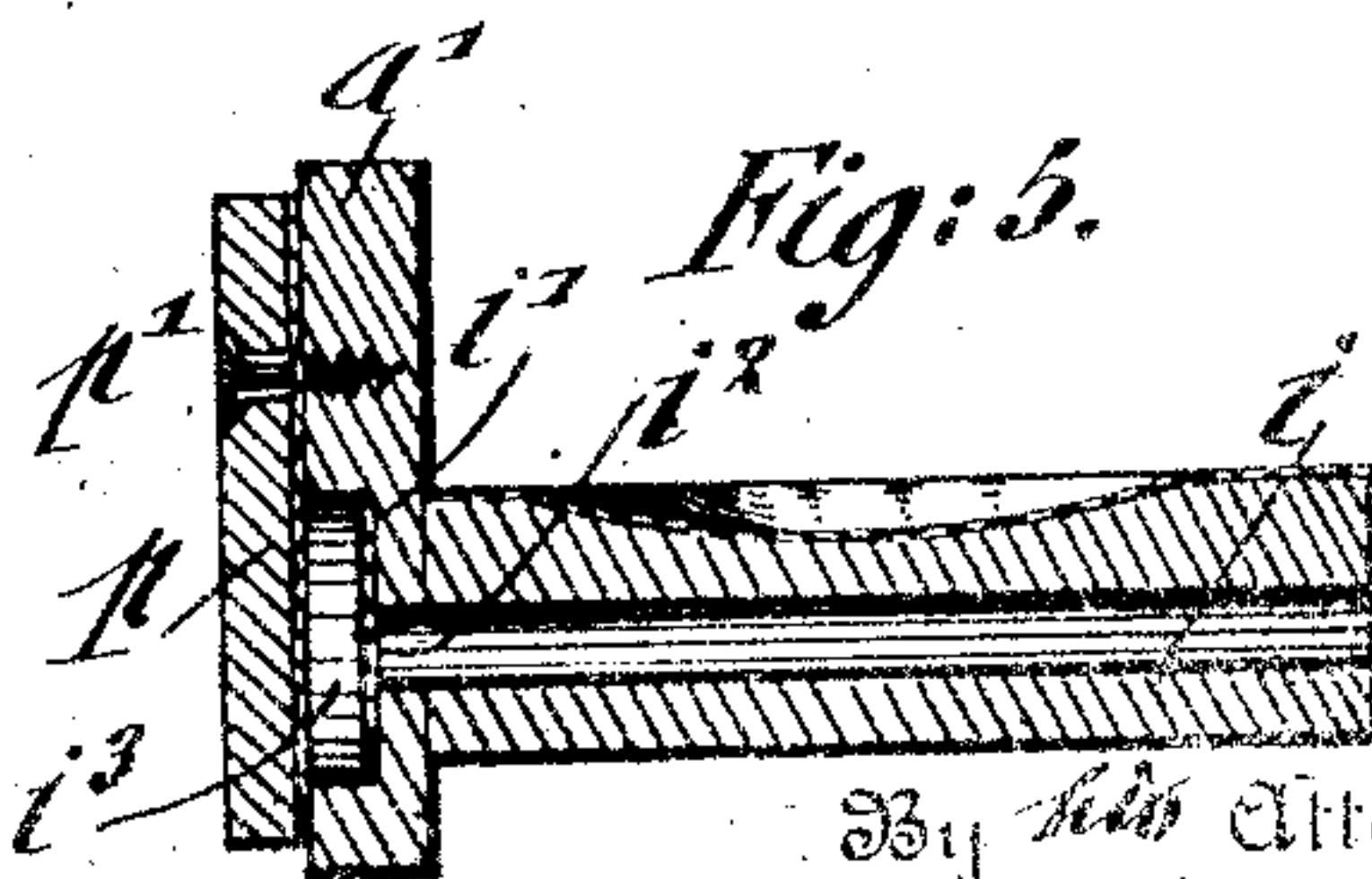
