

No. 685,414.

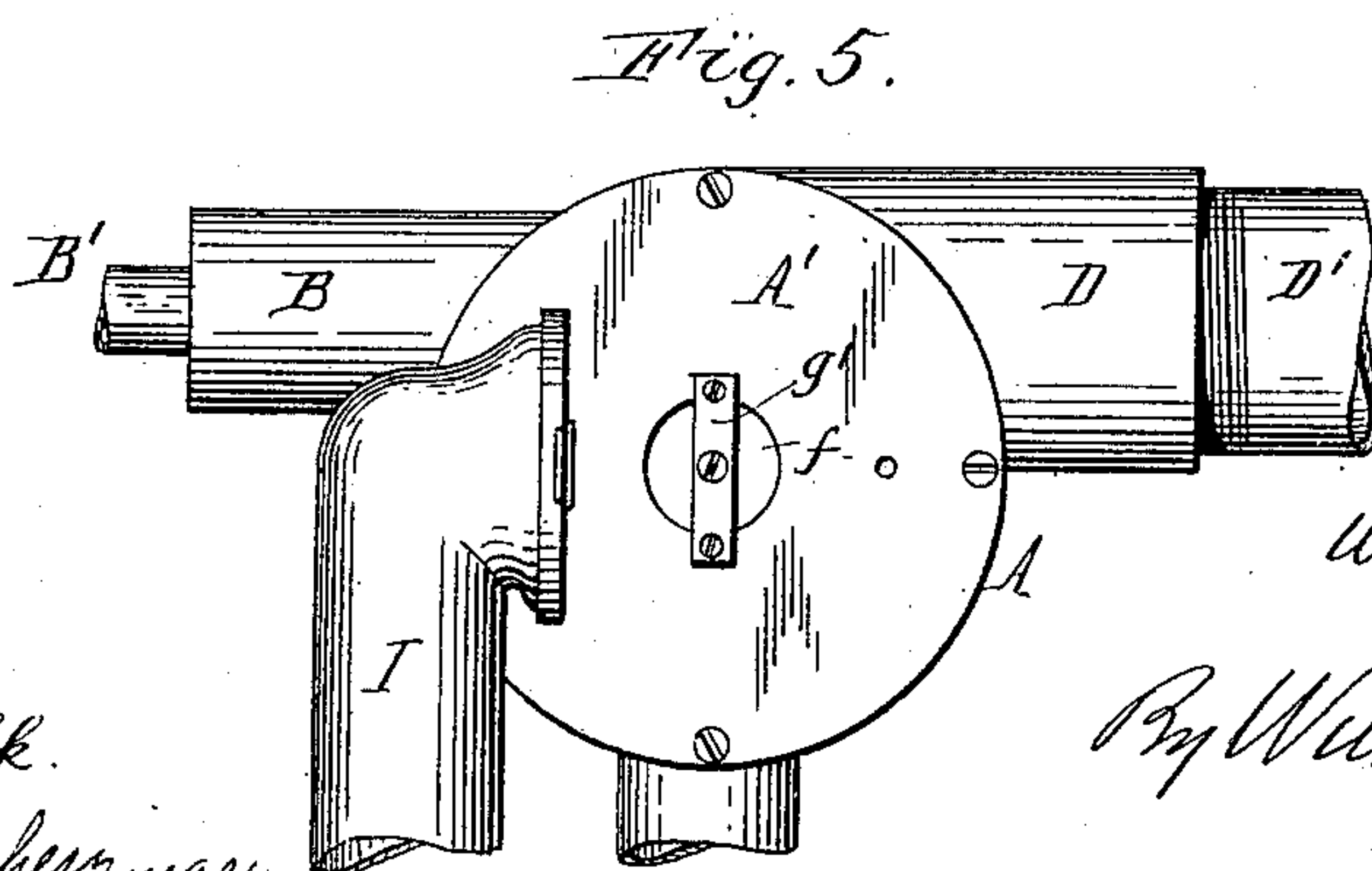
