Feb. 7, 1928.

1,658,026

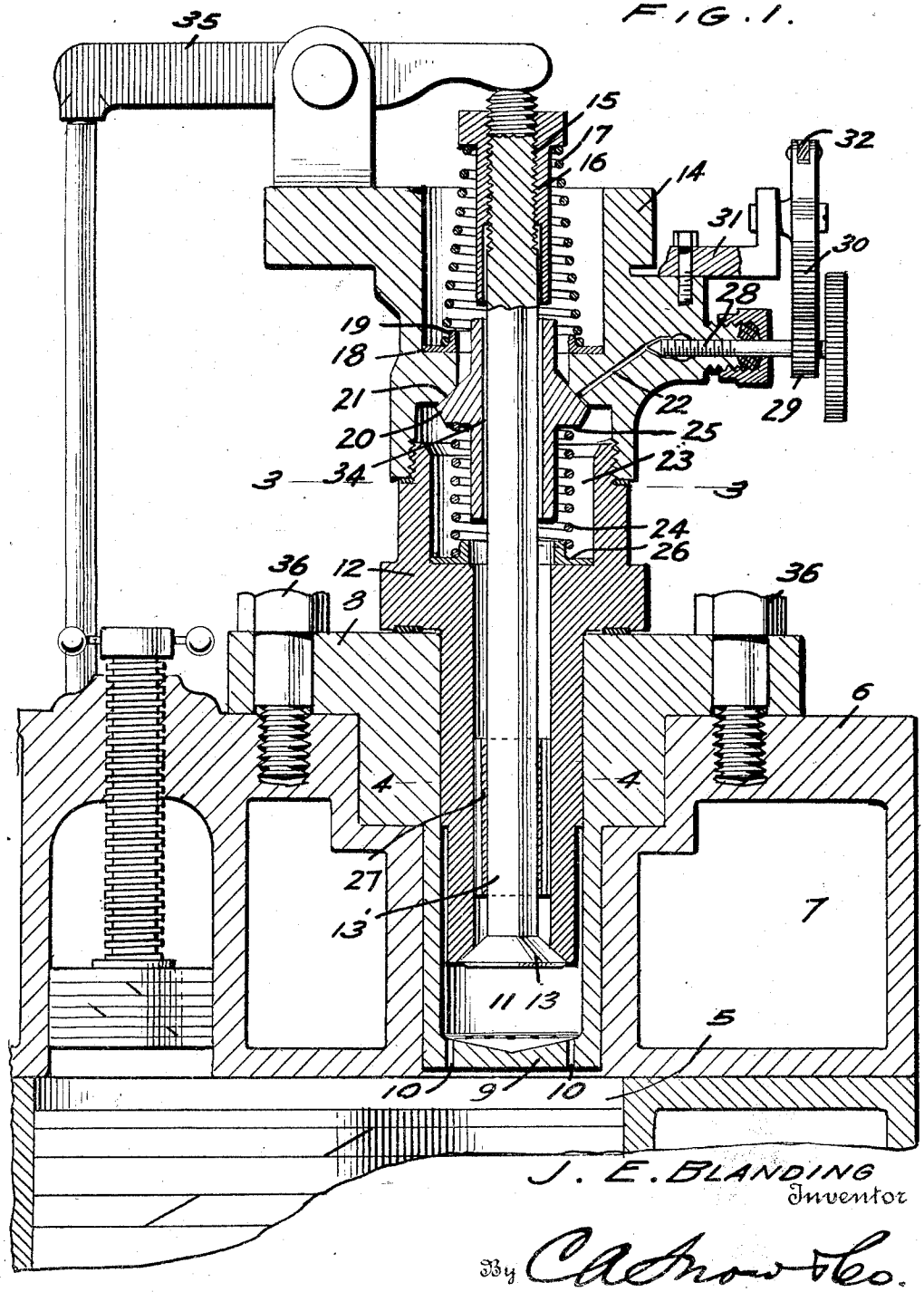
J. E. BLANDING

FUEL FEED DEVICE

Filed Oct. 20, 1926

2 Sheets-Sheet 1

FIG. 1.



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FIG. 2.

