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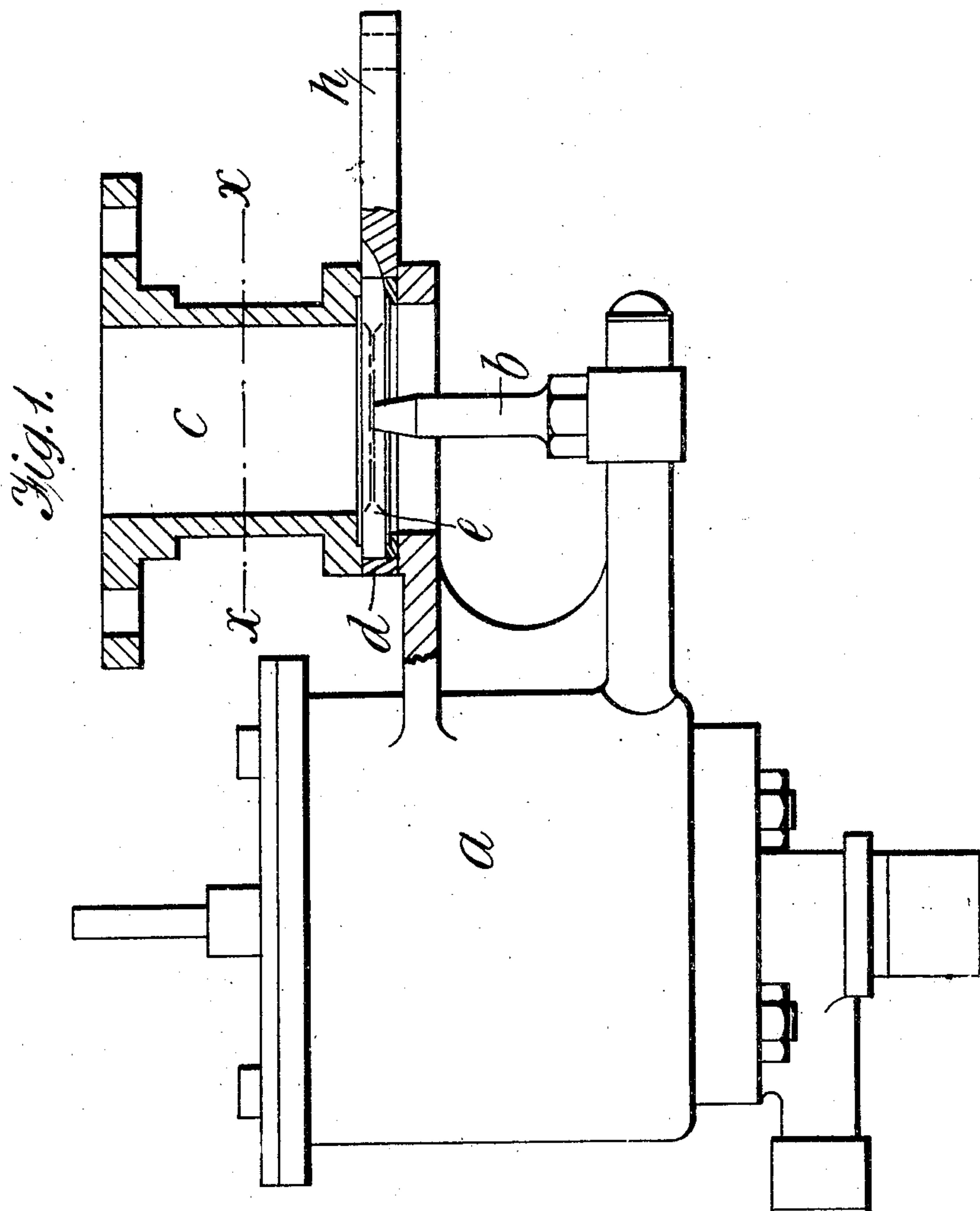
PATENTED MAR. 10, 1908.

S. A. HORSTMANN.

CARBURETER FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED DEC. 3, 1906.

4 SHEETS—SHEET 1.



Witnesses.

Tercy M. Goodwin

Robt. Hunter

Inventor.