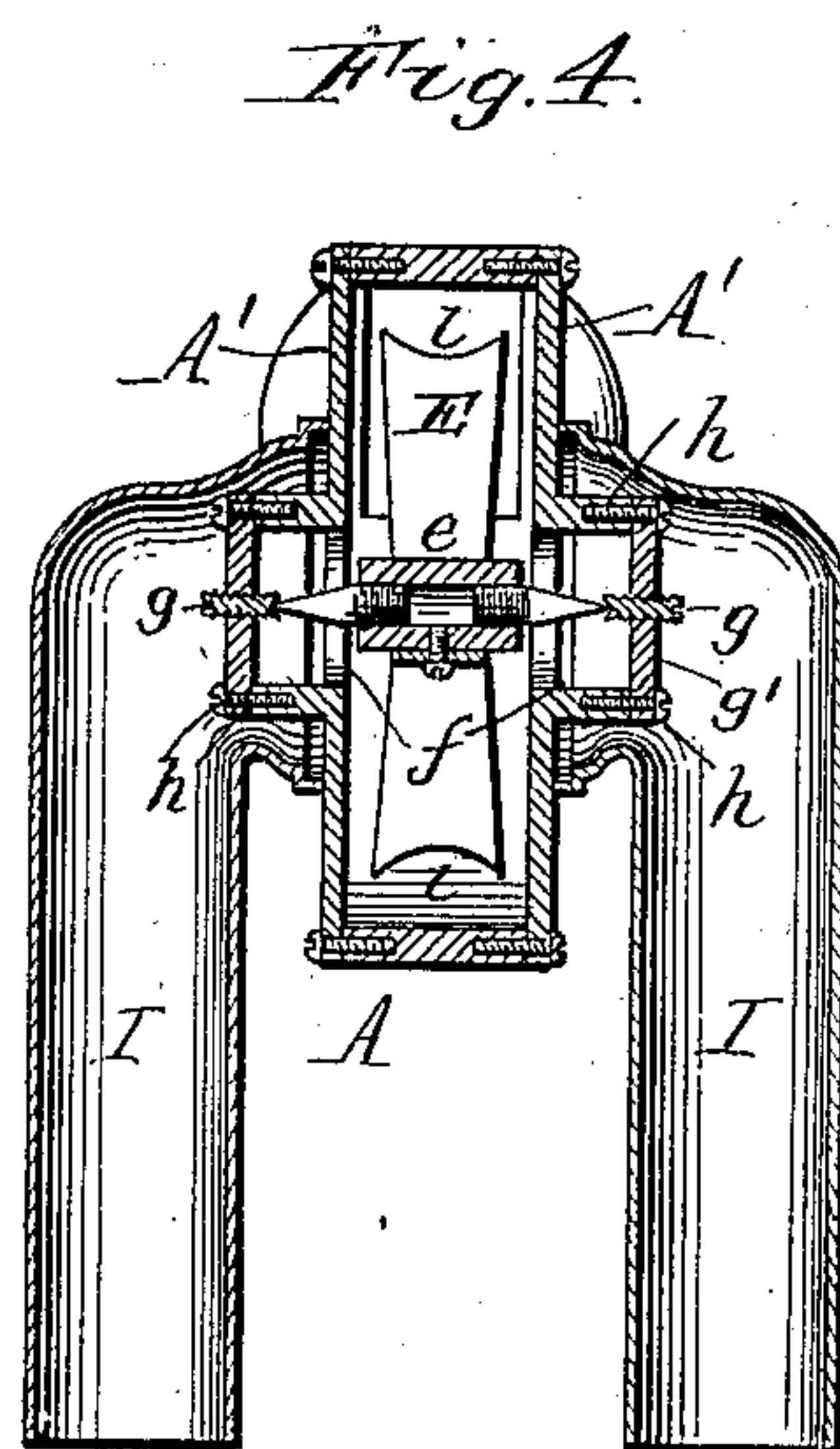
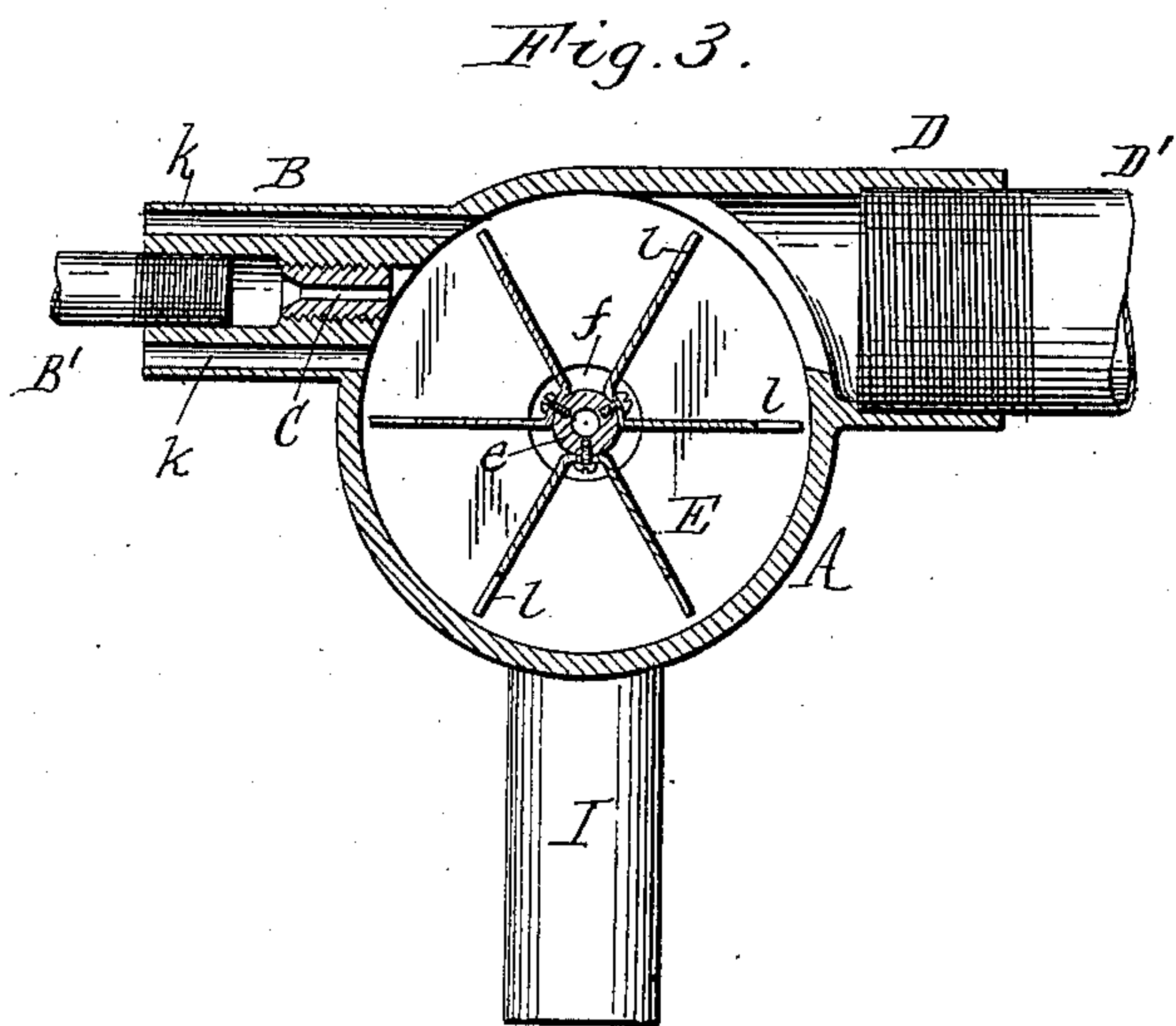
