

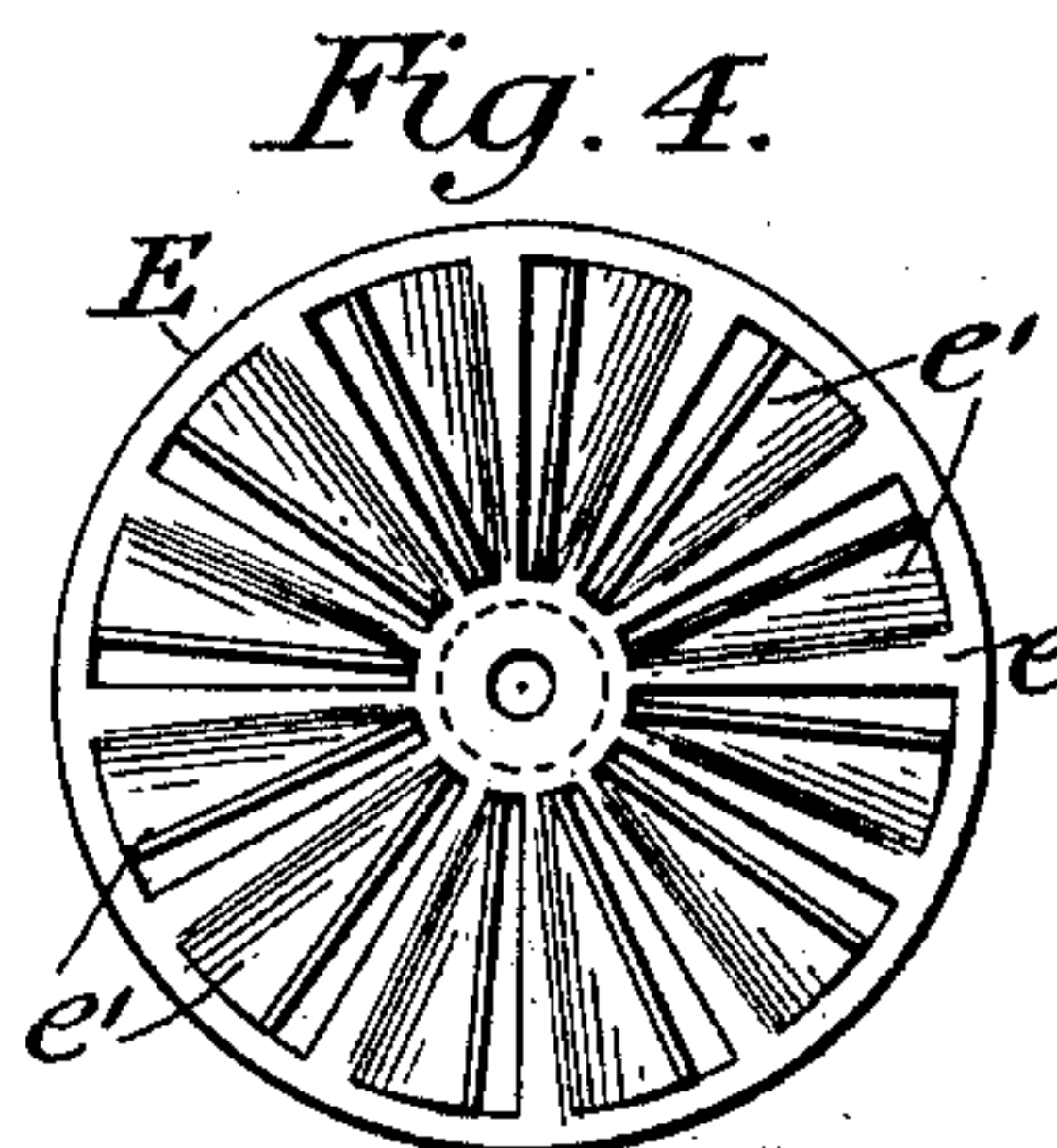