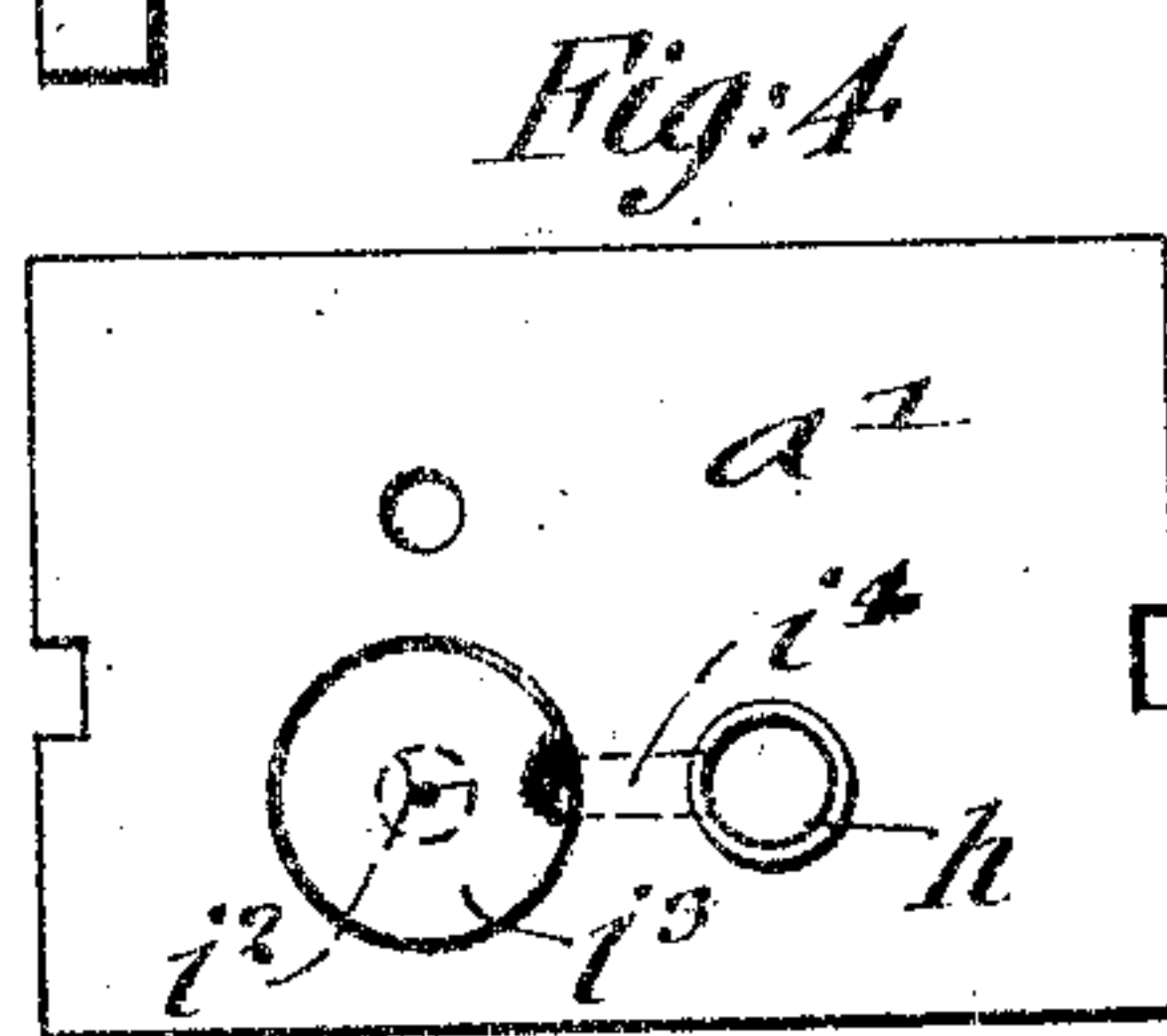
