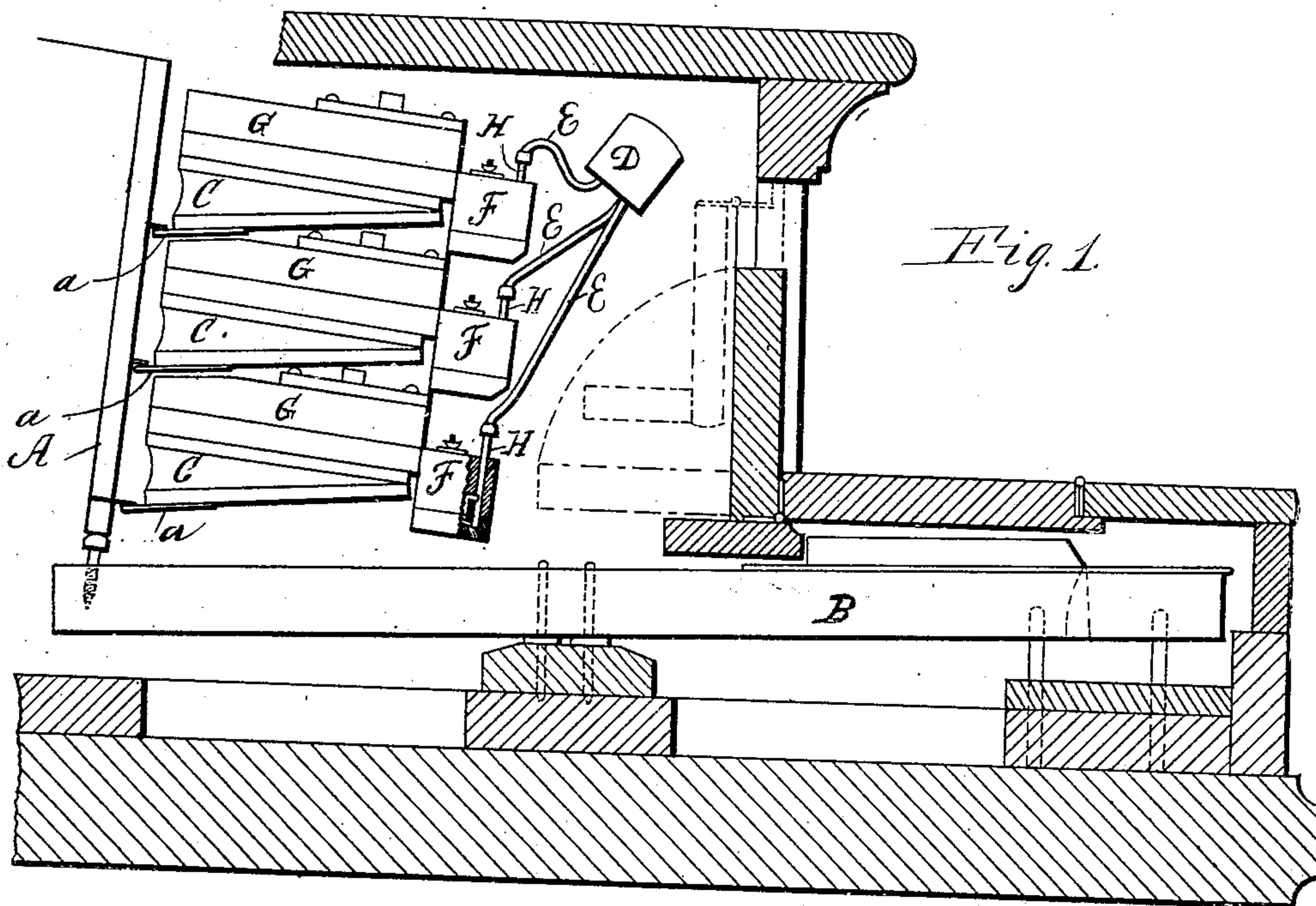


No. 877,080.

PATENTED JAN. 21, 1908.

B. A. HOGGLUND.  
MECHANICAL MUSICAL INSTRUMENT PLAYER.  
APPLICATION FILED NOV. 27, 1905.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

BERNDT ALFRED HOGLUND, OF NEW YORK, N. Y.

## MECHANICAL MUSICAL-INSTRUMENT PLAYER.

No. 877,080.

Specification of Letters Patent.

Patented Jan. 21, 1908.

Application filed November 27, 1905. Serial No. 289,185.

*To all whom it may concern:*

Be it known that I, BERNDT ALFRED HOGLUND, a subject of the King of Sweden, residing at New York city, in the county and State of New York, have invented certain new and useful Improvements in Mechanical Musical-Instrument Players, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact specification.

My present invention has relation to that class of devices employed for mechanically playing musical instruments and particularly to such as are operated through the medium of external air pressure.

The principal objects of my invention are to provide a simple, cheap, efficient and readily adjustable appliance whereby the tension of the atmosphere in the tubes may be automatically restored to the proper condition after it has been utilized in effecting the operation of the mechanical player, and to render the player easily operable by employing tubes of small diameter in connection with the tracker.

To accomplish the above named objects and to secure other and further advantages in the matters of construction, operation and use, my improvements involve certain new and useful arrangements or combinations of parts and peculiar features of construction, as will be herein first fully described and then pointed out in the claims.

In the accompanying drawings forming part of this specification I have illustrated only so much of a mechanical musical instrument player as will suffice for the proper understanding of my improvements.

Figure 1, is a vertical section and elevation showing part of a mechanical player with air tubes in place and my improvements applied in connection therewith and in connection with the striking mechanism.

