H. M. REICHENBACH.
CARBURETER.
APPLICATION FILED JAN. 27, 1915.

1,167,217.

Patented Jan. 4, 1916.
3 SHEETS—SHEET 1.

Fig. 1.

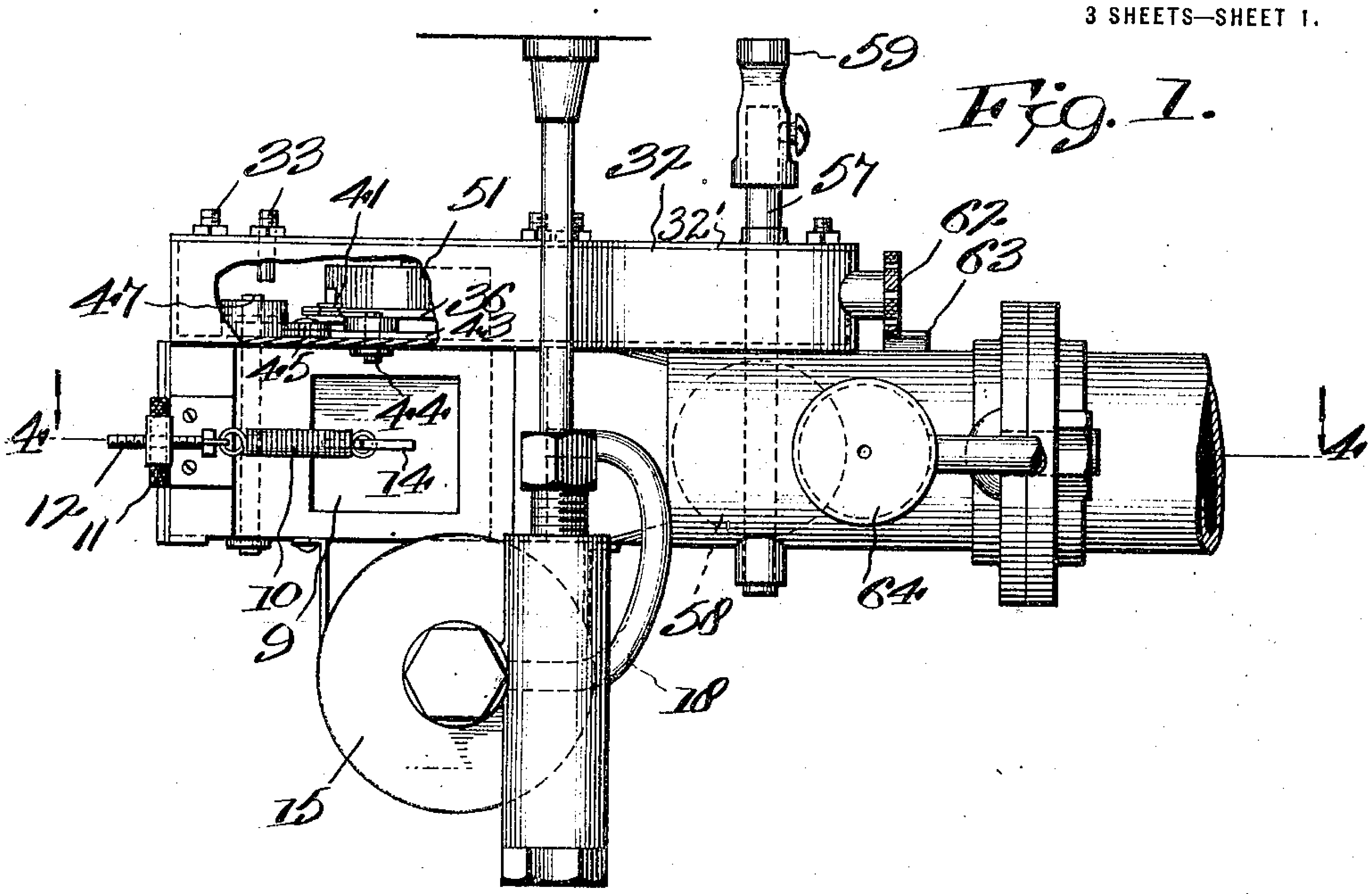
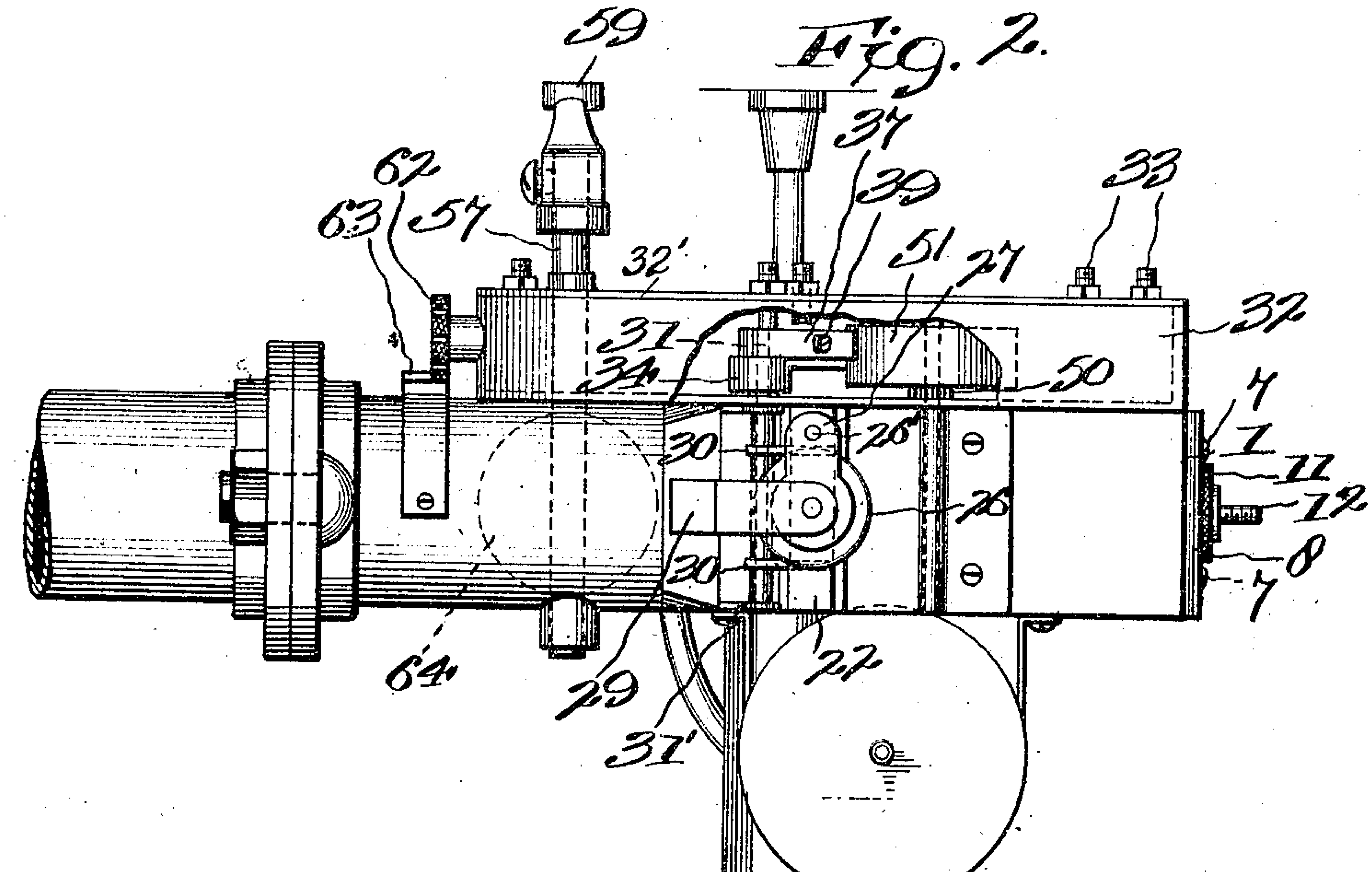