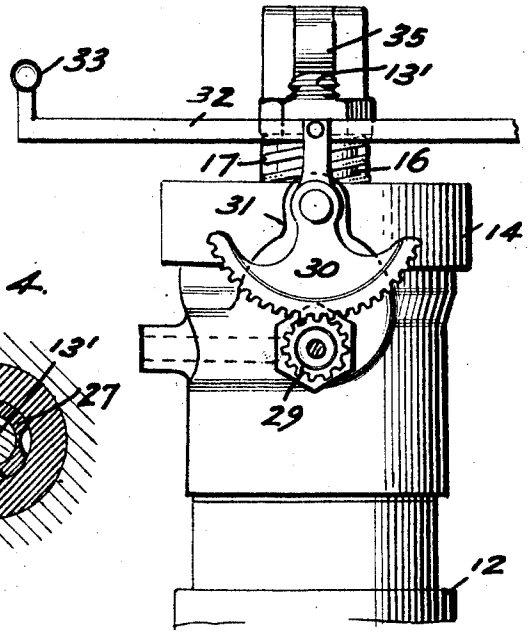


FIG. 4.

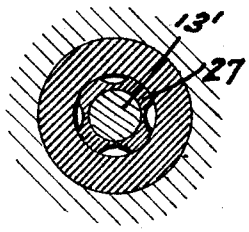


FIG. 5.

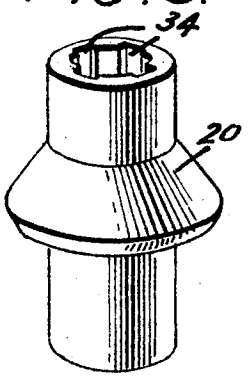
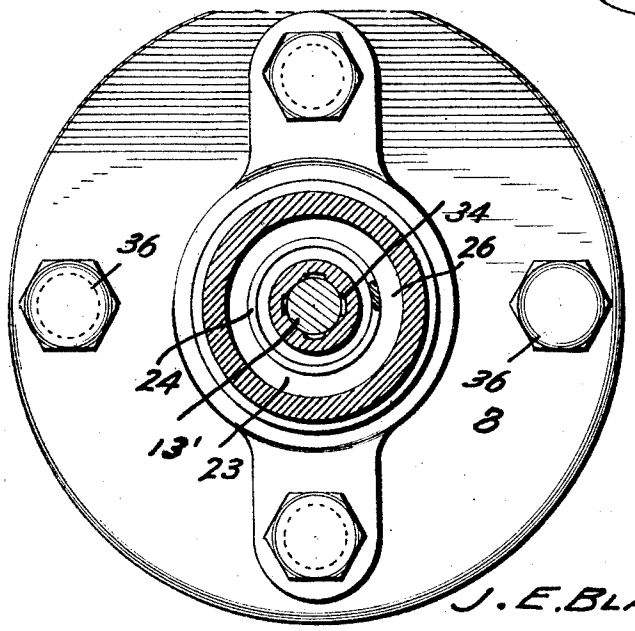


FIG. 3.



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UNITED STATES PATENT OFFICE.

JOSEPH E. BLANDING, OF NEW LONDON, CONNECTICUT.

FUEL-FEED DEVICE.

Application filed October 20, 1926. Serial No. 142,942.

This invention has reference to internal combustion engines and aims to improve generally the construction as shown in my pending application Serial Number 9,818, filed February 17, 1925.

An important object of the invention is to provide a continuous compression retaining valve stem carrying a valve at its lower end, the upper end of the valve stem extending through the upper portion of the valve support and cage to be operated on by the usual rocker arm employed in internal combustion engines.

A further object of the invention is to provide a two-piece valve supporting structure which may be readily and easily removed and replaced to facilitate the cleaning and repairing of the device.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, may be made within the scope of what is claimed, without departing from the spirit of the invention.

Referring to the drawings:

Figure 1 is a longitudinal sectional view through the upper portion of a cylinder head equipped with a device constructed in accordance with the present invention.

Figure 2 is a side elevational view of the device.

Figure 3 is a sectional view taken on line 3—3 of Figure 1.

Figure 4 is a sectional view taken on line 4—4 of Figure 1.

Figure 5 is a perspective view of the fuel controlling valve forming a part of the invention.

Referring to the drawings in detail, the reference character 5 designates the upper portion of an internal combustion engine cylinder and the reference character 6 indicates a portion of the removable head thereof.

The head is provided with the usual water jacket 7, and as shown, the head is provided with a cut out portion designed to receive the cage 8 or support for the valve cage portion of the device.

The lower end of the cage is closed as by means of the wall 9, which wall is provided with a plurality of openings 10 establishing communication between the chamber 11 and cylinder, so that fuel passing into the chamber 11 may be passed into the cylinder for supplying the charge to be fired.