Fig. 2, is a sectional elevation on a larger scale showing the general details of construction and arrangement of one of the pneumatics of the player and my improved bleeding device in place in connection therewith.

Fig. 3, is a horizontal section and plan view on planes through the broken line 3—3 of Fig. 2. Fig. 4, is an enlarged detail view in section and elevation of the perforated tube as it appears when detached from the box and from the flexible tube with which it is intended to be connected.

In all these figures like letters of reference,

wherever they occur, indicate corresponding parts.

In these mechanisms the devices which are operated by air are ordinarily known as "pneumatics" whatever may be their form or construction.

A represents one of the sticks connected with one of the keys, as B, of the musical instrument. When the instrument is to be played by mechanical means each one of these sticks is connected with a suitable pneumatic by which it is caused to rise and fall at the proper time to strike the note.

C, C, C, are pneumatics in the form of ordinary bellows, the mechanical player having one for each finger key or for each stick, each being connected with its appropriate stick as by a projecting piece *a*.

D represents the ordinary tracker over which a perforated music sheet is moved at a determined rate, and connected with this tracker are flexible tubes, as E, each leading to a valve chest F.

By suitable means air is being constantly exhausted from the valve chests while the player is in operation, and the tubes E each convey a small quantity of air from the tracker to operate the primary pneumatics which control the power pneumatics and allow the bellows C to collapse under external pressure and thereby strike the desired note. This general operation so far referred to is now well understood.

I employ a small valve mechanism in chest F and a large one in a chest G, communication being established between the two chests and the smaller valve mechanism being employed to admit air to the larger one, whereby a less quantity of air is required to pass through tubes E, which tubes may therefore be made small and the operating device made compact and more sensitive.

In chest G a diaphragm *b* carries a valve *c*, the latter being arranged to normally close the port leading to the interior of bellows C. When this valve is elevated, as it will be as soon as air is admitted to the underside of diaphragm *b*, air is exhausted from bellows C, which instantly collapses, causing the note to be struck and then instantly returns to its normal distended position.

To admit air to the underside of the diaphragm *b* which is comparatively large, I employ a smaller diaphragm *d* in chest F, the same carrying two valve disks *e* and *f*, arranged to open or close the passages leading



to the underside of diaphragm *b*, one from the interior and one from the exterior of chest *F*. As soon as the diaphragm *d* rises, which it does when air is admitted to its underside, the valve *f* opens the port to the exterior air and admits a sufficient quantity of air to the underside of the larger diaphragm *b*, the valve *e* being closed against its seat by the same movement. When the supply of air to the underside of diaphragm *d* is cut off, then it falls or is drawn down, and the ports resume their normal position.

Each tube *E* communicates with the space below the corresponding diaphragm *d*; and when air is admitted to tube *E* the tension of the air within the tube is changed and it is necessary and desirable for proper operation that this tension be restored as quickly as may be, so that the next time the tube is opened to the exterior air, its contents will not interfere with the proper admission of another supply. I therefore connect each tube *E* with a metallic tube *H* seated in chest *F* and opening beneath diaphragm *d*, and in tube *H* I make a small perforation, as at *g*, located so as to register with a channel leading to the space above diaphragm *d*. After air is admitted through tube *E* to the underside of diaphragm *d* and the tube closed at the tracker, then exhaustion takes place through the opening *g* and the pressure of air in tube *E* is reduced or equalized with that in chest *F*. This equalization of the pressure within tubes *E* is called "bleeding" the tubes, and the bleeding is satisfactorily accomplished by the means shown and in the manner stated.

Tube *H* is seated in the wall of chest *F* as indicated in Figs. 2 and 3 and so that it may be turned in its seat to regulate the effective size of the opening *g*, the same being reduced or enlarged according to the position of the opening in respect to the wall of the communicating channel. By this simple means the desired regulation can be easily effected from the exterior of the valve chest and without disturbing any of the parts thereof.

The two valve chests are constructed independently of each other and arranged one at the side of the other, as indicated, so that the parts in either may be reached without disturbing those in the other.

The construction is simple and cheap and in all respects is found to answer the purposes or objects of the invention hereinbefore attended to.

Having now fully described my invention, what I claim as new herein and desire to secure by Letters Patent, is:—

1. In a mechanical musical instrument player, the combination of the striking pneumatic, the main valve chest containing a pneumatic for effecting the direct admission of air to the said striking pneumatic, a second and separate valve chest containing a pneumatic for effecting the direct admission of air to the pneumatic in the main valve chest and an adjustable perforated tube for admitting air to the pneumatic in the second valve chest, the two valve chests being located and arranged side by side, substantially as shown and described.

2. In a mechanical musical instrument player, the combination with the main valve chest containing a diaphragm, and a second and separately constructed valve chest also containing a diaphragm, of an adjustable air conducting tube extending below and opening below the diaphragm in the second valve chest, said tube having also a perforation arranged to communicate with the space above said diaphragm, for the purposes explained.

3. In a mechanical musical instrument player, the combination with the main valve chest containing a diaphragm, and a second and separately constructed valve chest also containing a diaphragm, of an adjustable metallic air conducting tube extending below and opening below the diaphragm in the second valve chest, said tube having also a perforation arranged to communicate with the space above the said diaphragm and, being seated in a perforation in the wall of the valve chest, substantially in the manner and for the purposes set forth.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

BERNDT ALFRED HOGLUND.

Witnesses:

C. SEDGWICK,  
J. M. HOWARD.