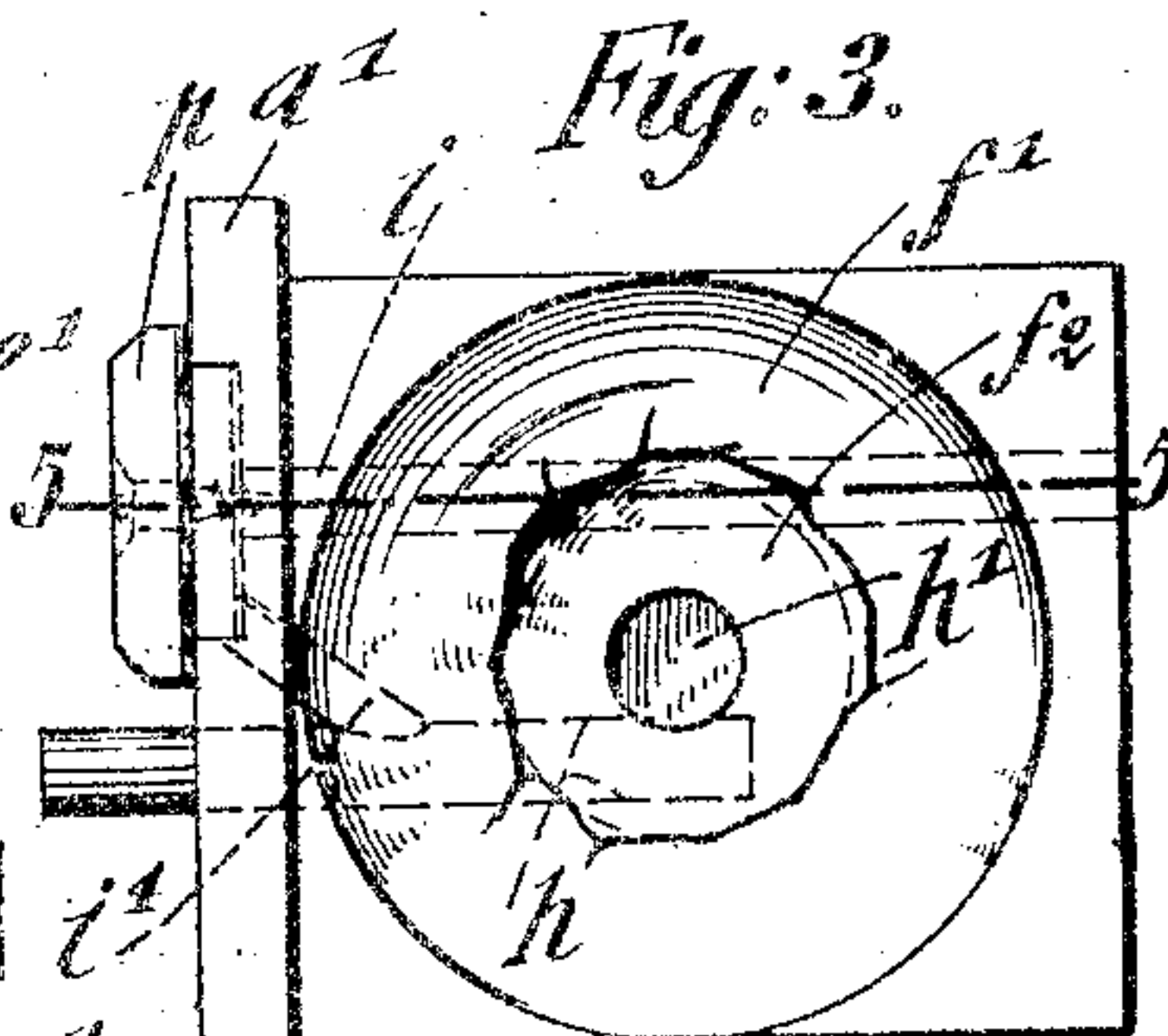