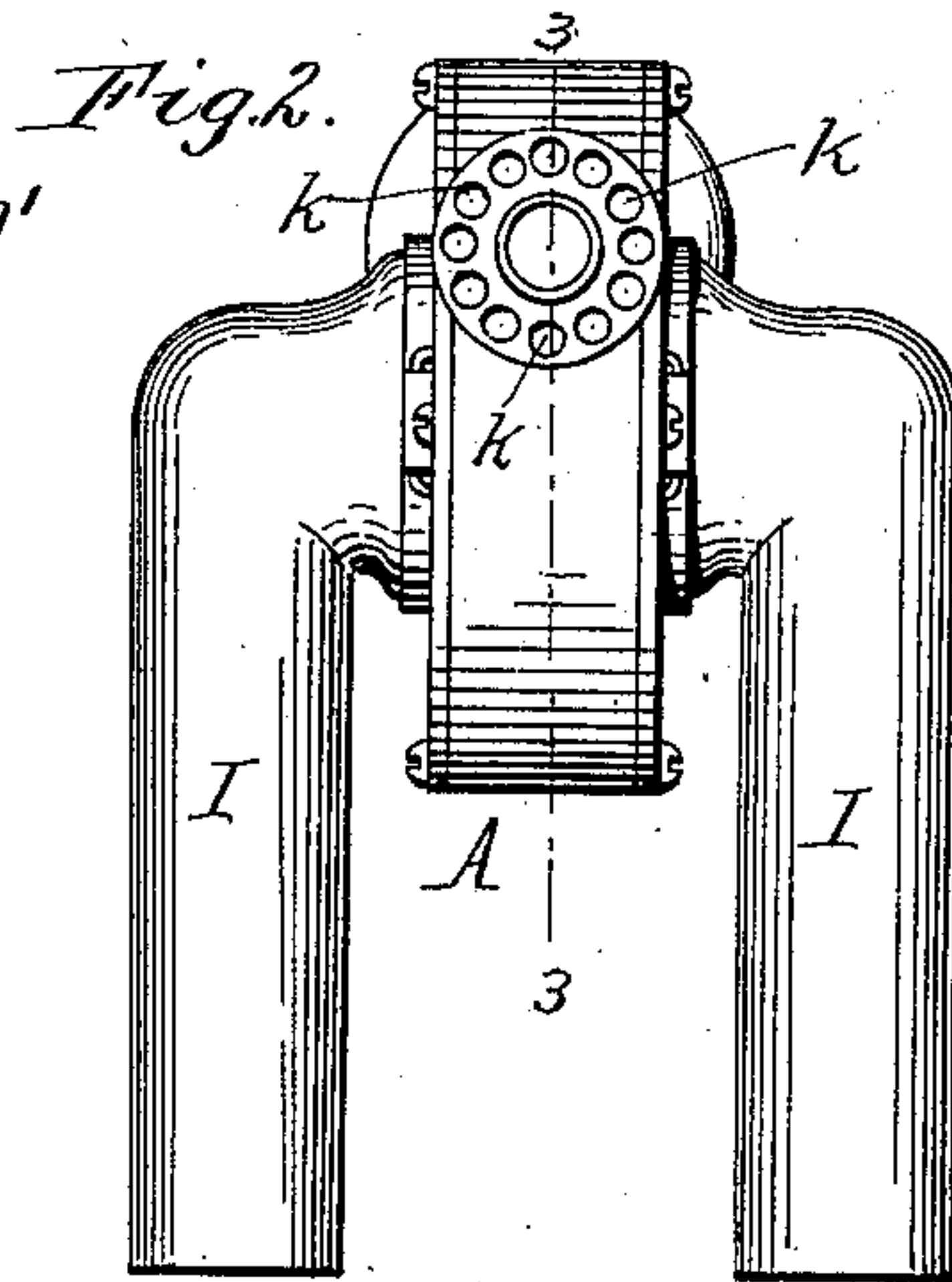