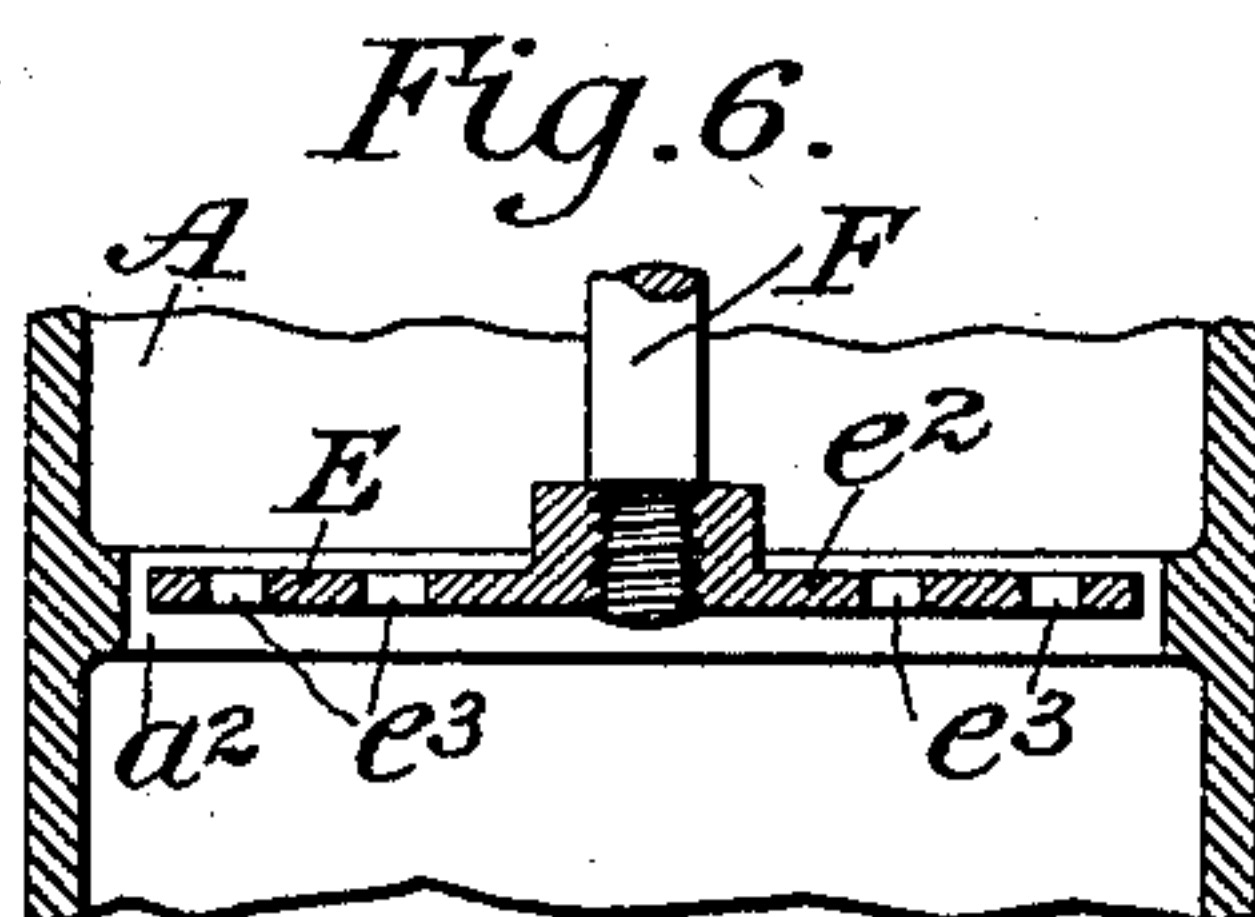