Sidney Adolph Horstmann

by his Attorney

Benj. V. King

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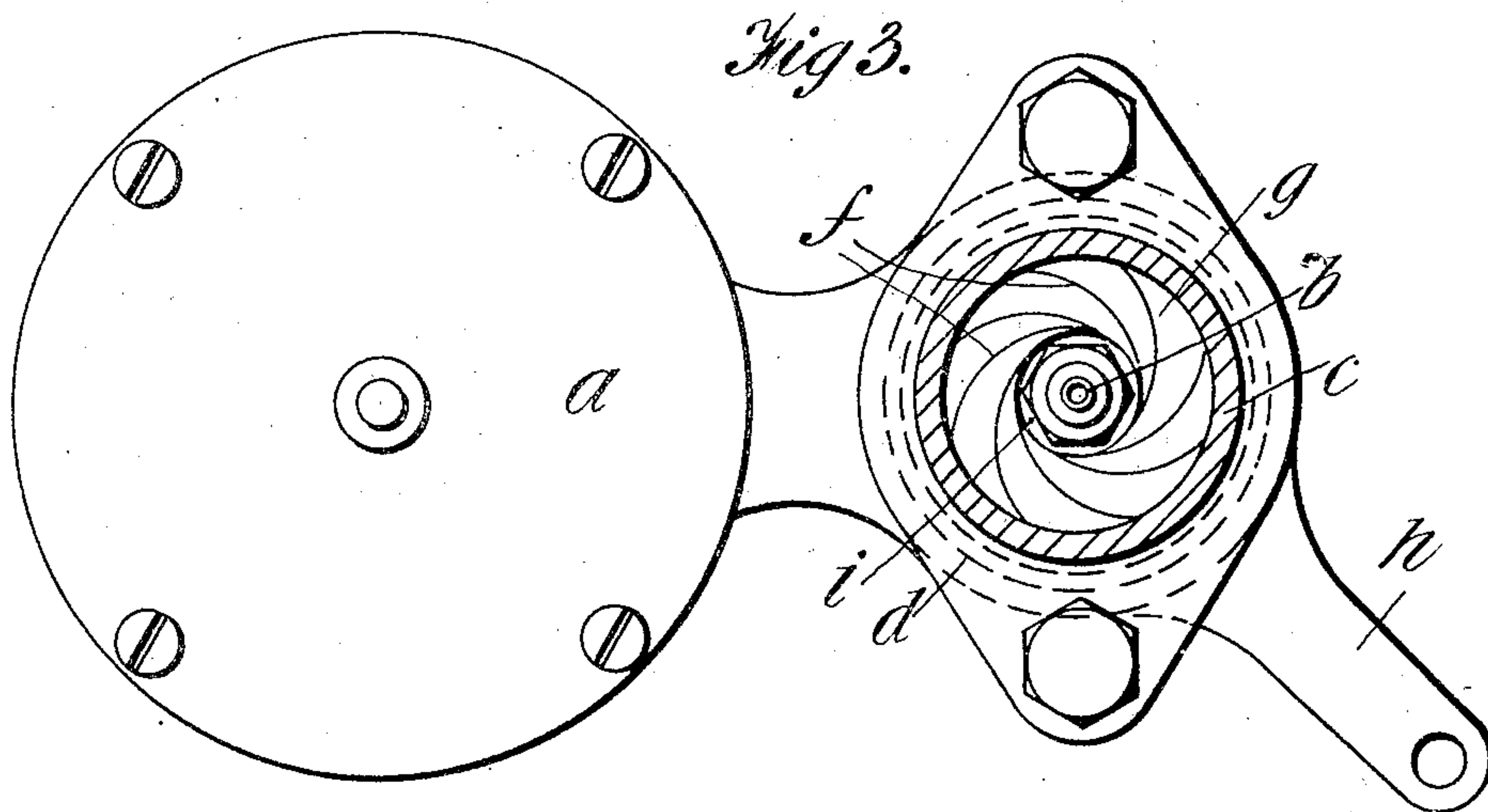
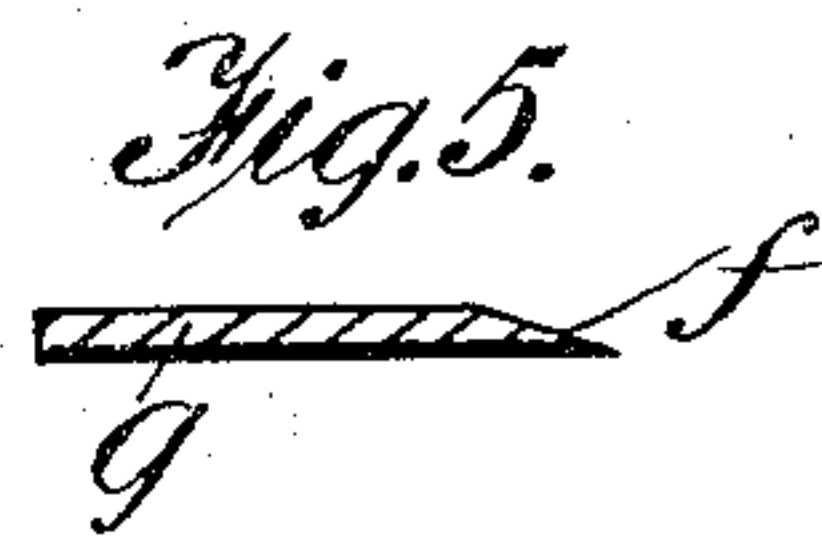
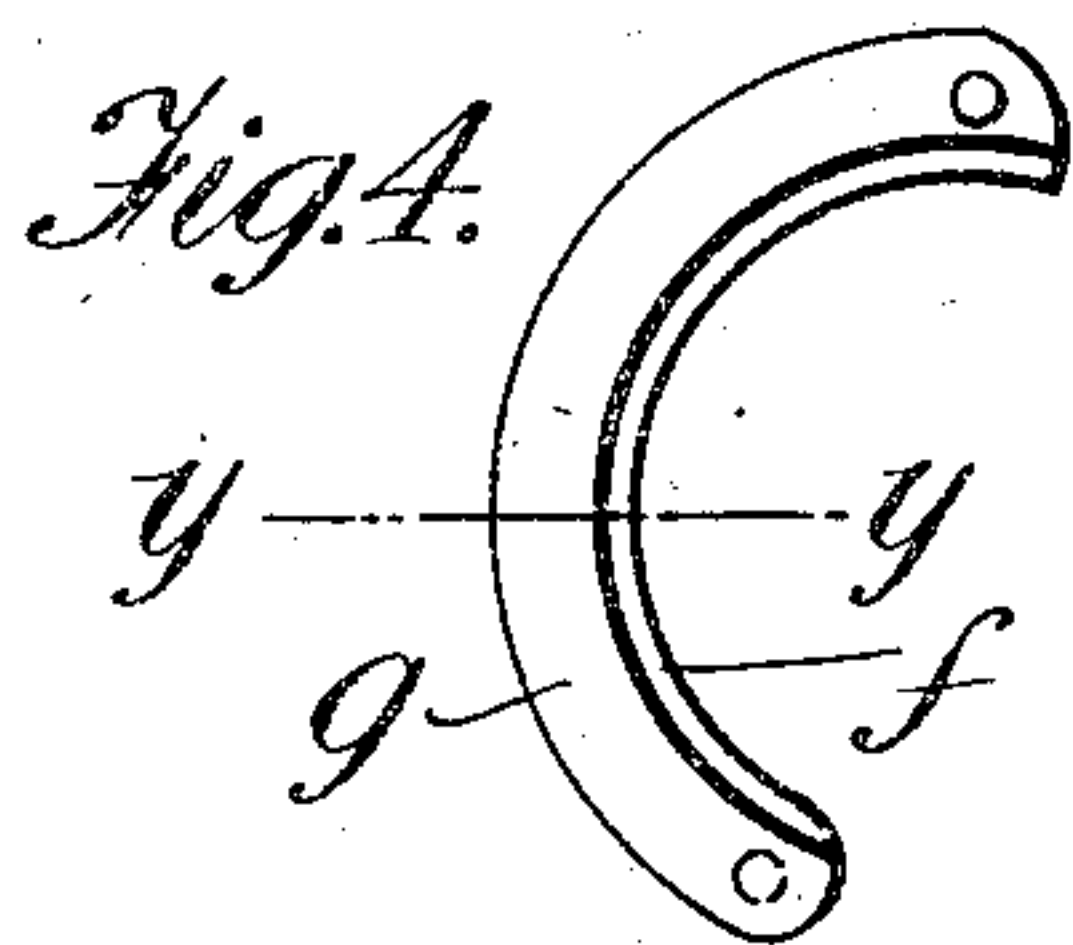