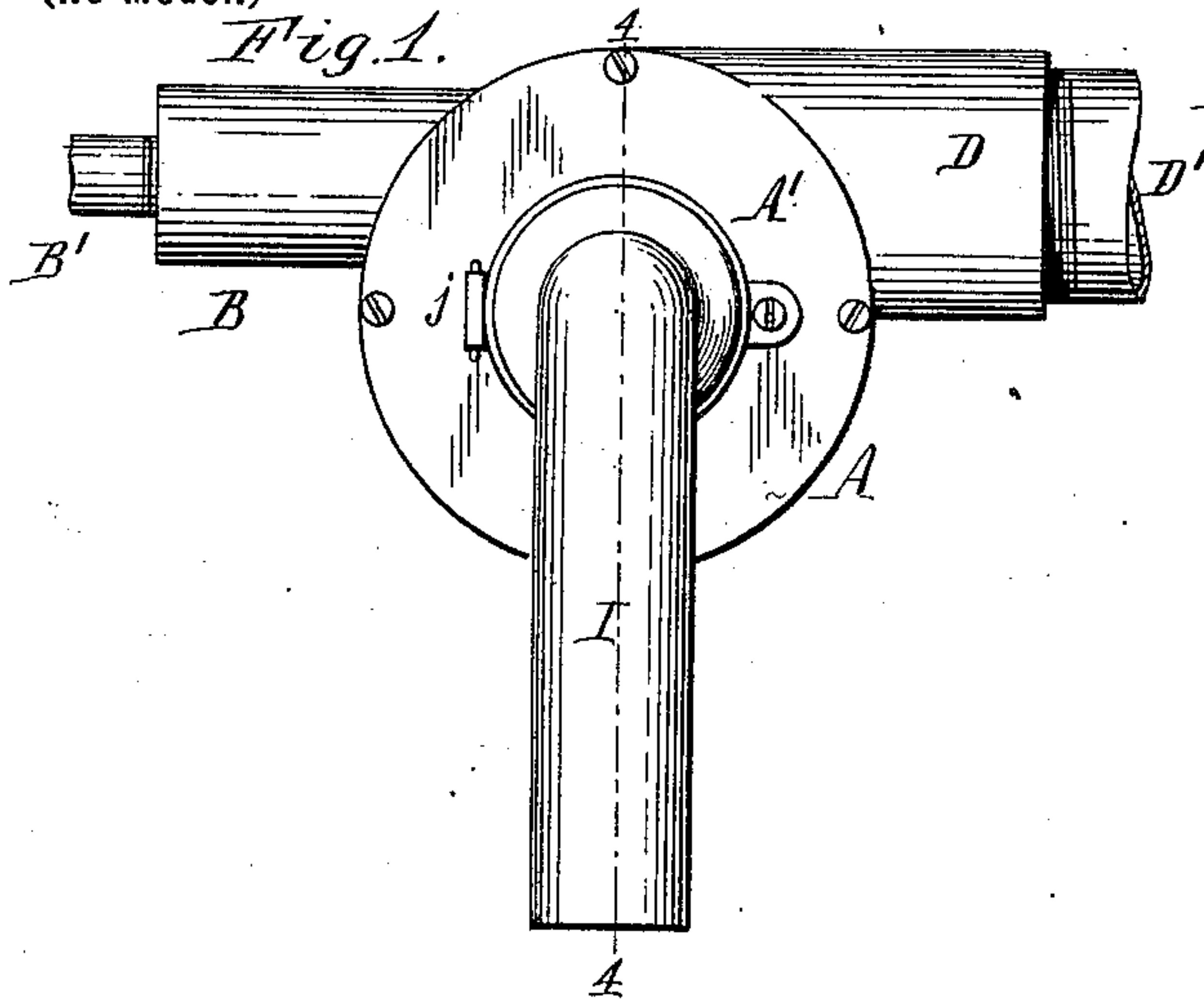
Patented Oct. 29, 1901.