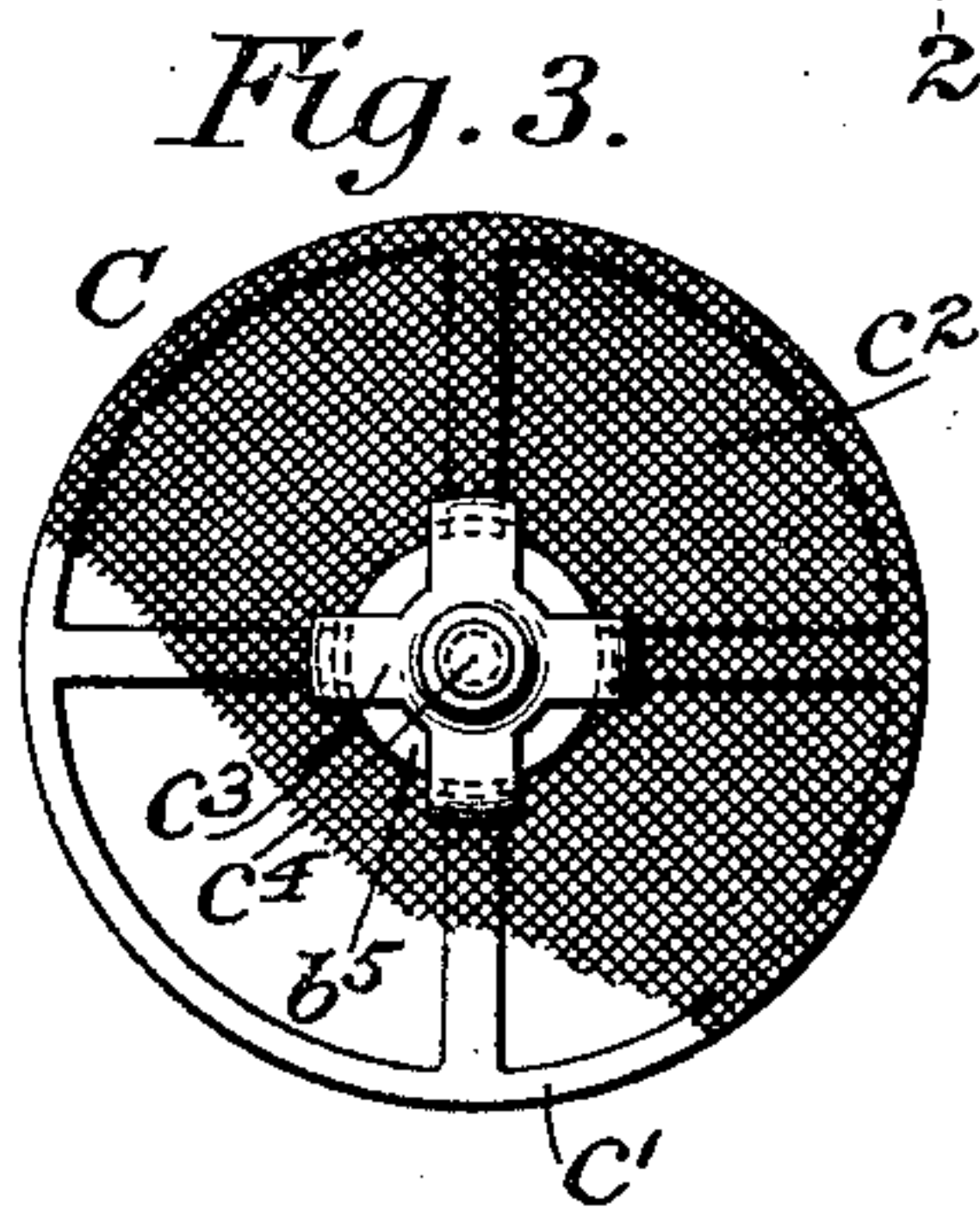