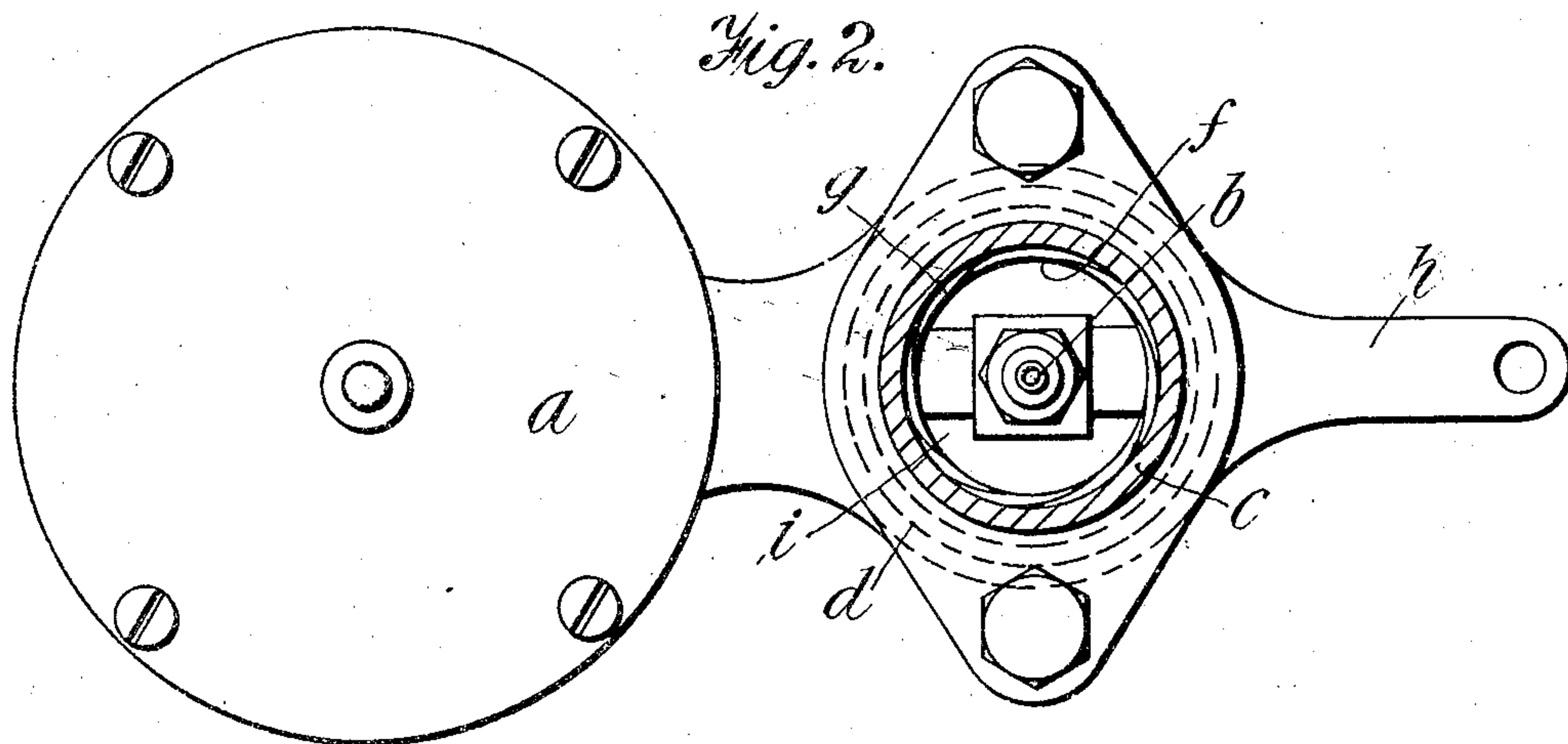
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4 SHEETS—SHEET 2.