Fig. 2.



Witnesses
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3 SHEETS—SHEET 2.

Fig. 3.

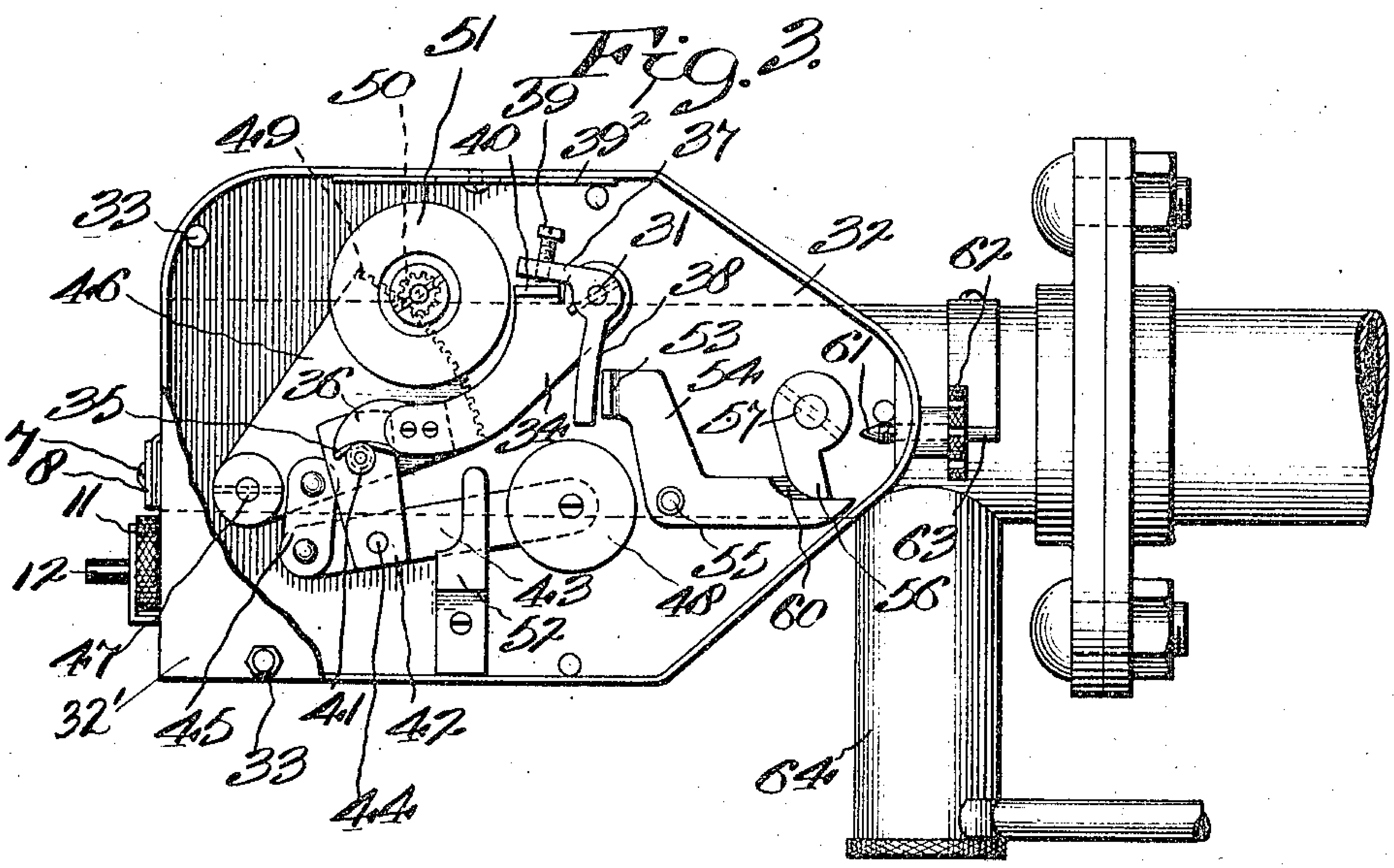
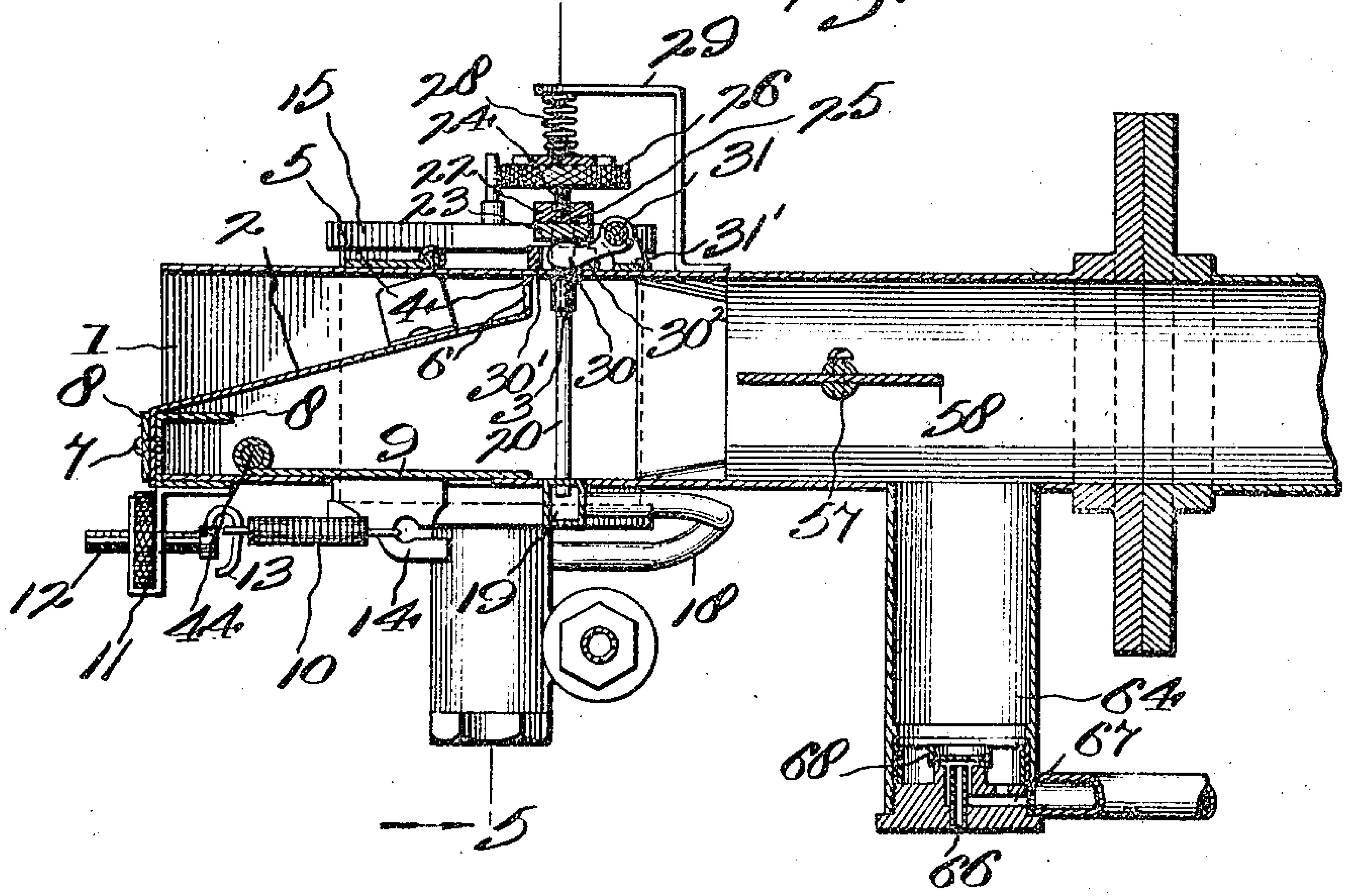