F. L. STONE & W. A. STEVENS.

GAS AND AIR MIXER.

(Application filed June 18, 1900.)

(No Model.)



Witnesses:

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UNITED STATES PATENT OFFICE.

FRANK L. STONE AND WILLIAM ABEL STEVENS, OF FRANKLINVILLE,
NEW YORK.

GAS AND AIR MIXER.

SPECIFICATION forming part of Letters Patent No. 685,414, dated October 29, 1901.

Application filed June 18, 1900. Serial No. 20,653. (No model.)

To all whom it may concern:

Be it known that we, FRANK L. STONE and WILLIAM ABEL STEVENS, citizens of the United States, residents of Franklinville, in the county of Cattaraugus and State of New York, have invented new and useful Improvements in Gas and Air Mixers, of which the following is a specification.

This invention relates to gas and air mixers, and more particularly to a mixer comprising a cylindrical mixing-chamber provided at one side with a tangential inlet for natural or other gas and at its opposite side with an outlet for the mixed gas and air and a rotary fan or agitator for mixing the gas and air, which is arranged in said chamber and driven by the gas-jet entering the same.

The objects of our invention are to provide the mixer with improved air-inlets for insuring the supply of cold air thereto and to facilitate access to its interior for adjusting the bearings of the fan-shaft.

In the accompanying drawings, Figure 1 is a side elevation of our improved mixer. Fig. 2 is a front view thereof. Fig. 3 is a vertical longitudinal section of the same in line 3 3, Fig. 2. Fig. 4 is a transverse section thereof in line 4 4, Fig. 1. Fig. 5 is a fragmentary side elevation showing one of the air-inlet tubes swung aside to expose the adjacent eye of the mixing case or chamber.

Like letters of reference refer to like parts in the several figures.

A is the cylindrical casing or chamber of the mixer, which is closed at its sides or ends by heads A' and provided at its front side near its top with a tangential inlet branch B, which is screw-threaded for connection with a gas-supply pipe B'. This inlet branch opens into the chamber of the casing and is provided in its inner portion with a jet-nozzle C, which is preferably removably secured in the bore thereof by a screw-thread, so that a nozzle with a different-sized bore may be substituted for the same, if desired.

D is the outlet or delivery branch of the mixer, which is arranged at the side thereof opposite the inlet branch B and connected with a pipe D', leading to the gas-burner. This outlet branch is of greater area than the inlet branch B and is located substantially

in line therewith, so that the incoming-gas jet passes directly from the inlet branch to the outlet branch.

E is the fan or agitator, arranged in the mixing-chamber, and *e* its shaft or journals, which extend through eyes or air-inlet openings *f*, formed axially in the sides of the casing and which turn in adjustable bearing-screws *g*. These screws are supported in cross-bars *g'*, secured at their ends to lugs *h*, which project from the side walls of the case on diametrically opposite sides of the eyes *f*, as shown in Fig. 4. The blades of the fan extend into the path of the gas-jet issuing from the nozzle C, so that the fan is rapidly rotated by the jet.