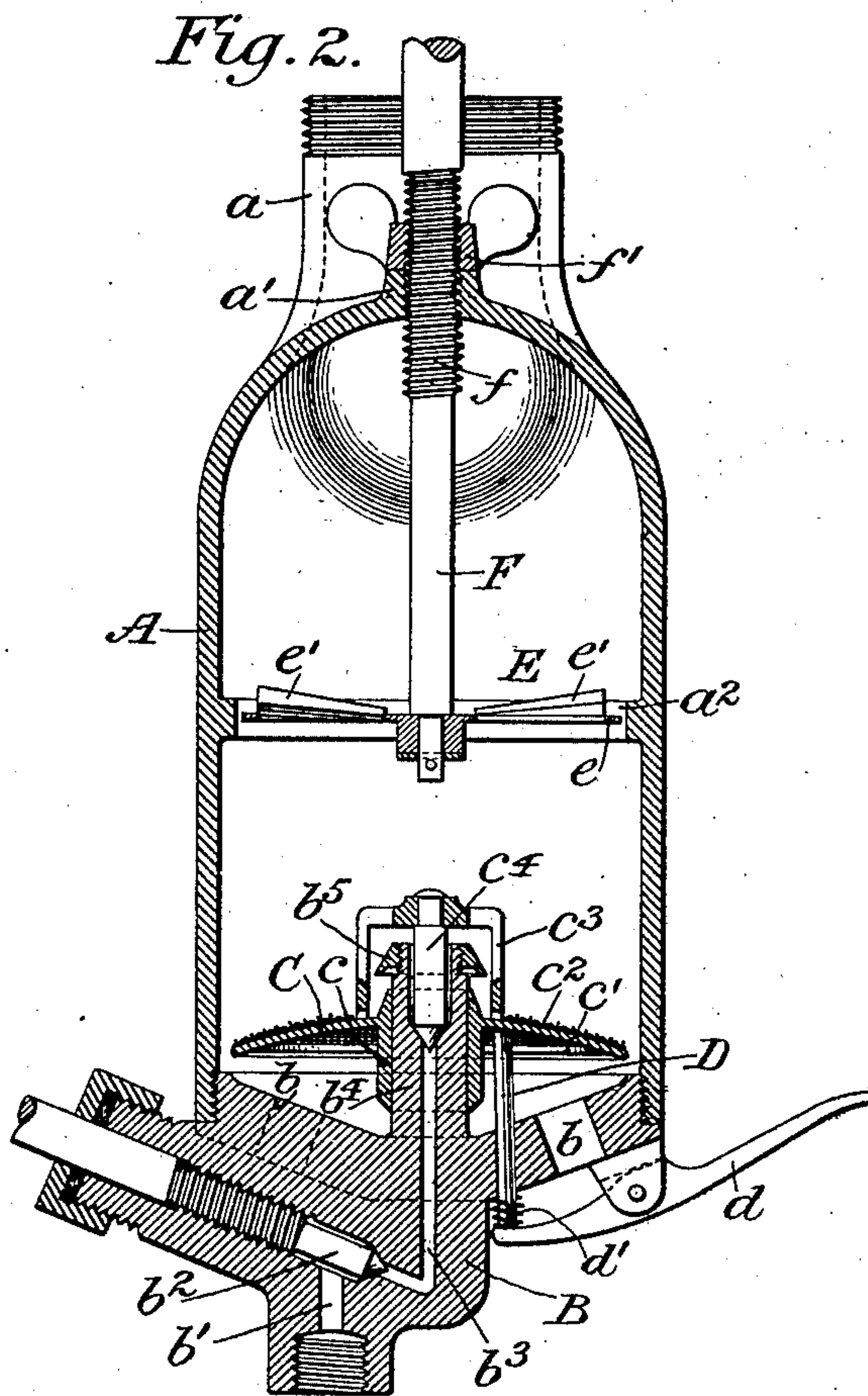