Fig. 4.



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3 SHEETS—SHEET 3.

Fig. 5.

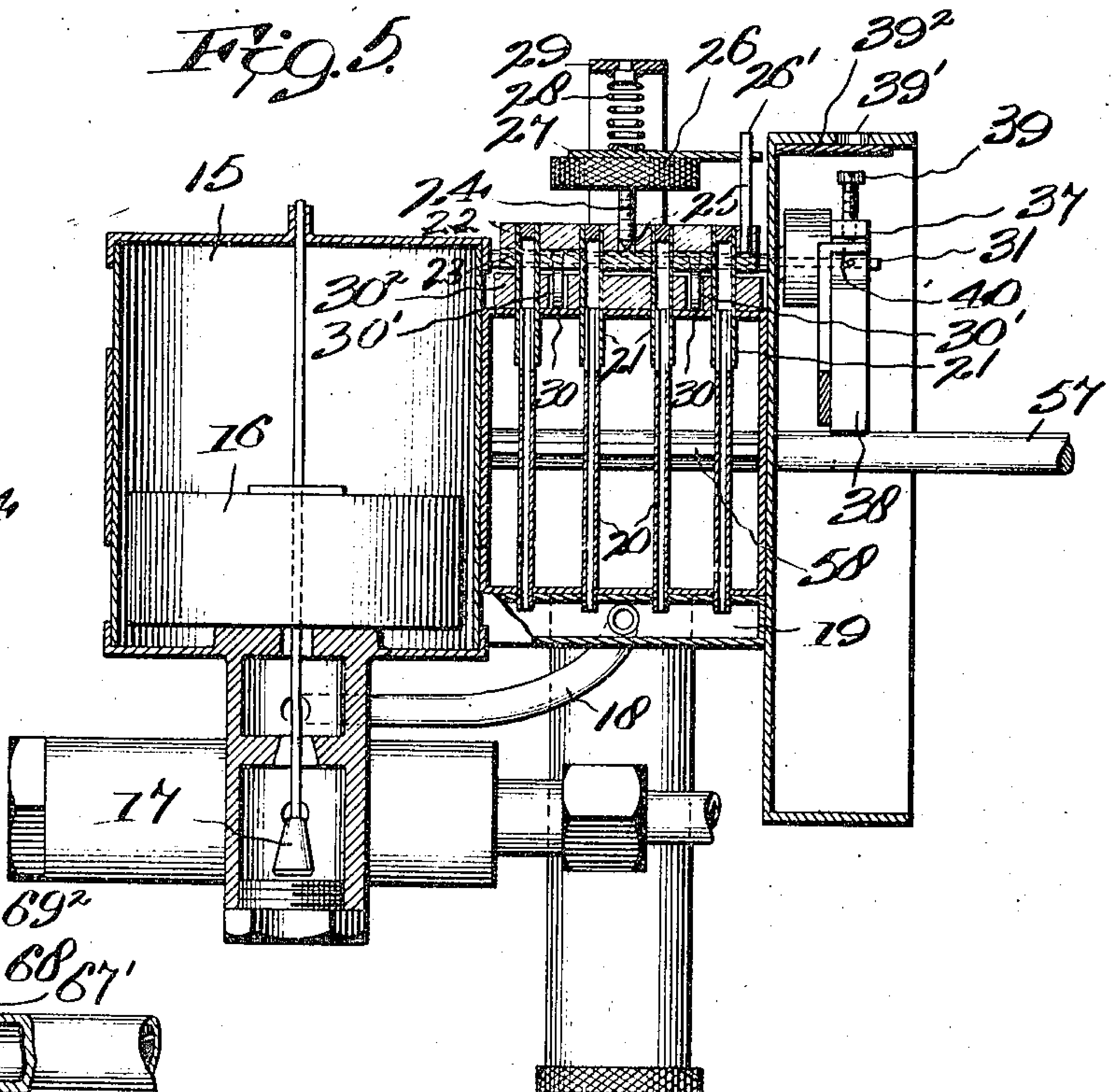
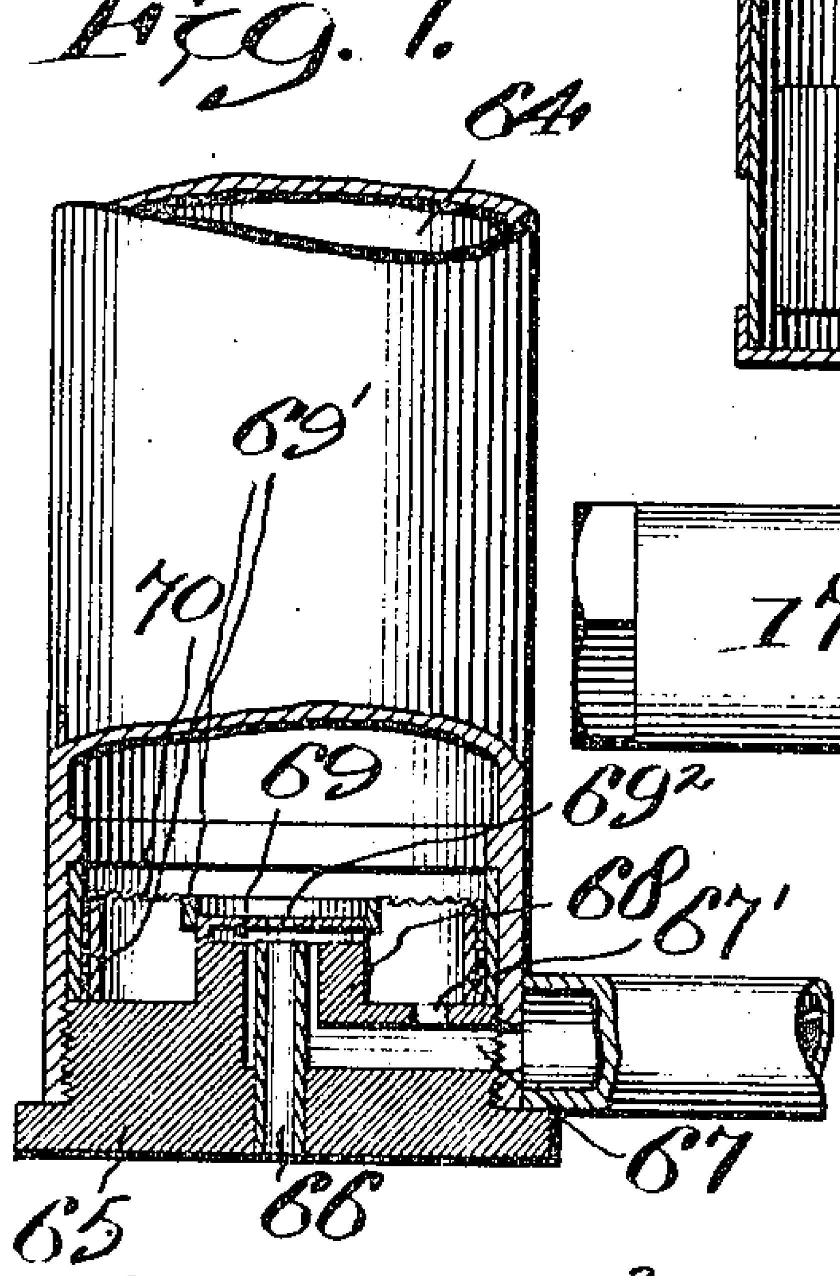