Witnesses.
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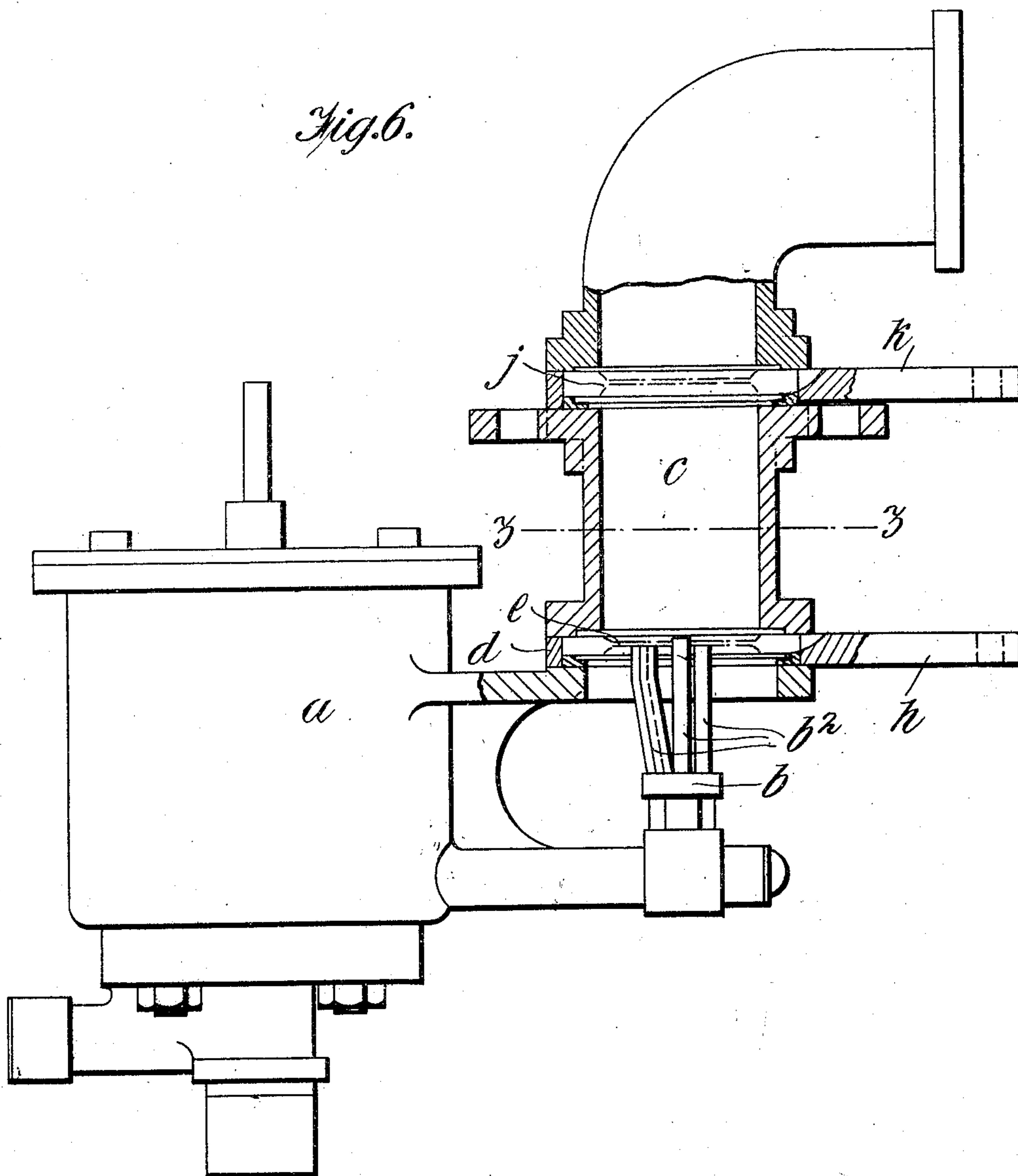
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4 SHEETS—SHEET 3.