As clearly shown by Figure 1, the valve cage forming an important feature of the invention is elongated, the same being indicated by the reference character 12, the lower end of the valve cage terminating in spaced relation with the wall 9 to provide the chamber 11.

The lower end of the valve cage is tapered to provide a seat for the valve 13 and stem 13′, which is of a length to extend upwardly through the valve cage and through the fuel valve cage or support 14. Threads 15 are provided at the upper end of the valve stem 13′ and accommodate the sleeve 16 which is formed with a shoulder defining a seat for the upper end of the coiled spring 17, the lower end of the coiled spring resting on the washer 18 which has an upwardly extended flange 19.

Loosely mounted on the stem 13′ is the fuel controlling valve 20 that seats at 21 the seat being substantially wide, to the end that the bore 22 through which fuel passes to the valve, may pass therethrough.

The upper portion of the valve cage is cut away as at 23 to provide a housing for the coiled spring 24 that has its upper end engaging the shoulder 25 of the fuel feed valve 20, the lower end of the spring resting on the washer 26.

From the foregoing it will be seen that the valve 20 may seat to control the passage of fuel through the bore 22, the action of the valve being controlled by the tension of the coiled spring 17. The upper end of the valve 20 normally lies in spaced relation with the lower end of the sleeve 16 and during the operation of the device, it will be seen that the sleeve 16 moves downwardly with the valve stem, whereupon the lower end of the sleeve engages the upper end of the valve 20 to unseat the same.

By adjusting the sleeve 16 the tension of the spring 17 may be regulated and the valve may be operated at various intervals.

Mounted within the valve cage is a guide member 27 through which the valve stem 13′ moves, the valve guide having lateral lon-

gitudinal passageways to permit the fuel to pass through the valve cage during the suction stroke of the piston.

Operating to control the passage of fuel through the valve is a valve member 28 which is provided with a pinion 29 that meshes with the segmental rack 30 supported by means of the bracket 31.

The rack 30 is operated by means of the throttle rod 32, the same being supplied with a counterbalancing weight 33 to facilitate the operation of the valve 28.

It might be further stated that the valve 20 is of a novel construction, the same being provided with longitudinal internal bores or grooves 34 providing passageways between the stem 13′ and the body of the valve 20, to the end that air may enter between the valve and stem 13′.

Operating at the upper end of the valve stem 13 is a rocker arm 35 that has one of its ends contacting with the upper end of the valve stem 13′ as shown by Figure 1, the opposite end thereof being engaged by the usual push rod which in turn is operated in the usual and well known manner.

In order that the device may be readily secured to a cylinder, bolts 36 are provided and pass through openings in the cage 8.

I claim:

1. In a device of the character described, a cylinder, a valve cage support mounted in the cylinder, a valve cage within the valve cage support, a fuel valve cage mounted on the first mentioned cage, a valve stem extended through the cages and carrying a valve at its lower end adapted to seat at the lower end of the first mentioned cage, a valve slidable on the valve stem, springs operating at opposite sides of the valve, one of said springs adapted to normally urge the last mentioned valve to its seat, means operating against the tension of the opposite spring to unseat the last mentioned valve, and means for operating the valve stem and valves.

2. In a device of the character described, a cylinder, a valve cage support mounted within the cylinder, a valve cage mounted within the valve cage support, an upper valve cage removably supported on the elongated valve cage, a valve seat formed at one end of the first mentioned valve cage, a valve stem carrying a valve adapted to seat on the valve seat, said valve stem being of a diameter less than the diameter of the valve cages, to allow a charge to pass through the valve cages, a valve seat formed on the second mentioned valve cage, a valve slidable on the valve stem and spring pressed to normally seat on the second mentioned valve seat, means for adjusting the movement of the last mentioned valve, and means for operating the valve.

3. In a device of the character described, a valve cage support removably supported on an engine cylinder, a valve cage positioned in the valve cage, support, a valve stem having a valve at its lower end adapted to cooperate with one end of the valve cage to control the passage of fuel through the valve cage, a valve cage removably supported on the first mentioned valve cage, a valve slidable on the first mentioned valve and operating to control the passage of fuel through the second mentioned valve cage, the second mentioned valve cage having a seat against which the slidable valve seats, said second mentioned valve cage having a bore extending to the valve seat thereof, and adapted to supply liquid fuel to the valve cages, and means for operating the valves.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

JOSEPH E. BLANDING.