Fig. 7.



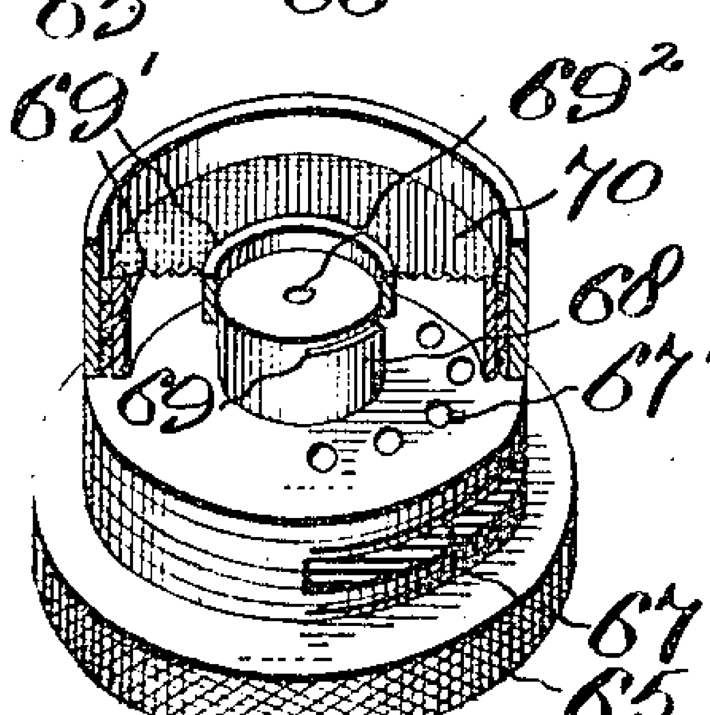
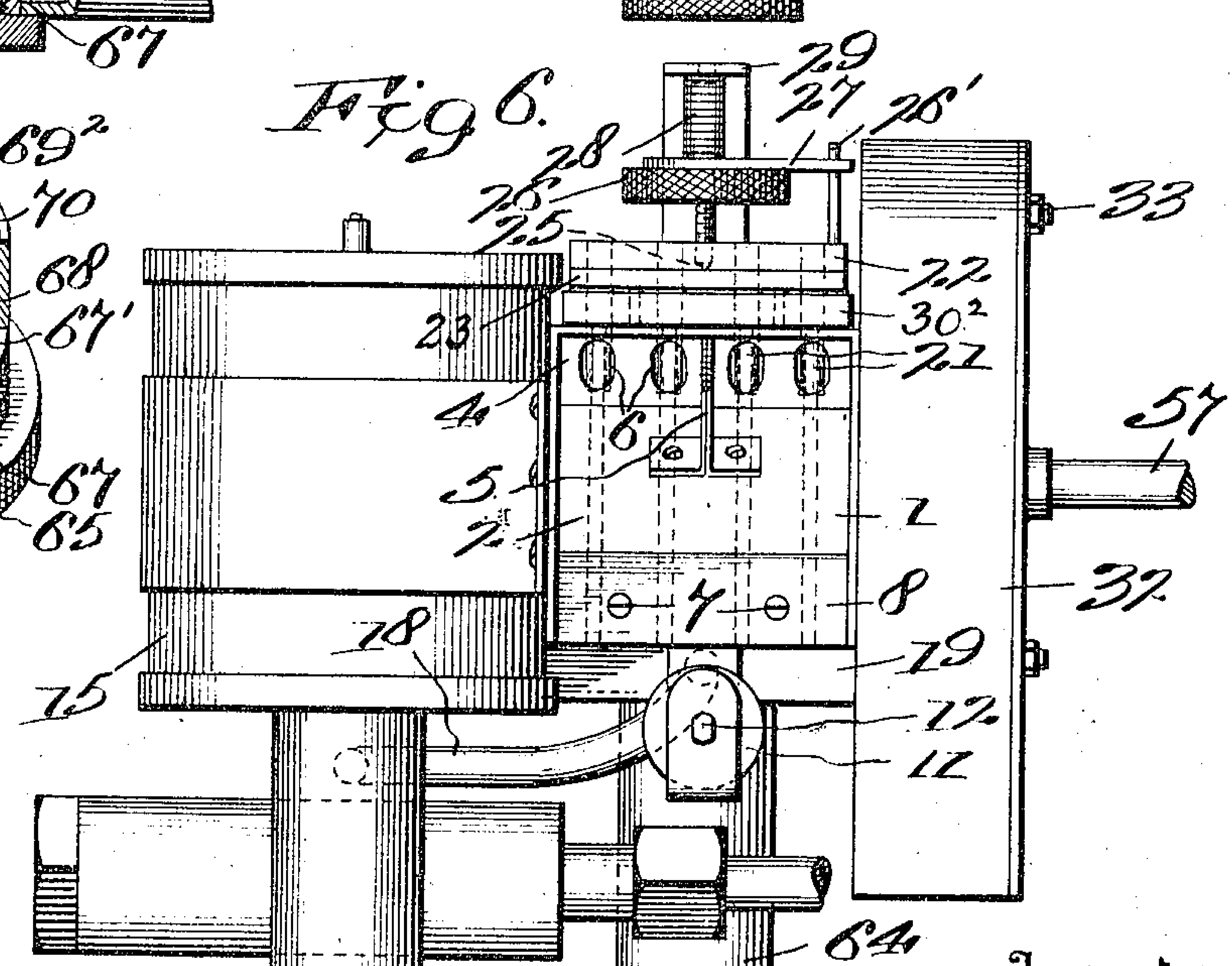


Fig. 8.