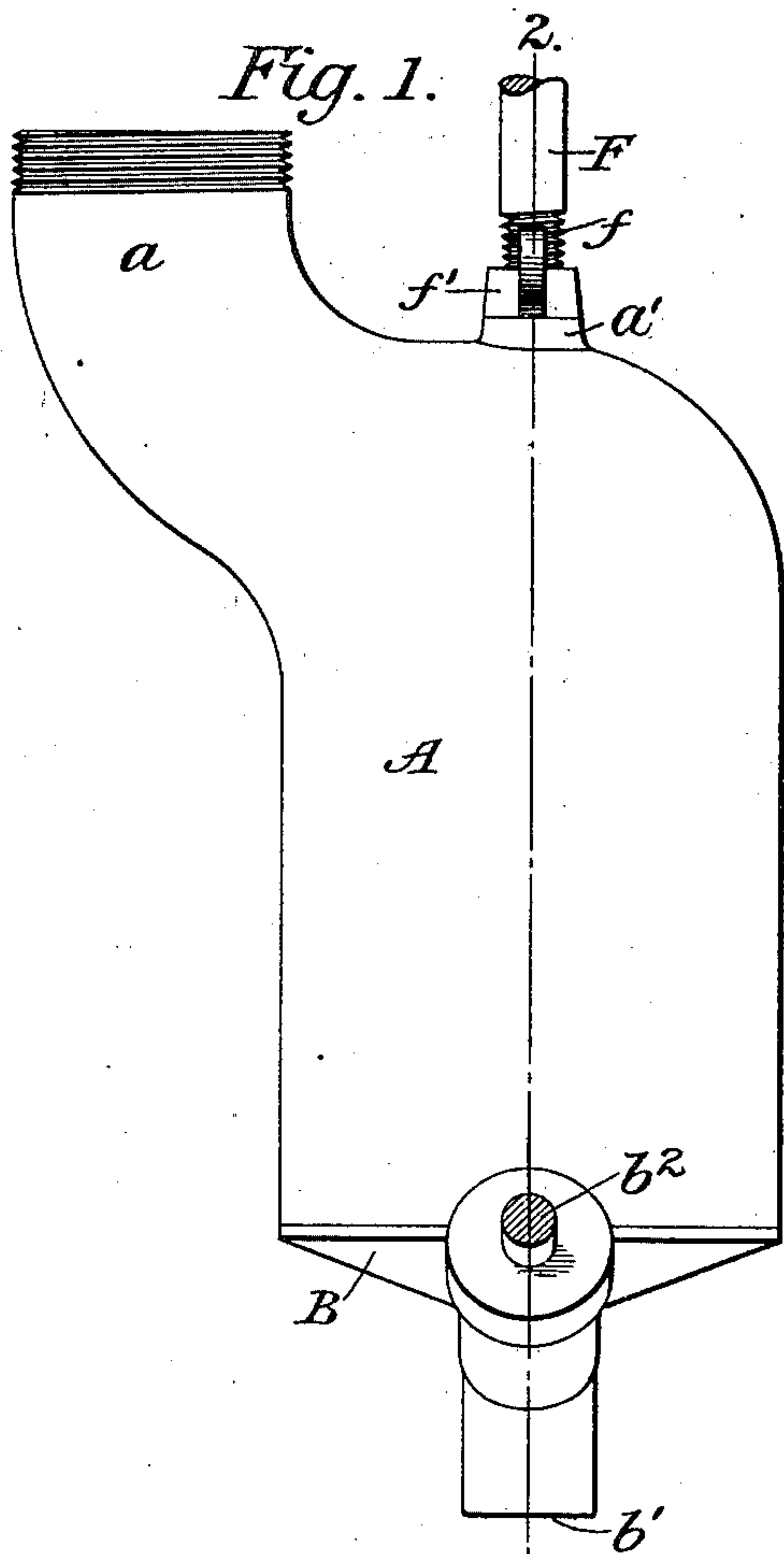
No. 692,444.