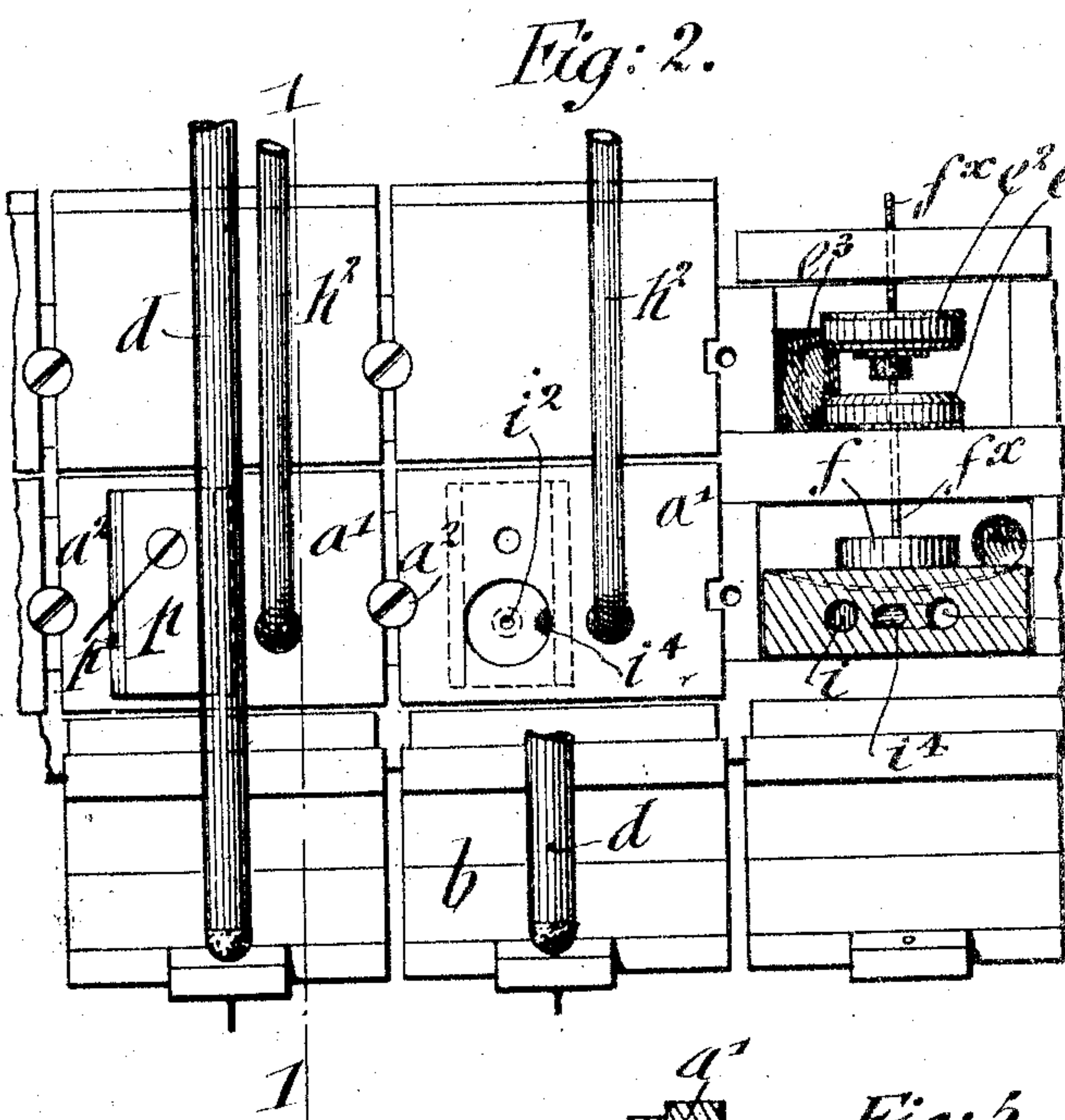