Fig. 6.



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UNITED STATES PATENT OFFICE.

HENRY M. REICHENBACH, OF ROCHESTER, NEW YORK.

CARBURETER.

1,167,217. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed January 27, 1915. Serial No. 4,721.

To all whom it may concern:

Be it known that I, HENRY M. REICHENBACH, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Carbureters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in carbureters or fuel feeding devices for internal combustion motors, providing efficient means for the utilization in such devices, of fuels containing constituents of widely varied boiling points, inasmuch as my device is very effective in atomizing or nebulizing those constituents which are not easily volatile.

It produces an extremely minutely subdivided condition of these fuels, so that they are readily carried through the engine intake and burnt in the motor.

It also provides for extracting coarser particles of fuel or the spray which may be accumulated on the throttle in partially closed positions of the latter, or on the conduit walls, by providing a well into which such particles may be collected and instantly subjected to re-atomization.

It also provides means for differentially and automatically proportioning the air and fuel, at the same time permitting of an increased or diminished volume of fuel in proportion to the air throughout the differential range.

It also provides means for obviating need for nice adjustment as to level.

It also provides for means for varying resistance upon the air currents to vary the engine vacuum.

It also provides for means for maintaining the differential element secure from molestation while providing adjustments which the user may make, and which are not such as will enable him to change the device to a degree detrimental to the motor operation.

The casing inclosing the working parts may be sealed, so that any tampering with the mechanism can be readily detected. This is a valuable feature to the maker of engines. The inclosure also serves to protect the moving parts from dust and dirt, and therefore protects them from undue wear.

Means are also provided for enriching the charge in starting the motor by increasing temporarily the size of the fuel-emitting orifices, permitting a very large quantity of fuel being carried into the motor in proportion to air fed in. This is in contradistinction to those devices in which in priming or starting a motor, air is kept out of the intake, thus throwing the entire cylinder suction during cranking, upon the fuel jets. Inasmuch as the nebulized fuel is carried into the motor in the air current, it is evident that any such shutting off the air current removes the means for fuel transportation and therefore shuts off the fuel supply.

At the same time that means are provided for increasing the amount of fuel during motor starting, means are provided for preventing the device from remaining in the priming adjustment, as this would deliver too large a volume of fuel for motor operation.

Means are provided, attached to the throttle shaft, whereby opening of the throttle throws out of action the priming connections.

Means are also provided whereby the differential feed of fuel may be thrown into or out of engagement. Also means are provided for counterbalancing the weight of the auxiliary air intake valve, as well as means for preventing the valve from flapping. These means also serve to retard momentarily, the passage of air through the valve upon sudden increased demand of the motor, due to throttle opening. The effect of this is to improve motor acceleration or speeding up, as without some retarding device, owing to the difference in elasticity and inertia of the air entering and those of the fuel, the mixture is diluted too largely on account of the sudden change of relative adjustments of air and fuel.

By means of my present device the inertia of the air in comparison to that of the fuel is transferred to the inertia of a metallic mass represented by a fly-wheel.

I have illustrated one form of my invention in the accompanying drawing, in which:

Figure 1 is a bottom view. Fig. 2 is a plan view, the device being reversed in direction. Fig. 3 is a side elevation with the covering plate removed. Fig. 4 is a central sectional view on the line 4—4 through Fig. 1. Fig. 5 is a cross section on a larger scale, on line

5—5 of Fig. 4, showing the jets. Fig. 6 is an end view on the same scale as Fig. 5. Fig. 7 is an enlarged view of the atomizing device at the bottom of the well. Fig. 8 is an enlarged detail of my atomizer.

In the accompanying drawings, the sign 1 represents the intake conduit of my device, said conduit being in the present embodiment, rectangular in cross section at the entrance end, and circular in cross section at the engine end. The sign 2 represents an air deflecting plate or tongue, fixed in position and arranged to deflect the entering air past certain fuel discharge openings 3. This deflecting plate extends from the bottom of the intake conduit obliquely forward to the immediate vicinity of the fuel discharge openings and ends in an upright portion 4 secured to the plate 2, and adapted to be held against the top of the conduit by the elasticity of the plate, said plate being provided with the brace 5 to prevent buckling in case of heavy back fire in the conduit. The upper perpendicular end is pierced or perforated, as at 6, to permit the passage of air and to localize the air with respect to the fuel openings 3. At its outer or lower end the said plate is bent downward and fastened by screws 7 to a bench or support 8 extending across the bottom of the intake conduit.

An auxiliary air intake valve 9, through which passes the main quantity of air, is provided at some suitable place, preferably in the bottom wall of the conduit end below the deflecting plate. This valve is held in closed position by a spring 10, the tension of which may be adjusted by milled nut 11 and screw 12, the spring extending between the hook 13 on the screw and hook 14 on the valve, as here shown. This valve may be adjusted by means of the screw, to open at any desired pressure and admit additional air to mix with the fuel.

The sign 15 represents a constant level fuel tank provided with a float 16 for controlling at valve 17 the admission of fuel to the fuel tank. From said tank the fuel flows by means of pipe 18 to the header 19, whence it rises through the pipe 20 to the fuel discharge openings 3. These openings are arranged vertically crosswise of the channel, and their mouths or edges are perpendicular to the direction of the air, so that the entering air has a truly atomizing effect in that it planes off or shears off the rising liquid fuel in the form of a nebula or mist. The pipes 20 are of comparatively small diameter, so that they behave like capillary tubes, thus carrying up or lifting the fuel and obviating to some extent the necessity of extremely nice adjustment of fluid level. The discharge level is adjusted as a result both of flow or hydrostatic pressure and capillary attraction, and the level in the tank may be below that of the fuel openings even to the extent of one-fourth inch, without affecting the efficiency of my carbureter.

Great trouble is experienced ~~in~~ the average carbureter by flooding, due to the necessity of having the level of the fuel in the float chamber about the height of the opening in the jet. By using capillary tubes a level lower than the discharge level may be maintained in the float chamber, and yet the fuel level will be in proper relation to the openings. It will be seen that while, by hydrostatic pressure, a constant level is maintained, capillary action carries the fuel level above the point to which hydrostatic pressure alone would raise the fuel, and yet the capillary lift may never be above the discharge openings, and flooding is not so liable to occur as when hydrostatic pressure alone controls the level.

