

913,169.

W. H. SANDERS.
DISTRIBUTER.
APPLICATION FILED JUNE 11, 1907.

Patented Feb. 23, 1909.

Fig. 1.

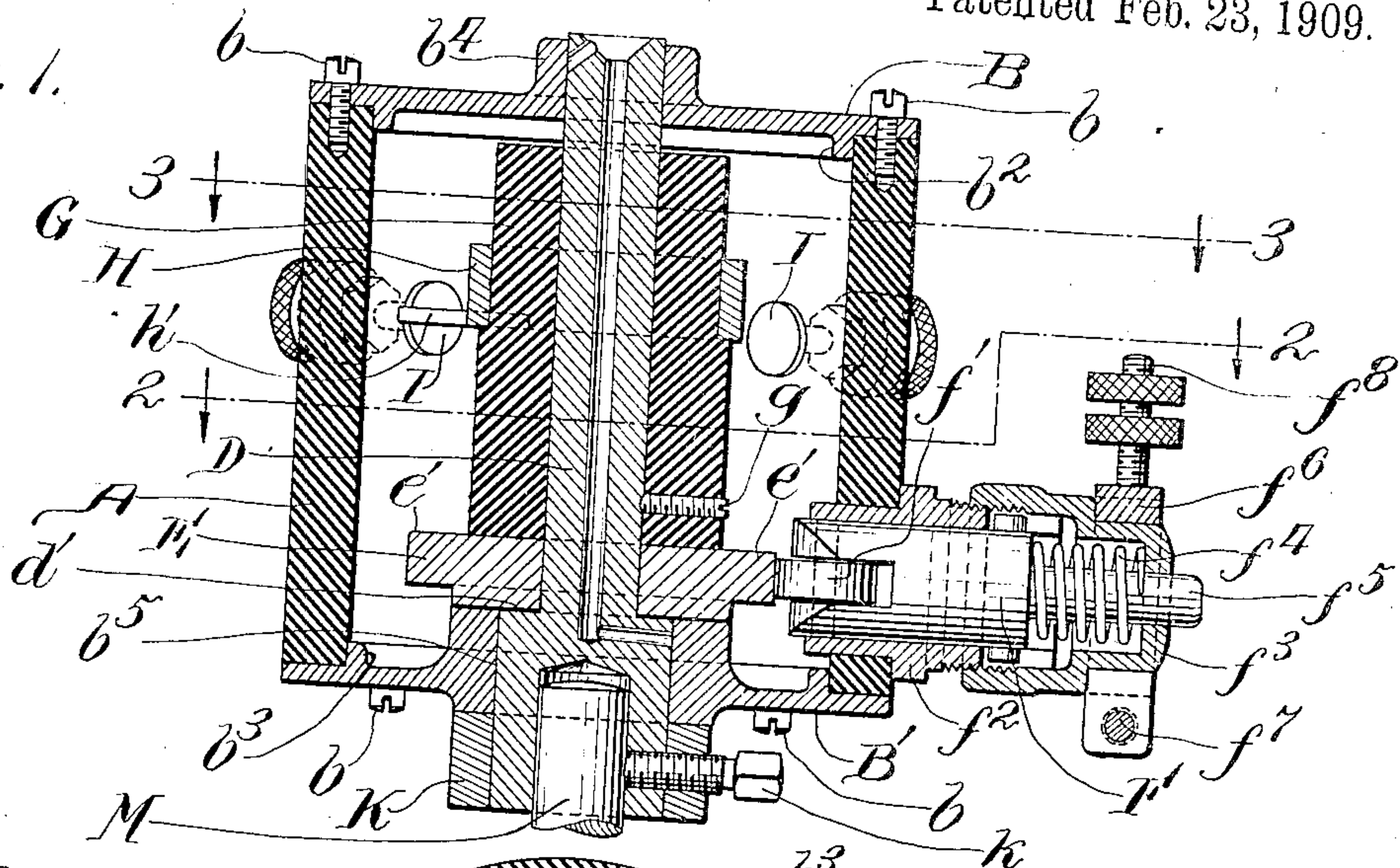


Fig. 2.