Fig. 6.



Witnesses.

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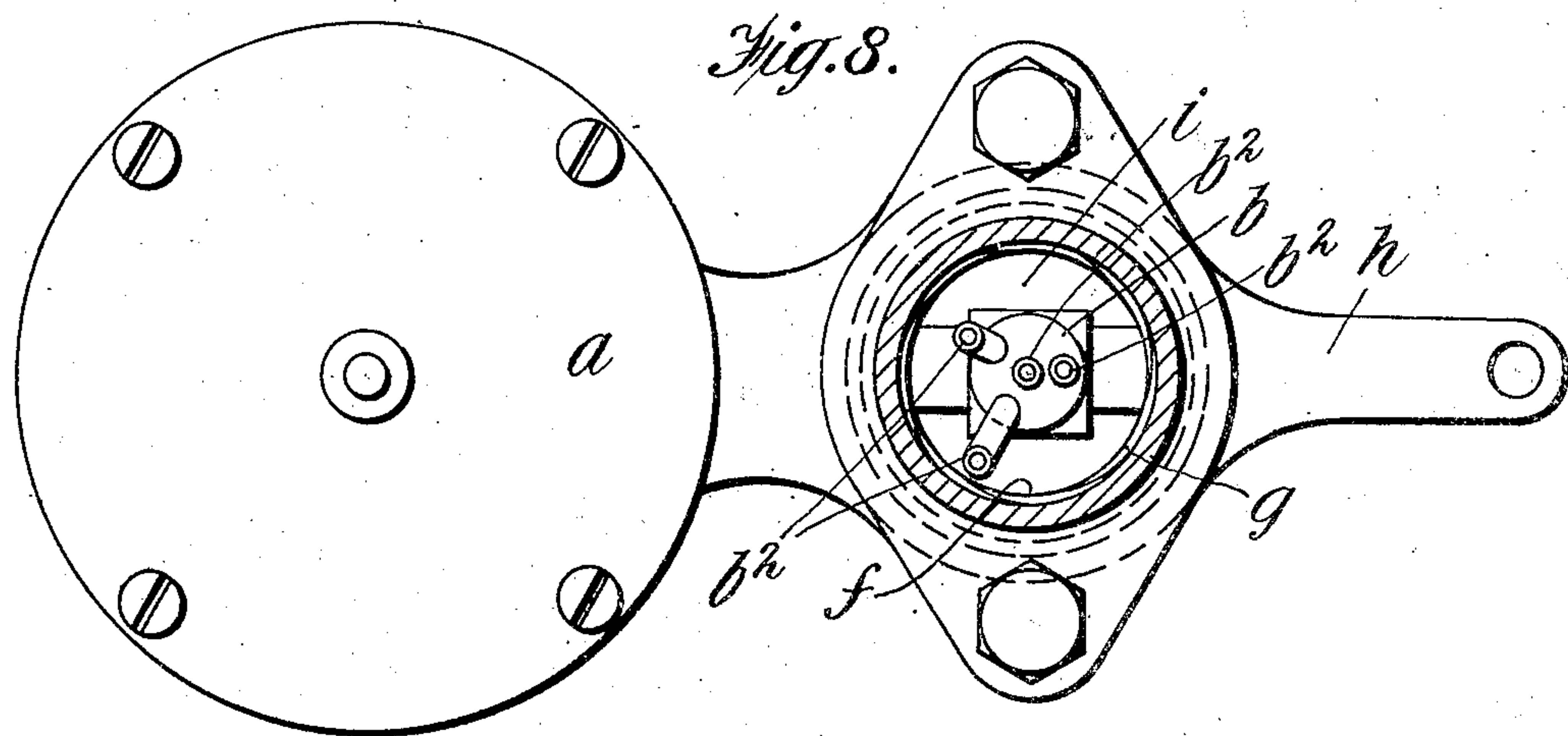
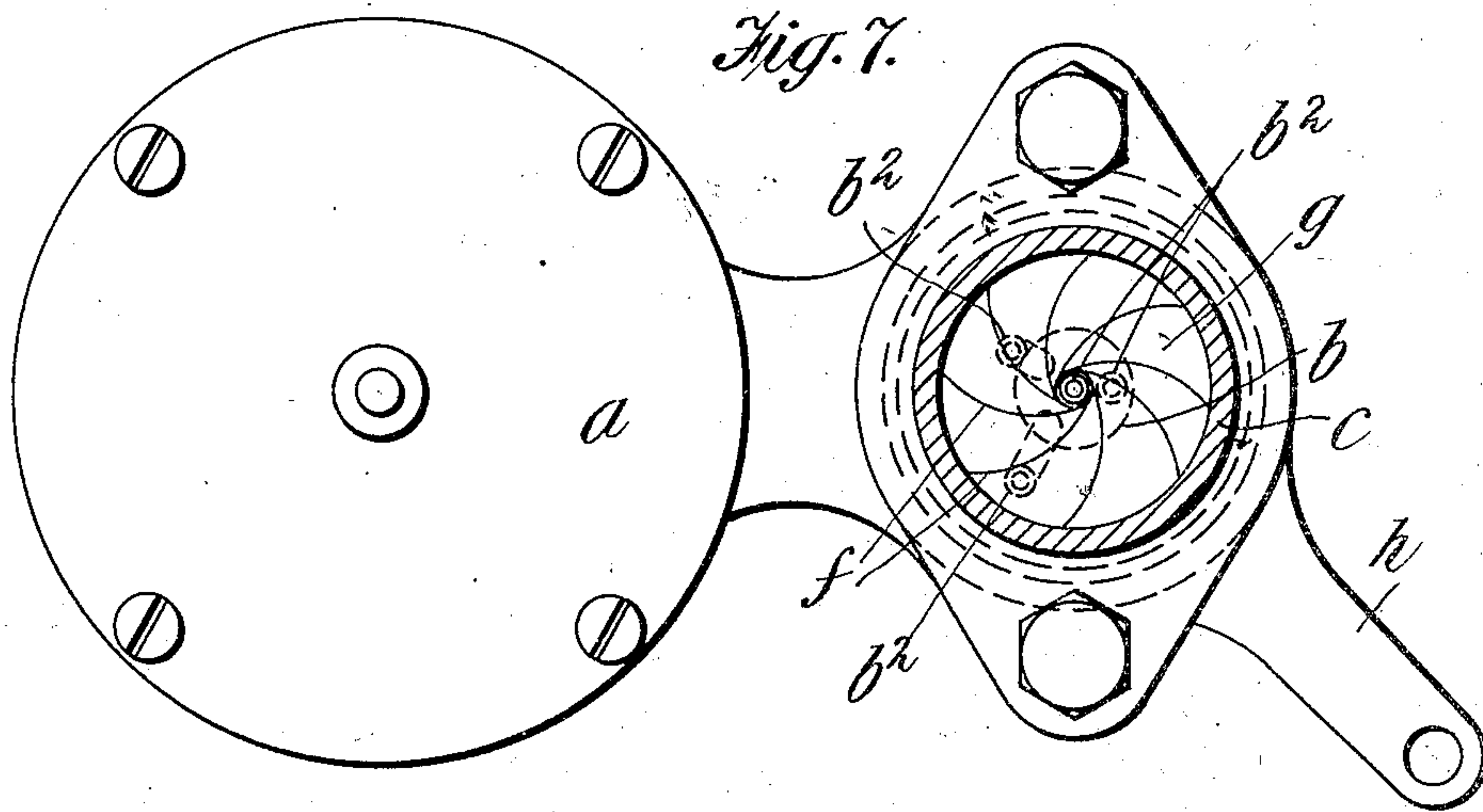
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CARBURETER FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED DEC. 3, 1906.