Each of the tubes is provided with a sleeve 21, which rides up and down over the discharge openings and opens or closes them to a greater or less extent. These sleeves are here shown as all of the same length, and the slots and tubes all of the same size and height, though it is manifest that variations among these different elements in the same device may sometimes be permissible and even desirable. The sleeves referred to, move up and down through the top of the intake conduit, and are all, as here shown, secured to the upper part of a head or cap. This head consists of an upper part 22, to which sleeves are secured by means of plugs, and a lower part 23, with respect to which said sleeves may be adjusted. The two parts of this head are movable toward and from each other, the distance between them being controlled by a ~~screw 24 threaded~~ into the upper part 22 and bearing upon the lower part 23 at 25. By turning the milled head 26 the two may be separated. The lower part 23 always comes to rest in a fixed position. The upper part comes to rest in a position more or less above this.

Secured to the lower part 23 of the head, and at one side thereof, is a rod 26′, passing upwardly through a suitable opening in the upper part 22. To the upper end of this rod is secured a plate 27 extending toward the center of the head and resting upon the milled head 26. Above this plate and pressing against said plate is a spring 28, the upper end of which presses against a bridge or bracket 29 secured to the top of the conduit. The spring is thus compressed between the bracket or bridge 29 and the plate 27, and has, therefore, a tendency to press down on the plate and the milled screw head, to shove down the head and the sleeves carried thereby and to cover up the fuel discharge openings accordingly; the degree to which this "covering up" is carried being determined by the degree of separation between the two parts of the head, determined by the screw 24. This in turn, determines the relation of the cap or head to the fuel openings, and the extent to which they may be uncovered or covered, as is obvious. By proper adjustment of this screw 24, the supply of fuel may be cut off entirely or a constant small supply provided. The head is made to rise and to carry with it the sleeves, thereby uncovering the fuel openings, by means of a lifting lever, or levers 30, mounted on a shaft 31 mounted in brackets 31′, and extending across the top of the conduit and prolonged to extend into a casing or chamber 32 having a cover 32′, bolted together at 33 and secured to the side of the carbureter. The levers 30 play in slots 30′ in a block or filling piece 30^2.

In Fig. 3, I show this casing with the outside or covering part removed, and I also show by dotted lines, the contour or outline of the intake conduit. On the shaft 31, I mount loosely, a cam arm 34. Said cam arm has a working cam face 35, the contour or curve of which is determined for an engine of any particular type in accordance with the engine's differentially calculated curve of greatest efficiency. The working cam face may be mounted on a detachable part of this cam arm, as at 36, and to adapt my carbureter for engines of any particular type, it is necessary to attach a part 36, the cam surface or working face of which has been previously differentially determined. Once determined for any typical engine, it remains constant for all engines of that type. On the same shaft 31 I fix a crank having two arms 37, 38, close against the loose cam or cam bearing arm 34.

The arms 37, 38 of the crank are, as shown, arranged approximately at right-angles to each other. In the end of one of them, *i. e.* the upper or horizontal one, 37, I mount a screw 39, the end of which meets or bears upon a bracket 40 on the cam arm 34. The screw 39 may be set by passing a tool through an opening 39′ in the wall of the casing covered by the plate 39^2, not removable when the casing is closed. The contoured or shaped end of this arm rests upon a pin 41, on which may be a roller. The cam arm 34 may have free movement over a small arc, *i. e.* from its position shown in Fig. 3, with its end resting on pin 41 till the bracket 40 strikes against the end of the screw, so that there may be a little play of the cam bearing arm before it engages the fixed two-armed crank, as shown in Fig. 3. This play gives opportunity for slight movement of valve 9 before the fuel supply is affected. The pin roller 41 is mounted upon an arm 42, fixed on lever 43 mounted on pin 44 secured to the casing. One end of lever 43 is secured by link 45 to a sector 46 fixed to the shaft 47, on which is fixed the valve 9 inside the conduit. When the valve 9 opens, because of the pull of the engine, the shaft 47 turns, moves the sector 46 and thereby the pin 41. The latter, moving over the differentially proportioned cam 35, raises it, and the cam arm, the bracket on which latter in engaging the end of screw 39, moves the arm 37 and thereby turns the shaft 31. The latter in turning, carries with it the levers 30, which lift the heads 22, 23, lift the sleeves 21, and thus uncover more or less of the area of the discharge openings 3.

It is thus apparent that the openings 3 are controlled by the auxiliary valve 9, and, because of the cam proportioned differentially with respect to fuel and air, this control is a differential one. That is, the openings in the deflecting plate being fixed in position and size, there is provided thus, a means of air supply directly proportional to suction, and one to which the supply of fuel may be adjusted also in fixed relation by means of screw 24 and connected parts. There is also provided air supply means variant to engine demand, and, in the presence of the constant factors established by the deflecting plate and the fixed area, if any, of the fuel discharge openings, fuel supply means differentially variant with the auxiliary air supply means in relation to engine suction, viz. valve 9.

On the outer or other end of lever 43, I provide a counterweight 48, designed to counterbalance the downward push or weight of sector 46. On the outer edge of the sector I provide a rack 49 engaging pinion 50, mounted on the shaft of a fly-wheel 51. This construction retards the motion of valve 9, and serves to prevent it from fluttering, since the inertia of the fly-wheel must be overcome before the valve can move. 52 is a keeper for the longer arm of lever 43, to keep said lever from wabbling.

The downwardly depending arm 38 of the two-armed crank mounted on shaft 31 is arranged to engage a projection 53, being part of a latch 54, the latter being secured to turn with the shaft 55. The shaft 55 extends through the casing and is mounted to turn friction tight. It may be adjusted in any desired position by a knob or equivalent means extending outside the casing, not shown. As intimated above, when the latch 54 is adjusted in certain positions, the projection 53 may contact with the depending arm 38. The angular position of the projection 53 therefore determines the permissible movement of the depending arm 38, and in consequence the opening or closing of the fuel slots. I connect the said latch 54 with the throttle valve in such a manner that the open or closed position of the throttle valve may control the position of the latch, and consequently the movement of the arm 38. This is effected by extending the latch 54 to the right, in Fig. 3, and providing it with a seat or wearing plate 60, which may be changed to meet the requirements of various engines. Contacting with this wearing plate I provide the arm 56 on the throttle shaft. When the throttle shaft is in the position shown in Fig. 3, *i. e.*, when the throttle is open, the arm 56 contacts with the seat 60. The throttle at no time controls the mixture, it can shut off the primer. The part 34 is what might be called the starting mechanism, or that permitting the increase temporarily of the fuel supply, necessary in starting a cold motor; its movement is independent of the normal running supply control means. It is operated by the shaft and acts on arm 38, temporarily opening the fuel slots wider or longer rather, than the actual operating openings. Now, in case this mechanism should be left in engagement with arm 38, the screw 39 would be out of contact and far above the bracket 40 on the cam lever, and the motor cease to be supplied in proportion to engine suction. To prevent this, means are provided on the throttle shaft to throw latch 54 out of its temporary engagement with arm 38, at the same time, this means, 56, performs other functions,—acting as an open throttle stop—in one direction, that shown, and in the other conjunction, with the screw, forming a low throttle stop. The throttle in an auto is never really closed; opening is always sufficient to keep the motor running light, so that it will not stop.