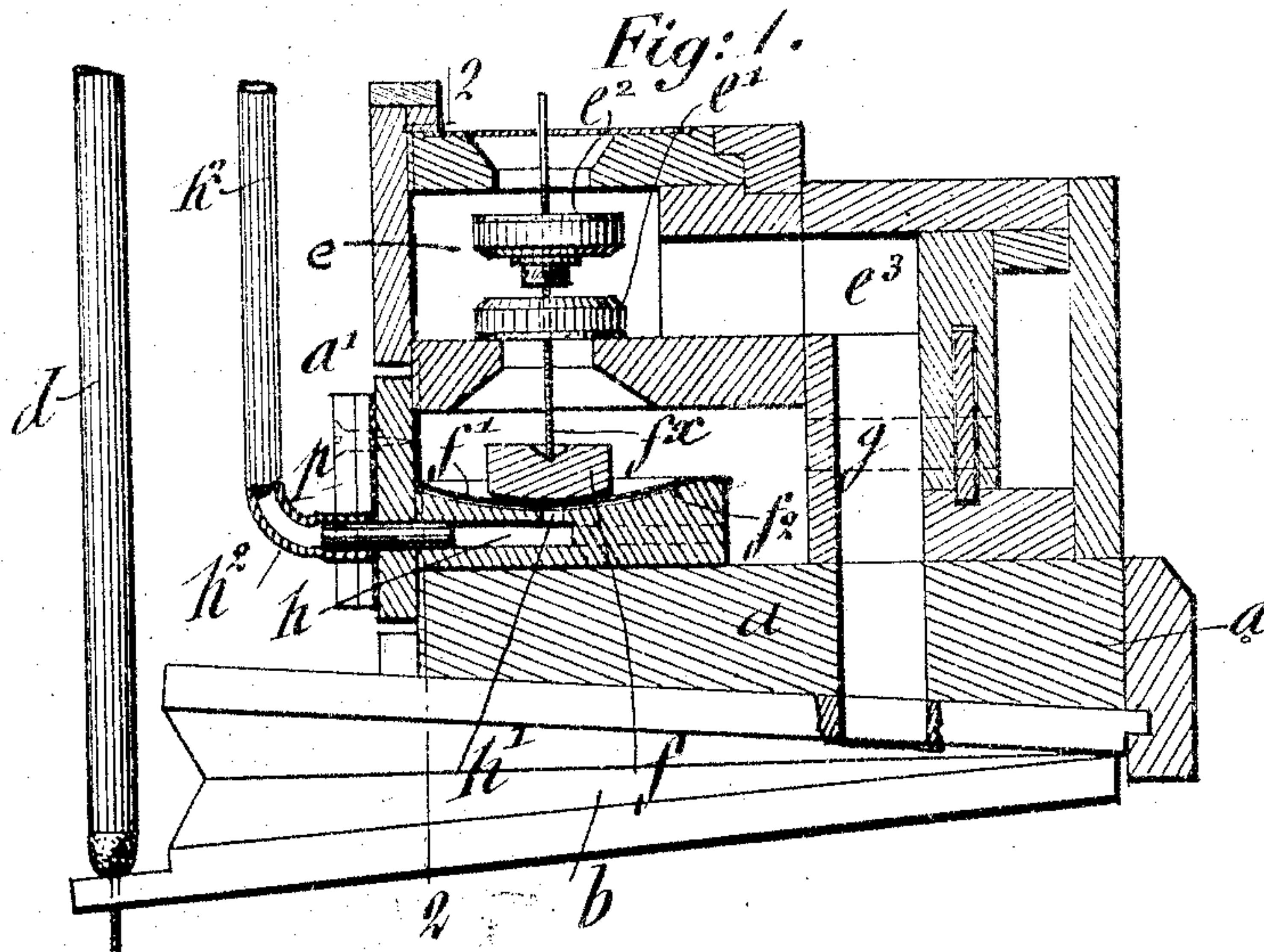