Patented Feb. 4, 1902.

N. G. HARRIS.
CARBURETER FOR EXPLOSION ENGINES.

(Application filed July 27, 1901.)

(No Model.)



Attest:

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UNITED STATES PATENT OFFICE.

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CARBURETER FOR EXPLOSION-ENGINES.

SPECIFICATION forming part of Letters Patent No. 692,444, dated February 4, 1902.

Application filed July 27, 1901. Serial No. 69,922. (No model.)

To all whom it may concern:

Be it known that I, NELSON G. HARRIS, a citizen of the United States, whose residence and post-office address is Chicago, county of Cook, State of Illinois, have invented certain new and useful Improvements in Carbureters for Explosion-Engines, &c., of which the following is a specification, reference being had to the accompanying drawings.

10 This invention relates to devices in or by means of which air as it passes on its way to the working cylinders of explosion-engines or other desired places of use is mingled with the vapor of gasoline or other hydrocarbon to form explosive or combustible mixtures.

15 The improved carbureter comprises a vaporizer by which the hydrocarbon is exposed to the incoming air in such manner as to be thoroughly vaporized and a mixer by which the air and vapor may be thoroughly mixed. The invention is particularly concerned with the construction of the vaporizer whereby the hydrocarbon shall be delivered in suitable quantities and shall be thoroughly vaporized and whereby the proper quantity of hydrocarbon may be introduced by external manipulation in starting up the engine. The invention is further concerned particularly with the mixer, which is so constructed and arranged that a uniform mixing of the air and vapor may be secured under all conditions of use.

20 The invention will be more fully described with reference to the accompanying drawings, in which its several features are represented, for purpose of illustration and explanation, as embodied in a convenient and practical construction.

25 In said drawings, Figure 1 is a view in side elevation of the improved carbureter. Fig. 2 is a view in vertical central section on the plane indicated by the line 2-2 in Fig. 1. Fig. 3 is a plan view of the hood to which the hydrocarbon is delivered for vaporization. Figs. 4 and 5 are respectively a plan view and an edge view of one form of mixer. Fig. 6 is a detail view in vertical central section, illustrating a modified form of the mixer.

The shell or body A may be of any suitable

form to support and inclose the vaporizer and mixer. As represented in the drawings, it is substantially cylindrical for the greater portion of its length, having a neck *a* for attachment to the pipe by which the mixture of air and vapor is conducted to the place of use, such neck being preferably offset or arranged laterally in order to afford a central bearing, as at *a'*, for the supporting-rod of the mixer. Secured to the lower end of the shell, preferably by being threaded therein, is a base-piece B, which is provided with a suitable number of openings *b* for the admission of atmospheric air, such openings being inclined inwardly in order to direct the air against the vaporizing-hood, hereinafter referred to. The base-piece B is further provided with an inlet *b'* for the gasoline or other hydrocarbon, a needle-valve *b²*, by which the supply of hydrocarbon can be regulated, and a duct-*b³*, through which the hydrocarbon is delivered to the vaporizing-hood, such duct terminating in a vertical boss *b⁴*. The vaporizing-hood C is so formed as to spread the hydrocarbon over a surface of considerable area, upon which it is brought into contact with the incoming air. It may comprise a sleeve *c*, which fits upon and is guided in its vertical movements by the boss or stud *b⁴*, and a light framework *c'*, upon which is secured a perforated cover *c²*, preferably of fine gauze. The hood is supported by a yoke or light framework *c³*, which is secured to a valve-plug *c⁴*, which closes the upper end of the duct *b³*. When the engine is in operation, the rush of air into the carbureter through the openings *b* during the charging stroke of the engine lifts the hood C and with it the valve-plug *c⁴*, thereby admitting a new charge of hydrocarbon, which flows over the conical cap *b⁵*, through the upper end of the boss *b⁴*, and falls upon the gauze *c²*. The cap *b⁵* serves not only to distribute the hydrocarbon, but as a stop to limit the upward movement of the sleeve *c*, and consequently the opening of the valve.

For the purpose of admitting the necessary quantity of hydrocarbon to start the engine before the action of the feed has become automatic a manually-operated lifting device for

the hood is provided. As shown in the drawings, it may comprise a pin D, which is projected upward through the base-piece B against the framework of the hood C, while
 5 a thumb-lever d is also pivoted upon the base-piece, with its inner end supporting the pin D, so that the hood can be lifted by depressing the outer end of the lever. A spring d'
 10 may be interposed between the inner end of the lever and the base-piece to counterbalance the weight of the outer arm of the lever.