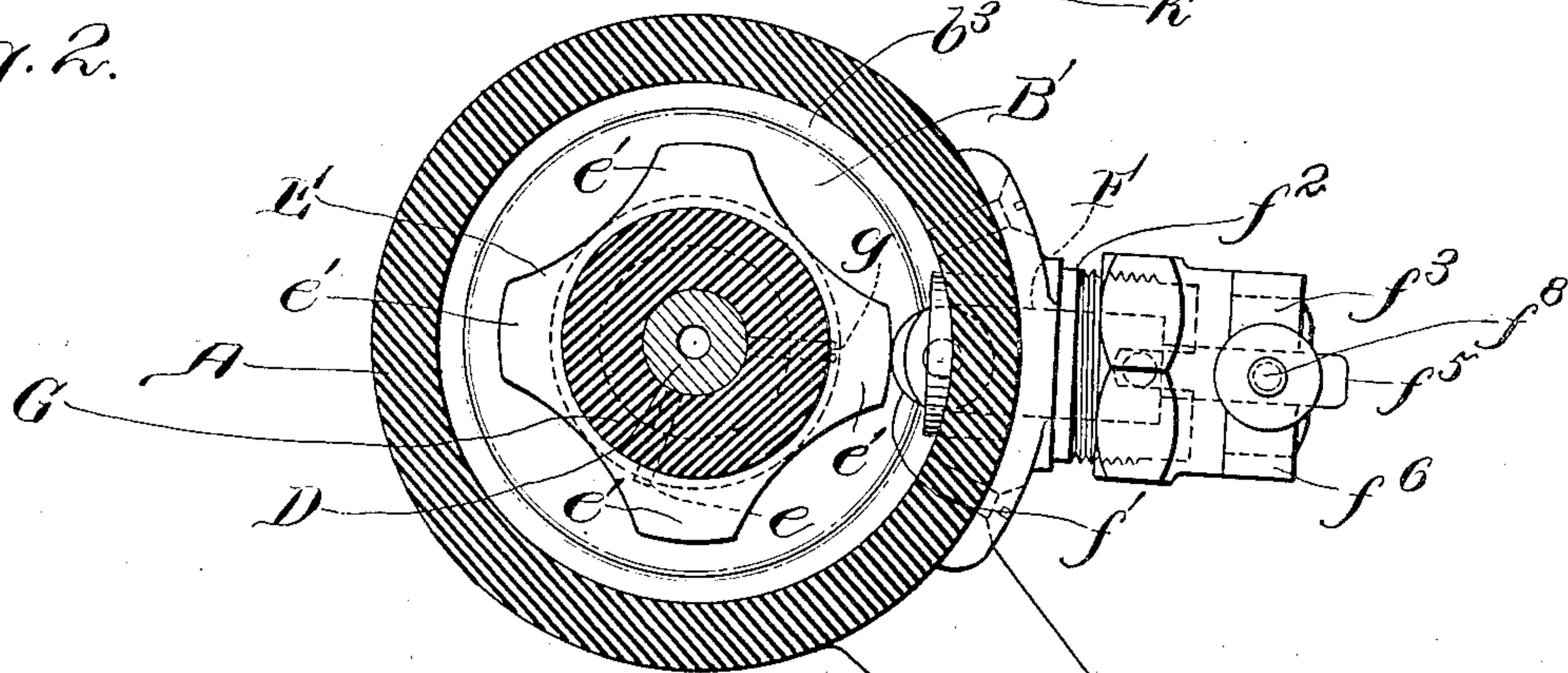
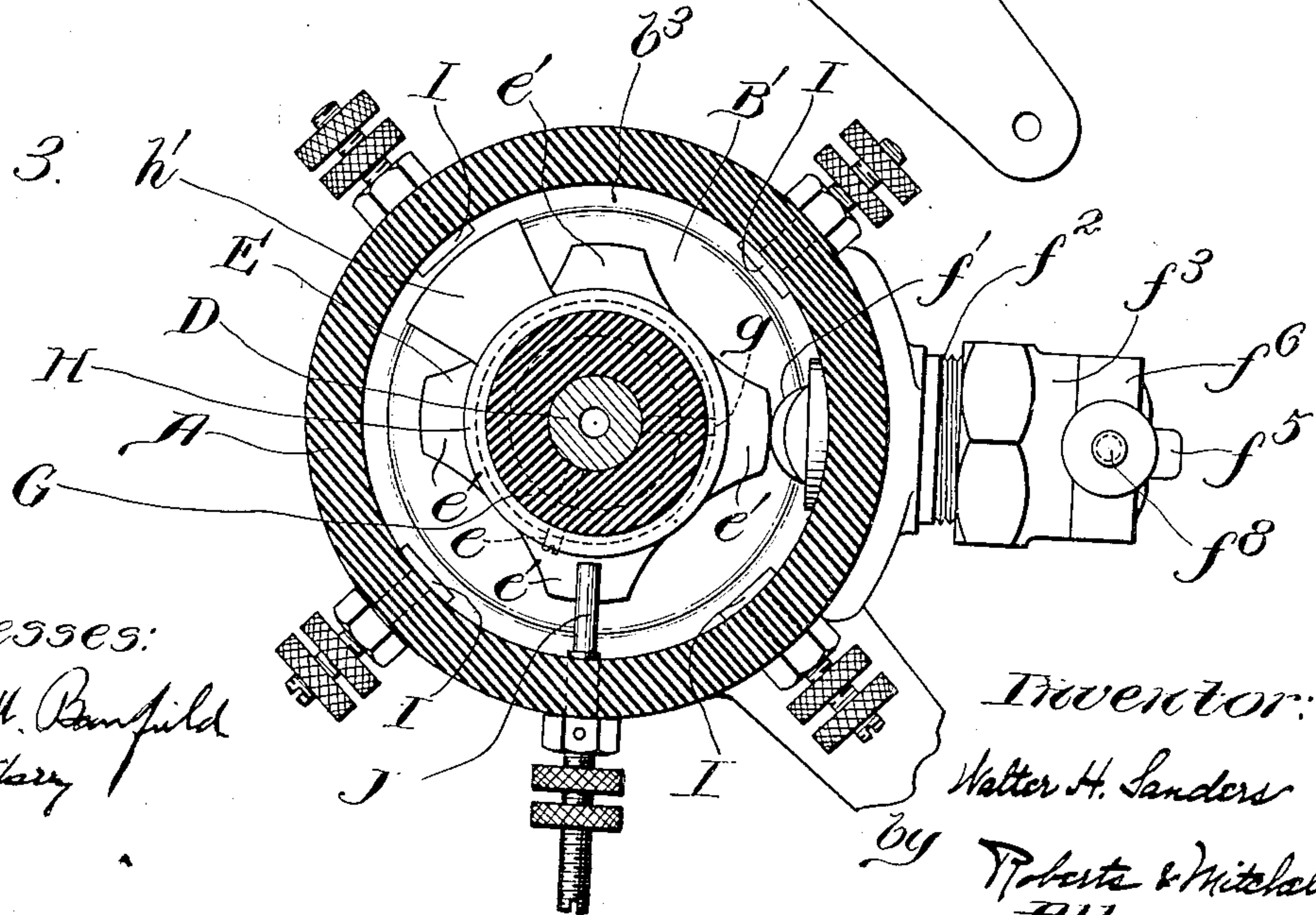