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J. WIESER.
PNEUMATIC VALVE ACTION.
APPLICATION FILED JULY 27, 1907.



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JOSEPH WIESER, OF NEW YORK, N. Y.

PNEUMATIC VALVE-ACTION.

No. 884,600.

Specification of Letters Patent

Patented March 31, 1908.

Application filed July 27, 1907. Serial No. 334,623.

To all whom it may concern:

Be it known that I, Joseph Wieser, a citizen of the United States, residing in New York, in the borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Pneumatic Valve-Actions, of which the following is a specification.

This invention relates to an improved pneumatic valve-action for piano-players, said valve-action being very sensitive in action so as to respond quickly to the air that is sucked in through the perforations of the music-sheet, and readily and individually accessible for cleaning and repairs; and for this purpose the invention consists of a pneumatic valve-action which comprises a double valve operated by a diaphragm operated by a channel and tube connected with the opening in the tracker, a duct connecting the valve-chamber with the bellows, a lifter operated by said bellows, a channel connecting the valve-chamber with the suction-chest, and a separate duct passing through the diaphragm-seat and connected by a small opening and lateral channel with the inlet-channel located in the diaphragm-seat so as to permit the free return of the diaphragm to its seat and the closing of the valves by the action of the auxiliary side-duct.

The invention consists further of other novel features of construction as will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a vertical transverse section of my improved pneumatic valve-action taken on line 1, 1, Fig. 2, Fig. 2 is a front-elevation of several pneumatic valve-actions in which the covering front-wall of the action is in position on the left-hand side of Fig. 2, removed at the middle part of Fig. 2, and in which the valve-action is shown in section at the right-hand side on line 2, 2, Fig. 1, Fig. 3 is a plan-view of the lower part of the pneumatic valve-action, the diaphragm being broken off to show the parts below, Fig. 4 is a detail front-view of the front-wall of my improved pneumatic valve-action, drawn on a larger scale and shown as detached from the remaining parts, and Fig. 5 is a detail vertical transverse section on line 5, 5, Fig. 3.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, *a* represents the supporting base-block of my improved pneu-

matic valve-action. To the under-side of the block are attached bellows *b* of the usual construction. The movable member of each bellows *b* is connected by a lifter *d* with the corresponding key-lever of the piano-player. Each bellows is connected by a channel with the valve-chamber *e* in which a double valve *e*¹, *e*² is arranged, both valves being attached to a valve-stem *f*, the lower end of which rests on a block *f*¹. Said block is attached to a diaphragm *f*¹ which rests on a concave seat *f*² in the usual manner in pneumatic valve-actions. The lower valve *e*¹ serves to close an opening in the valve-chamber *e* while the valve is in position of rest, while the upper valve *e*² serves to close an opening in the top-part of the valve-casing when the valve is lifted for exerting a suction action on the bellows.

A channel *g* connects the chamber which surrounds the diaphragm *f*¹ with the wind-chest, which is connected with the power-bellows for creating a suction action on the bellows and valve-chamber. The valve-chamber *e* is connected by an angular duct *e*² with the bellows *b*. In the seat *f*² for the diaphragm *f*¹ is arranged a duct *h* which is connected by a central opening *h*¹ with a space below the diaphragm *f*¹, said duct *h* being connected by a short tube *h*² with an elastic tube that connects the duct *h* with the corresponding opening in the tracker of the piano-player.