4 SHEETS—SHEET 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

SIDNEY ADOLPH HORSTMANN, OF BATH, ENGLAND, ASSIGNOR OF ONE-SIXTH TO ALBERT HORSTMANN, ONE-SIXTH TO GUSTAV OTTO HENRY HORSTMANN, ONE-SIXTH TO ERNST HERMANN HORSTMANN, ONE-SIXTH TO WILLIAM THOMSON EDGAR, OF BATH, ENGLAND, AND ONE-SIXTH TO R. A. LISTER & COMPANY, LIMITED, OF DURSLEY, ENGLAND.

CARBURETER FOR INTERNAL-COMBUSTION ENGINES.

No. 881,800.

Specification of Letters Patent.

Patented March 10, 1908.

Application filed December 3, 1906. Serial No. 348,140.

To all whom it may concern:

Be it known that I, SIDNEY ADOLPH HORSTMANN, a subject of the King of Great Britain and Ireland, and resident of 13 Norfolk Crescent, Bath, county of Somerset, England, have invented certain new and useful Improvements in Carbureters for Internal-Combustion Engines, of which the following is a specification.

10 This invention of improvements in carbureters for internal combustion engines has for its object to provide for efficiently vaporizing petroleum spirit, alcohol and the like used in such engines, by regulating the size of an orifice around the jet of an ordinary carbureter, thus obtaining more or less suction at jet and a required mixture of gas and air.

For this purpose the said invention consists essentially in the adaptation to the inlet pipe of an engine of an iris diaphragm (the inner edges of the blades or fins of which are keen or thinned down) in combination with a single or compound jet and with or without a throttle.

25 In practice the diaphragm is arranged at the lower part of the inlet pipe to the engine and close to the top of the jet or jets which may be carried by the float feed chamber and is or are arranged below said diaphragm.

30 The jet when a compound one is used consists as a whole of a series of small nozzles or jets, one of which is placed in or near the center of the orifice of the diaphragm and by preference extends through the same, the others being arranged at varying distances from center of said orifice or diaphragm and below the same so that more or less jets can be successively brought into or out of active work by increasing or diminishing the size of the orifice or diaphragm as required. This device in practice also forms an effective throttle provided the jets are suitably arranged, or for the same purpose (throttling) an iris diaphragm or other known form of throttle may be arranged at a slight distance above the first named orifice or diaphragm, said throttle being so disposed that one lever actuates them conjointly at ratios varying or otherwise. If desired, however, a throttle may be used separately and independently.