The latch 54 is used for priming or starting purposes. It is not normally in contact with the arm 38. It is used as follows:—The throttle valve may be assumed to be in a nearly closed position, being held from complete closure by the stop 61. The latch 54 is now turned to raise the cap by contact of the projection 53 with the arm 38. The motor is turned over, and starts with a rich or priming mixture. The throttle is then opened, and in opening the throttle the lock or cam 56 throws the latch 54 out of operative position, and when it is out of this position, the engine running on the priming position of the caps or sleeves is not possible.

I provide a stop 61 for the cam 56 on shaft 57 to abut against to determine the extent to which the valve may close and this stop is adjustable in the manner shown by means of a screw. This screw may be turned by means of a milled head 62, provided, it may be, with notches, in which engages a holding latch or pawl 63. This stop enables me to adjust the position of the throttle valve so that the motor may be kept running idle at low speed.

Engineward of the throttle valve in the bottom of the intake conduit, which at the throttle valve has been changed from rectangular to circular contour, I place a well. In this well any spray condensed on the throttle and trickling down, or any condensed on the walls of the conduit, collects. This drip is composed mainly, of the heavier and more difficultly volatilizable hydrocarbons. The bottom of the well is closed by a plug 65, provided with openings 66, 67, and with an atomizing device 68. As the drip runs down the sides of the well, it, as well as condensed fuel collected from the conduit walls and returning at 67, is met by outside air, coming in through opening 66, which, discharging through atomizer 68 nebulize or volatilize the collected drip and carry it again into the intake conduit.

This atomizer 68 consists of a flat plate, as shown, beneath which is a narrow slot, shown at 69, through an opening in which the air and some nebulized fuel passes in a spreading blast. A tool may be introduced when needed, to clean out any deposit of carbon or other material beneath the plate 68. Perforation 69^2 serves to admit condensed fuel. An annular strainer 70 may be provided, maintained in position by supports 69′.

In the operation of my device it will be observed that during starting (and starting cannot occur when the throttle is opened) a charge rich in fuel passes into the engine, before valve 9 can overcome its own inertia and that of the fly-wheel 51; by the selection of proper cam surface 35, the fuel and air are at all times in proper proportion to each other in accordance with the requirements of the engine; that the loose connection between the differential cam and the cap-lifting mechanism permitting some play, together with the steadying or retarding effect of the fly-wheel slow down all sudden and jarring movements of the parts of the device; and that all fuel precipitated upon the throttle valve, or upon the conduit walls before or after the throttle is reached, is again nebulized and returned to the conduit.

Moreover, while I may seal certain parts of my device against tampering by mischievous or unqualified persons, I provide means, in the milled nuts 11, 26 and 62 for all adjustment for wear, climate, fuel, and so forth, that may be necessary, after the device has once been secured in place on a particular engine. Other adjustments, such as replacing or changing the differential cam, setting of screw 39, or replacing wear block 60, can only be effected at the factory.

I claim:

1. In a fuel feeding device for internal combustion engines, in combination, an intake conduit for said engine, a deflecting plate fixed in said conduit, fuel discharge means in said conduit, said plate inclined toward said fuel discharge means, and provided with openings in proper relation thereto, and an auxiliary air valve opening

into said conduit, said auxiliary valve being arranged to respond to engine suction, a control for fuel supply, and a differential control means arranged between said valve and said fuel supply control.

2. In a fuel feeding device for an internal combustion engine, in combination, an intake conduit for said engine, a deflecting plate fixed in said conduit, fuel discharge means in said conduit, said plate inclined toward said fuel discharge means, and provided with openings in proper relation thereto, and an auxiliary air valve opening into said conduit, said auxiliary valve being arranged to respond to engine suction, a control for fuel supply, a two-part head, means for adjusting one part of said head with reference to the other, means carried by said adjusted part for controlling fuel supply, and a differential control means arranged between said valve and said head.

3. In a fuel feeding device for an internal combustion engine, in combination, an intake conduit for said engine, a deflecting plate fixed in said conduit, fuel discharge means in said conduit, said plate inclined toward said fuel discharge means, and provided with openings in proper relation thereto, and an auxiliary air valve opening into said conduit, said auxiliary valve being arranged to respond to engine suction, a control for fuel supply, a two-part head, means for adjusting one part of said head with reference to the other, means carried by said adjusted part for controlling fuel supply, a spring for maintaining said head depressed, and a differential control means between said valve and said head, for varying the position of said head with reference to the fuel supply means, in opposition to said spring in differential response to engine suction.

4. In a fuel feeding device for an internal combustion engine, in combination, an intake conduit for said engine, a deflecting plate fixed in said conduit, fuel discharge means in said conduit, said plate inclined toward said fuel discharge means, and provided with openings in proper relation thereto, and an auxiliary air valve opening into said conduit, said auxiliary valve being arranged to respond to engine suction, a control for fuel supply, a two-part head, means for adjusting one part of said head with reference to the other, means carried by said adjusted part for controlling fuel supply, a spring for maintaining said head depressed, a shaft, levers on said shaft adapted when the shaft is turned to raise said head in opposition to the pressure of the spring, and a differential control means between said valve and said shaft for causing said shaft to turn in differential response to engine suction.

5. In a fuel feeding device for internal combustion engines, in combination, an intake conduit, a fixed deflector plate in said conduit, a spring-controlled valve below said plate, fuel supplying means arranged in atomizing relation to said deflector plate and said valve, and means for varying the supply of fuel, said means arranged in differentially-controlled relation to said spring valve.

6. In a fuel supplying device for internal combustion engine, a fuel supply device consisting of tubes provided with sharp-edged discharging slots, sleeves adapted to slide over said slots and to control the extent of exposure of the slots, a head carrying said sleeves, said head made in two parts, and means for adjusting said two parts toward the adjustable part carrying said sleeves and away from each other whereby the distance to which said sleeves may move in covering said slots may be adjusted.

7. In a fuel feeding device for an internal combustion engine, in combination, an intake conduit for said engine, a deflecting plate fixed in said conduit, fuel discharge means in said conduit, said plate inclined toward said fuel discharge means, and provided with openings in proper relation thereto, and an auxiliary air valve opening into said conduit, said auxiliary valve being arranged to respond to engine suction, a control for fuel supply, and fuel control devices between said valve and said fuel supplying means, said fuel control devices including means whereby full air supply is delayed during starting when the initial charge is made rich in fuel.