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

WALTER H. SANDERS, OF ORANGE, MASSACHUSETTS.

DISTRIBUTER.

No. 913,169.

Specification of Letters Patent.

Patented Feb. 23, 1909.

Application filed June 11, 1907. Serial No. 378,354.

To all whom it may concern:

Be it known that I, WALTER H. SANDERS, a citizen of the United States, and resident of Orange, in the county of Franklin and State of Massachusetts, have invented new and useful Improvements in Distributers, of which the following is a specification.

My invention relates to a distributor for electrical current and is adapted particularly to the distribution of such current for ignition of explosive charges in multi-cylinder internal combustion gasoline motors.

The object of my improvements herein to be described is to provide a distributor of simple and substantial construction, durable, permanently accurate in its operation and easily accessible as to all its parts, so that inspection, cleaning and adjustment may be facilitated as far as possible and the necessity for attention reduced to a minimum.

In the drawings hereto annexed which illustrate an embodiment of my invention,—Figure 1 is a vertical section of the distributor; Fig. 2 a cross section taken on the line 2—2 of Fig. 1 looking in the direction of the arrow; and Fig. 3 is a cross section on line 3—3 of Fig. 1 looking in the direction of the arrow.

The main part of the fixed portion of my improved distributor consists of a shell A of insulating material, preferably hard rubber or vulcanite, the said shell being of circular cross section throughout. Preferably the insulating shell A is made cylindrical as this form is, by reason of its symmetry, less liable to warp or become distorted than more complicated or asymmetrical forms. At the two ends of the insulating shell A I provide the head and foot plates B, B'. Each of these plates is formed with a flange as b^2 , b^3 , these flanges being circular and so proportioned that they fit internally into the insulating shell A at the two ends. Screws b passing through the head and foot plates into the insulating shell secure the plates to the end of the shell. The function of the flanges b^2 , b^3 is important. A circle being the most capacious figure, it follows that distortion would tend to diminish the area inclosed by the circular walls of the shell, and as this area is fixed, at its largest, by the circular flange, the flange meets and resists any attempted change of shape of the shell. By this means the two head plates effectively retain the shell in its true geometrical form, so that the contact making leads

which are secured to the shell will at all times maintain their proper adjustment.

In the head plate B there is formed the top bearing b^4 and in the foot plate B' the bottom bearing b^5 , which bearings are axially concentric with the shell A and serve as bearings for the rotating shaft D. This shaft is formed with a shoulder d' at or near the bearing b^5 and projects from the foot plate B' so that it may be attached as by a set screw k passing through the guard ring K to a shaft M which derives its rotation from some convenient portion of the motor mechanism. The upper end of the shaft D finds its bearing at b^4 .