50 In order that the said invention may be clearly understood reference is to be had to

the following description and accompanying sheets of drawings in which:—

Figure 1 is a part sectional elevation of an apparatus constructed in accordance with this invention illustrating the application of the same in combination with a single jet or nozzle; Fig. 2 is a section on line *x, x*, Fig. 1, orifice of diaphragm open; Fig. 3 a view similar to Fig. 2 but with orifice of diaphragm partially closed; Figs. 4 and 5 represent detail views of one of the blades or fins of the diaphragm, Fig. 5 being a section to an enlarged scale on line *y, y*, Fig. 4; Fig. 6 is a part sectional elevation illustrating the application of the apparatus in combination with a compound jet or nozzle; Fig. 7 represents a sectional view on line *z, z* of Fig. 6 with orifice of diaphragm at maximum closure; and, Fig. 8 a view similar to Fig. 7 but with orifice of diaphragm at maximum opening.

Like letters of reference indicate corresponding parts in the several figures.

Referring to the drawings, *a* is the float feed chamber and *b* the jet which may be a single jet as in Figs. 1 to 3 or a compound jet as in Figs. 6 to 8, carried thereby and *c* the inlet tube to the engine said inlet tube being the mixing chamber of the carbureter. Located at the lower end of the inlet tube and within a loose ring *d* is arranged an iris diaphragm *e* of ordinary construction with the exception that the inner edges *f* of its leaves, plates or fins *g* are keen, thinned or beveled as shown in Figs. 4 and 5, said loose ring *d* being operated by the handle or lever *h* to increase or diminish the opening or orifice *i* formed by the leaves of the diaphragm for the purpose of controlling the passage of air therethrough, said leaves or fins *g* owing to their keenness or thinness vibrating and thereby atomizing the fuel, thus promoting efficient vaporization. In Figs. 1, 2, 6 and 8 the diaphragm is shown with the maximum amount of opening, in Fig. 3 partly closed, and in Fig. 7 with the maximum closure, so that operating the same either by hand or by means directly connected to the engine governor more or less suction at jet or jets and the required mixture of gas and air is obtained, said mixture being throttled or not as required in any suitable manner.

When a compound jet or nozzle *b* is employed, Figs. 6 to 8, the same consists of a series of small jets or pipes *b*² (which may if desired be bent at the top at right angles or provided with a side opening at top), one of said jets *b*² being by preference centrally arranged and the others at varying distances therefrom so that all or any of the jets can be brought into or put out of action by increasing or diminishing the size of the opening of the diaphragm by operating the lever *h*, the vibration of the thin or keen inner edge of the diaphragm caused by the passage of air past the same atomizing the fuel, thus promoting efficient vaporizing, any number of jets being used according to requirements.

To effect the throttling of the fuel a second iris diaphragm *j* shown in Fig. 6 and operated by lever or handle *k* is arranged in the inlet tube *c* and at a slight distance above the diaphragm *e*, their respective levers or handles *k* and *h* being connected up so that one lever may actuate them conjointly at ratios varying or otherwise. In place of the diaphragm *j* any of the known forms of throttle may be employed and operated in conjunction with the diaphragm *e*, or if desired a throttle may be used separately and independently.

Having now described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. In a carbureter for internal combustion engines, the combination with a mixing chamber, of an iris diaphragm arranged in

the lower part of said mixing chamber and having the inner edges of its leaves thinned so that the vibrations of the same caused by the passage of air atomizes the fuel.

2. In a carbureter for internal combustion engines, the combination with a mixing chamber, of an iris diaphragm and an operating lever arranged at the lower end of said mixing chamber, and a compound nozzle formed of a series of small nozzles so disposed that the said small nozzles may be successively brought into action or put out of action by operating said iris diaphragm.

3. In a carbureter for internal combustion engines, the combination with a compound nozzle formed of a series of small nozzles, of an iris diaphragm provided with leaves thinned at their inner edges and arranged to vibrate under the passage of the air.

4. In a carbureter for internal combustion engines, the combination with a mixing chamber, an iris diaphragm arranged in said mixing chamber and provided with leaves the inner edges of which are thinned, and a nozzle; of an additional throttle arranged in the mixing chamber above the said iris diaphragm, and means for operating said diaphragm and throttle.

In testimony whereof I have affixed my signature in presence of two witnesses.

SIDNEY ADOLPH HORSTMANN.

Witnesses:

HILDA GARRETT,
WILLIAM SMITH.