8. In a fuel feeding device for an internal combustion engine, in combination, an intake conduit for said engine, a deflecting plate fixed in said conduit, fuel discharge means in said conduit, said plate inclined toward said fuel discharge means and provided with openings in proper relation thereto, and an auxiliary air valve opening into said conduit, said auxiliary valve being arranged to respond to engine suction, a control for fuel supply, fuel control devices, between said valve and said fuel supplying means, said devices including a differentially contoured cam, a shaft and levers, said cam and said shaft and levers being loosely connected so as to allow play of said cam without actuating said shaft and levers.

9. In a fuel feeding device for an internal combustion engine, in combination, an intake conduit for said engine, a deflecting plate fixed in said conduit, fuel discharge means in said conduit, said plate inclined toward said fuel discharge means, and provided with openings in proper relation thereto, and an auxiliary air valve opening into said conduit, said auxiliary valve being arranged to respond to engine suction, a control for fuel supply, fuel control devices between said valve and said fuel supplying

means, said devices, including a cam bearing arm, a cam differentially contoured for a particular engine carried by said arm, and arranged to be removed therefrom.

10. In a fuel feeding device for an internal combustion engine, in combination, an intake conduit for said engine, a deflecting plate fixed in said conduit, fuel discharge means in said conduit, said plate inclined toward said fuel discharge means, and provided with openings in proper relation thereto, and an auxiliary air valve opening into said conduit, said auxiliary valve being arranged to respond to engine suction, a control for fuel supply, fuel controlling devices between said valve and said fuel supplying means, said devices including a shaft, a cam bearing arm loose on said shaft, an arm fixed on said shaft, means on said last named arm adapted for contacting engagement with said first named arm, a shaft on which said auxiliary valve is secured, and means on said shaft for engagement with the cam on said cam-bearing arm.

11. In a fuel feeding device for an internal combustion engine, in combination, an intake conduit for said engine, a deflecting plate fixed in said conduit, fuel discharge means in said conduit, said plate inclined toward said fuel discharge means, and provided with openings in proper relation thereto, and an auxiliary air valve opening into said conduit, said auxiliary valve being arranged to respond to engine suction, a control for fuel supply, fuel controlling devices between said valve and said fuel supplying means, said devices including a shaft, a cam bearing arm loose on said shaft, an arm fixed on said shaft, means on said last named arm adapted for contacting engagement with said first named arm, a shaft on which said auxiliary valve is secured, means on said shaft for engagement with the cam on said cam-bearing arm, and retarding means in engagement with said valve-bearing shaft.

12. In a fuel feeding device for an internal combustion engine, in combination, an intake conduit for said engine, a deflecting plate fixed in said conduit, fuel discharge means in said conduit, said plate inclined toward said fuel discharge means, and provided with openings in proper relation thereto, and an auxiliary air valve opening into said conduit, said auxiliary valve being arranged to respond to engine suction, a control for fuel supply, fuel controlling devices between said valve and said fuel supplying means, said devices including a shaft, a cam bearing arm loose on said shaft, an arm fixed on said shaft, means on said last named arm adapted for contacting engagement with said first named arm, a shaft on which said auxiliary valve is secured, and a fly-wheel in geared relation to said valve shaft whereby fluttering of said valve is prevented and movement of connected parts retarded.

13. In a fuel feeding device for an internal combustion engines, in combination, an intake conduit for said engine, a deflecting plate fixed in said conduit, fuel discharge means in said conduit, said plate inclined toward said fuel discharge means, and provided with openings in proper relation thereto, and an auxiliary air valve opening into said conduit, said auxiliary valve being arranged to respond to engine suction, a control for fuel supply, fuel controlling devices between said valve and said fuel supplying means, said devices including a shaft, a cam bearing arm loose on said shaft, an arm fixed on said shaft, means on said last named arm adapted for contacting engagement with said first named arm, a shaft on which said auxiliary valve is secured, an arm on said valve shaft, and a pin on said arm adapted to be engaged by said cam, the parts being so positioned that when the cam rests on said pin in idle position the contacting engagement aforesaid is avoided.

14. In a fuel feeding device for an internal combustion engine, in combination, an intake conduit for said engine, a deflecting plate fixed in said conduit, fuel discharge means in said conduit, said plate inclined toward said fuel discharge means, and provided with openings in proper relation thereto, and an auxiliary air valve opening into said conduit, said auxiliary valve being arranged to respond to engine suction, a control for fuel supply, fuel controlling devices between said valve and said fuel supplying means, said devices including a shaft, a cam bearing arm loose on said shaft, an arm fixed on said shaft, means on said last named arm adapted for contacting engagement with said first named arm, a shaft on which said auxiliary valve is secured, and a device for locking said arm bearing shaft from movement to open the fuel supply devices while the throttle is open.

15. In a fuel supplying device for internal combustion engines, in combination, means for supplying fuel in response to engine suction, means manually operative to permit increase in fuel supply for priming purposes, a throttle valve, and means connected with said valve to render inoperative said manually operative means.

16. In a fuel supplying device for internal combustion engines, in combination, means for supplying fuel in response to engine suction, means manually operative to permit increase in fuel supply for priming purposes, a throttle valve, means connected with said valve to render inoperative said manually operative means, and an adjustable stop for limiting the throttle closure.

17. In combination, in a fuel supply device

for internal combustion engines, an intake conduit, jets for supplying fuel to said conduit, a valve, means for supplying air through said valve in quantity differentially proportioned with the fuel supply to engine needs, means for adjusting the supply of air and fuel to the needs of an engine of any particular type, a casing for sealing the parts so adjusted and their adjusting devices, and additional adjusting means outside said casing for wear, climate and fuel adjustment.

18. In a fuel supplying device for internal combustion engines, a supply tank, and in combination therewith fuel discharge pipes, said pipes being also provided with tubes of capillary dimensions, said tubes being provided with square-edged slots at the upper end, opening to the channels thereof.

19. In a fuel supplying device for internal combustion engines, a supply tank, and in combination therewith fuel discharge pipes, said pipes being provided with tubes of capillary dimensions, said tubes being also provided with square-edged slots at the upper end, opening to the channels thereof, and means for controlling the dimensions in one direction of said slots.

20. In a fuel supplying device for internal combustion engines, in combination, an intake conduit, means for checking the flow of air through said conduit, an auxiliary valve arranged to open when engine suction beyond a certain point occurs and to close when suction falls below said point, means connected with said auxiliary valve for controlling fuel supply in proportion to suction, and a fly-wheel in said means for delaying the response of said valve to suction and its return when suction is absent.

21. In a fuel supplying device for internal combustion engines, having fuel supply openings, in combination, a conduit, a deflecting plate arranged in said conduit to deflect air toward said fuel supply openings, said deflecting plate being secured to the bottom of the conduit and arranged to engage with the top of the conduit and having openings arranged in the upper part thereof in position to localize with reference to said fuel discharge openings, currents of air passing through said conduit.

In testimony whereof, I affix my signature, in presence of two witnesses.

HENRY M. REICHENBACH.

Witnesses:
JOHN A. BEIRNS,
FRED W. HAWES.