For the purpose of securing a thorough mixture of the air and vapor a mixing device may be provided within the shell or body A. As
 15 shown clearly in Figs. 2, 4, and 5, the mixer E may consist of a disk e of thin metal, with vanes or wings e' struck up, such disk being supported for rotation by a rod F. The rush of air through the shell or body A during the charging stroke of the engine causes
 20 the mixer E to rotate rapidly upon its bearing, and thereby to effect a thorough mixture of the air and vapor. The chamber of the shell or body A may be choked slightly, as at
 25 a^2 , by an inwardly-projecting ring or shoulder, which can be conveniently finished so as to permit the mixer to have a close working fit within it, thus preventing the passage of
 30 any drops of hydrocarbon. In order that the mixer may be adjusted to give the best results under different conditions of use, the rod F may be threaded, as at f , to engage its
 35 threaded seat a' , so that by rotation of the rod F by a suitable handle (not shown) the mixer may be raised or lowered with respect
 40 to the ring a^2 . A jam-nut f' may be applied to the rod F above the bearing a' to secure the rod F in its adjusted position.

A slightly different form of mixer is shown
 45 in Fig. 6, in which the disk e^2 is threaded or otherwise secured to the rod F and is provided with perforations e^3 , through which the vapor and air are forced, and thereby mixed thoroughly. The adjustment of this mixer
 50 may be effected in the manner described above with reference to Fig. 2.

In the operation of the carbureter the valve
 55 b' is opened to admit hydrocarbon to the seat of the valve c^4 by gravitation or under suitable pressure. By the operation of the thumb-lever d and pin D valve c^4 is then raised from
 60 its seat and the hydrocarbon flows out over the cap b^5 and upon the vaporizing-hood C, where it spreads out on the hood and is vaporized
 65 by the air which rushes in during the charging stroke of the engine through the air-inlets in the base-piece B. The vapor thus
 70 formed is carried onward through the shell or body A, is thoroughly mixed by the mixer
 75 E, and then passes onward through the neck a to the desired place of use. When the engine has been set in motion, the vaporizing-hood C and the valve c^4 are lifted automatically by the rush of air during each charging
 80 stroke of the engine, and no further attention

is required save to regulate the needle-valve b^2 and the mixer E as may be required.

I claim as my invention—

1. In a carbureter, the combination of a hydrocarbon-inlet, a valve for the inlet, a movable vaporizing-hood below and surrounding the inlet and carrying the valve, and means whereby the incoming air is directed against said hood to lift the same and the valve and permit the hydrocarbon to flow past the valve
 75 and through and upon the hood, substantially as shown and described.

2. In a carbureter, the combination of a shell or body, a base-piece secured thereto and having air-inlets and a hydrocarbon-duct
 80 therethrough, a vaporizing-hood below the terminal of said duct supported and guided by said base-piece and a valve-plug carried by said hood and controlling the flow of hydrocarbon through said duct upon said hood,
 85 substantially as shown and described.

3. In a carbureter, the combination of a shell or body, a base-piece having air-inlets and an oil-duct therethrough and having a central boss, a vaporizing-hood below the terminal of said duct having a sleeve movable
 90 upon and guided by said central boss, and a valve-plug carried by said hood to regulate the flow of hydrocarbon through said duct upon said hood, substantially as shown and
 95 described.

4. In a carbureter, the combination of a shell or body, a base-piece having air-inlets and an oil-duct therethrough and a central boss, a conical cap secured upon the upper
 100 end of said boss and from which the hydrocarbon may flow, a vaporizing-hood and a valve-plug carried by said hood to control the flow of hydrocarbon through said duct, substantially as shown and described.
 105

5. In a carbureter, the combination of a shell or body, a base-piece having air-inlets and an oil-duct therethrough, a vaporizing-hood below the terminal of said duct, a valve-plug carried by said hood to control the flow
 110 of hydrocarbon through the oil-duct upon said hood, and means manipulated externally for lifting said hood and valve-plug for starting up, substantially as shown and described.

6. In a carbureter, the combination of a
 115 shell or hood, a base-piece having an oil-duct therethrough, a vaporizing-hood, a valve-plug carried by said hood to control the flow of hydrocarbon through said duct, a pin projected upward through said base-piece against
 120 said hood, and a lever pivoted externally to said shell or body to cooperate with said pin for the purpose of lifting said hood, substantially as shown and described.

This specification signed and witnessed this
 125 15th day of July, A. D. 1901.

NELSON G. HARRIS.

In presence of—

W. H. MULLEN,
 C. T. BENTZ.