I represents depending air-inlet pipes or tubes communicating at their upper ends with the eyes or air-inlets *f* of the casing and extending outwardly and downwardly therefrom. These tubes are open to the atmosphere at their lower ends and terminate near the floor of the room, so as to supply cold air to the mixer. These tubes may be permanently secured to the mixer-case; but their bell-shaped upper ends are preferably hinged at one side to the case, as shown at *j*, and secured to the case at their opposite sides by screws or other removable fastenings, so that upon removing these screws the tubes can be swung outwardly on one side of the eyes *f* to afford access to the bearings of the fan-shaft for adjusting the same.

k represents longitudinal air-inlet ducts or passages formed in the inlet branch B outside of its main gas-passage and leading from the outer end of said branch to the interior of the mixing-chamber. These passages admit air to the chamber in rear of the rotary fan and prevent the formation of a vacuum, which would interfere with the action of the fan.

The fan-blades extend outwardly in close proximity to the periphery of the mixer-chamber, and in order to permit the gas to pass freely from the inlet to the outlet branch in case the fan should become bound from any cause the fan-blades are provided in their outer ends with recesses or gas-passages *l*.

In the use of the mixer the gas-jet project-

ed into the case impinges against the fan-blades and turns the same at a greater or less speed, according to the gas-pressure. The suction produced by the fan and the gas-jet draws the external air through the air-tubes I and eyes *f* into the mixer-chamber, the gas and air being thoroughly commingled by the rotating fan-blades and forced by the latter through the delivery branch to the gas-burner. The fan rotates at a high or low speed, according to the gas-pressure or the extent to which the gas is turned on, and the volume of air drawn into the mixer is correspondingly greater or less, thus rendering the mixer practically self-regulating at any gas-pressure. For this purpose the tubes I and the openings in the sides of the mixing-chamber are unobstructed and of the proper size to admit the maximum volume of air.

Should the flow of gas cease while the same is turned on, the rapidly-rotating fan continues to run for a short time after the flow stops, thereby continuing to draw air into the mixer-chamber through the tubes I and blowing all the gas out of the burner and preventing the flame from flashing back. In case the gas should again begin to flow there is no flame to ignite it, thereby avoiding an explosion, which would otherwise be liable to occur. The depending air-inlet tubes I by extending some distance below the mixing-chamber also prevent the gas from escaping into the room in case the fan should become bound by rust or from any other cause, and they also serve as guards or housings for protecting the bearings of the fan-shaft.

We claim as our invention—

1. In a gas and air mixer, the combination with the mixing chamber or case, provided with inlet and outlet branches or passages and having an air-inlet in its side, an air-inlet tube extending downwardly from said air-inlet and having its upper end hinged to the case at one side and detachably secured to the case at its opposite side, and a fan journaled in said case and arranged to be driven by the gas entering the same, substantially as set forth.

2. In a gas and air mixer, the combination with the mixing chamber or case having a gas-inlet branch provided outside of its main passage with air-inlet passages which communicate with the interior of the case, said case being provided opposite said inlet branch with an outlet branch for the mixed gas and air, and a fan journaled in said case and arranged to be driven by the gas entering the same, substantially as set forth.

3. In a gas and air mixer, the combination with the mixing chamber or case having inlet and outlet branches or passages and provided in its sides with axial air-inlet openings, of supporting-bars extending across said openings, shaft-bearings carried by said bars, and a fan arranged in said case and journaled in said bearings, substantially as set forth.

4. In a gas and air mixer, the combination with the mixing chamber or case having inlet and outlet branches or passages and provided in its sides with axial air-inlet openings, of supporting-bars extending across said openings, shaft-bearings carried by said bars, a fan arranged in said case and journaled in said bearings and depending air-inlet tubes connected with said air-inlet openings and having their upper ends hinged to the case, whereby said tubes can be swung aside for exposing said bearings, substantially as set forth.

5. A gas-mixer composed of a cylindrical mixing-chamber, a gas-supply nozzle, and a discharge-nozzle situated on the peripheral edge of said chamber and connected thereto, and air-inlet openings situated in advance and to the rear of said gas-nozzle and extending transversely across the periphery of said chamber, substantially as set forth.

Witness our hands this 2d day of June, 1900.

FRANK L. STONE.
WILLIAM ABEL STEVENS.

Witnesses:

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