Just above the shoulder d' the primary circuit closer E is secured to and in electrical contact with the shaft D. This circuit closer for the primary circuit consists of a plate provided with projecting wipers e' which are preferably integral with the plate itself, these corresponding in number to the number of spark excitations to be made in a rotation of the distributor shaft D. The primary circuit closer E is secured to the shaft D by a screw e .

The contact maker for the primary circuit which coöperates with the circuit closer E, consists of the plunger F which projects through a hole in the insulating shell A and is provided at its inner end with a roller f' which makes contact with the wiper projections e' successively as the circuit closer E is rotated. The plunger F slides in a housing f^2 which is secured to the outside of the shell A. A cap f^3 which is screwed onto the housing f^2 confines the spring f^4 which holds the plunger F yieldingy pressed toward the circuit closer E. The center pin f^5 , which is centrally secured in the outer end of the plunger F projects slightly through a central hole in the cap f^3 , and assists in guiding the plunger and serves also as a visible tell-tale whereby the correct operation of the plunger F may be ascertained without detaching any part of the instrument. A split clamp f^6 constricted by the screw f^7 is secured to the outer end of the cap f^3 and carries the binding post f^8 .

The sleeve G of hard rubber or other insulating material surrounds the shaft D and is secured thereto as by a screw g . Upon the insulating sleeve G there is fixed the metallic ring H which is provided with a radially projecting segmental arm h' , this member constituting the circuit closer for the

secondary circuit. At proper intervals secondary circuit leads I are inserted in the insulating shell A and project inwardly therefrom to within spark jumping distance 5 of the circular path of the outer edge of the segmental arm h' . Also at some convenient intermediate point the secondary circuit coil lead J is placed, this lead projecting inwardly to spark jumping distance of the ring G. The leads I are spaced to correspond with the angular spacing of the wipers e' on the primary circuit closer E and are so arranged that the primary circuit is closed through the closer E and the plunger contact f' synchronously with the opposition of 15 the segmental arm h' with the leads I. The closure of the primary circuit is made through the contact of the wiper projections e' and the roller f' while the closure of the secondary circuit is made by the sparks jumping from the leads I to the segment arm h' in succession, the lead J being also within spark-connecting distance of the ring H. The above described parts are also so 25 portioned and arranged that the primary contact at f' is made just as the segment arm h' comes within sparking distance of the secondary lead I and break contact just as the segment arm is passing out of spark jumping distance from the lead I. Consequently, by 30 the operation of the distributor itself the secondary circuit is excited first by the make in the primary and then by the break so that a double sparking is made certain and its effect felt at the spark plug of the engine 35 cylinder.

By virtue of the construction above described when the adjustment of the secondary leads I and J is once made with reference to the circuit closer h' , no adjustment 40 will be necessary because warping and distortion of the shell A is effectually prevented by the flanged head and foot plates B and B', and as the shaft D is provided with metal bearings in both the head and foot 45 plates and the said bearings are concentric with the shell A, no disturbance of the proper adjustment is possible under normal conditions.

50 The above described spark distributor is

very easy to take apart or to assemble. By removing the screw k after disconnecting the lead wire, the entire distributor can be taken from the driving shaft M and the holding ring K removed. Then, by removing 55 the head plate B and foot plate B' the shaft D, carrying the circuit closer E and insulating sleeve G can be removed and likewise the primary circuit closer can be removed by loosening the screws e and g . 60 Also if it be desired to examine the contact plunger F, the cap f^3 is easily unscrewed from the housing f^2 and the plunger with its spring may then be withdrawn. By merely taking off the head plate B the entire interior of the apparatus is disclosed to view 65 and it is then easy to make accurate adjustment of the leads I and J.

I claim:

The above described distributor comprising 70 a shell A of insulating material; a metal head plate B fixed to one end of shell A and made with shell supporting flange b^2 ; a metal foot plate B' fixed to the other end of shell A made with shell supporting flange 75 b^3 ; a shaft D journaled in plates B and B', and provided at one end with a coupling member; a wheel E fixed to shaft D and made with radial arms e' ; a roll f' cooperating with the arms e' of wheel E; a 80 plunger F carrying roll f ; a spring f^4 acting on plunger F; a bearing f^2 extending through shell A; means to hold plunger F against rotation in bearing f^2 with provision for limited endwise movement of the 85 plunger so that only arms e' engage roll f' ; a cap f^3 ; a sleeve G of insulating material fixed to shaft D; a ring H made with an arm h' ; the circular series of leads I extending radially through shell A and cooperating 90 with arm h' ; and a lead J extending radially through shell A and cooperating with ring H.

Signed by me at Orange, Massachusetts this seventh day of June 1907.

WALTER H. SANDERS.

Witnesses:

CHAS. B. GRANT,
CHAS. H. EGER.