Sidewise of the induction-channel *h* is arranged in the diaphragm-seat a duct *i* which communicates at its front-end with a diaphragm *i*¹ having a small center opening *i*², said diaphragm being located in a circular recess *i*³ in the front-wall *a*¹ by which the diaphragm-chamber, which forms the lower part of the valve-action, is inclosed. The circular recess *i*³ is connected by a short lateral duct *i*⁴ with the duct *h*, as shown clearly in Figs. 2 and 3. The circular recess *i*³ is covered by an auxiliary closing-plate *p*, which is screwed by a screw *p*¹ to the front-wall *a*¹ of the valve-action, a packing of felt or other material being interposed between the front-wall and the auxiliary plate *p* so as to form a tight connection with the same. The front-wall *a*¹ of the valve-action is attached to the front-wall of the diaphragm-chamber by a retaining-screw *a*². By detaching the retaining screw *a*² the front-wall *a*¹ of the diaphragm-chamber can be removed, so that access is given to the interior of the diaphragm-cham-

ber and to the ducts i and i^4 for cleaning and repairing the parts. Each valve-action can thus be readily and individually examined and cleaned and tightened up when necessary.

The operation of my improved pneumatic valve-action is as follows: As soon as a perforation in the music-sheet passes over the opening in the tracker-channel atmospheric air pressure is established in the connecting-channel in the diaphragm-block, so that a suction in the diaphragm-chamber permits the quick lifting of the diaphragm and the opening of the valve e^1 and the closing of the valve-chamber by the valve e^2 . The suction which is exerted by the wind-chest on the diaphragm-chamber and bellows produces the instant collapsing of the bellows and the raising of the lifter and operation of the piano-action. As soon as the opening in the music-sheet has passed the opening in the tracker the air is cut off, so that the diaphragm would be slowly returned to its seat. To expedite the return of the diaphragm and valves to their normal position, the auxiliary duct is simultaneously called into action by the suction which is exerted on the underside of the diaphragm through the channels h , i^4 , perforation i^1 , recess i^3 and channel i^2 , and the diaphragm-chamber which is connected by the channel g with the wind-chest. As the opening i^2 is small the quick return of the diaphragm is retarded and the same returned slowly and without fluttering to its seat, the valve e^1 being then returned to its connecting-opening and thereby all the parts returned to normal position of rest. The atmospheric air being then exerted in the channel owing to the opening of the valve e^2 , the bellows is immediately expanded and returned with the lifter to its normal position. By the auxiliary duct the return motion of the diaphragm and valves is accomplished in a steady and reliable manner without counter-pressure on the diaphragm, so that the valve-actions function in a very reliable and effective manner, while by the use of the separate detachable covering-plate for the

diaphragm-chamber convenient access is given to the same, and thereby the entire valve-action kept in clean and effective condition for use.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a pneumatic valve-action, the combination, with the diaphragm-block provided with an inlet-channel, of a diaphragm on the same, a diaphragm-chamber, a valve-chamber connected by an opening with the diaphragm-chamber, a double valve supported on the diaphragm, one valve being used for opening and closing the valve-chamber and the other for closing the air-opening of the latter, an auxiliary duct located in the diaphragm-block and provided with a centrally perforated diaphragm, and a lateral duct connecting said perforated diaphragm with the inlet-duct of the diaphragm-block.

2. In a pneumatic valve-action, the combination of a diaphragm, a diaphragm-chamber, a diaphragm-block in the same, an air-inlet channel in said block, valves operated by the diaphragm, a valve-chamber for said valves connected with the wind-chest, a bellows connected with said valve-chamber, a detachable front-wall for the diaphragm-chamber, an auxiliary duct arranged in the diaphragm-block, a recess or depression having a perforated diaphragm located at the front-end of the auxiliary duct, a closing-plate for said diaphragm-depression, and a lateral channel connecting the diaphragm-depression with the inlet-duct in the diaphragm-block for permitting the return of the diaphragm and valves into normal position as soon as the corresponding opening in the tracker is closed.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

JOSEPH WIESER.

Witnesses:

PAUL GOEPEL,
HENRY J. SUHRBIER.