

April 19, 1949.

J. E. BLANDING

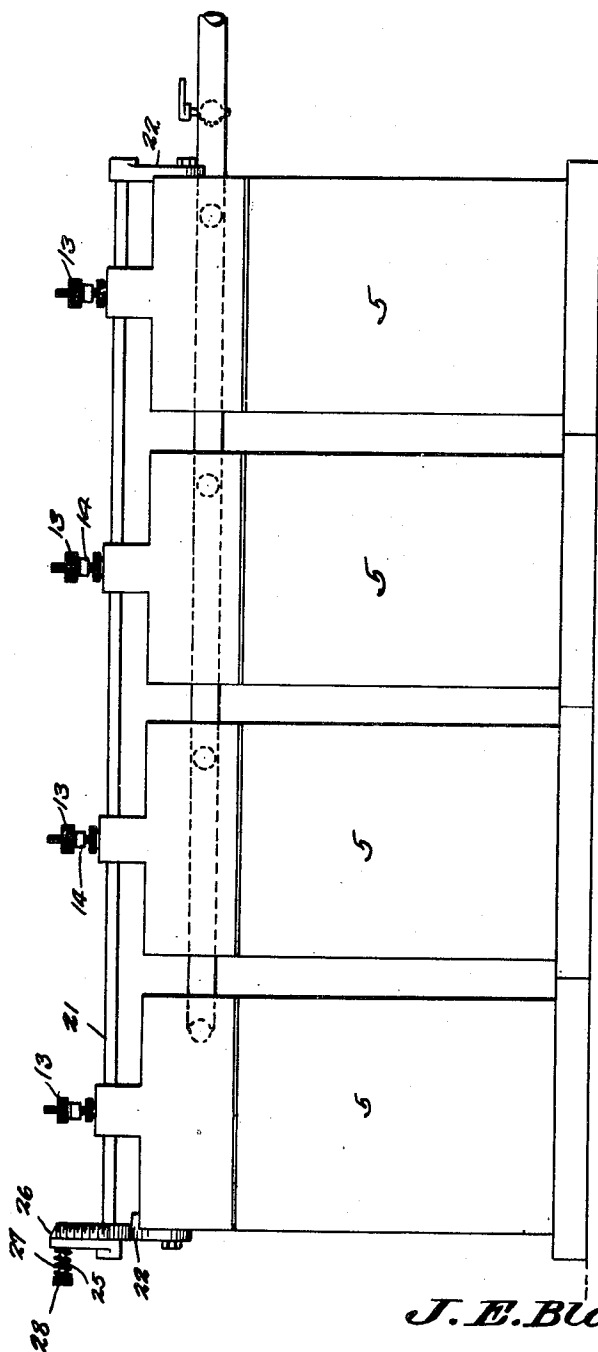
2,467,461

CONTROL DEVICE FOR VALVES

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2 Sheets-Sheet 1

*Fig. 1.*



*J. E. Blanding,*  
INVENTOR.

BY

*Chas. H. Co.*

April 19, 1949.

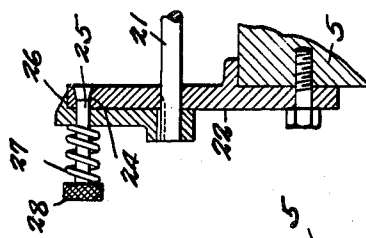
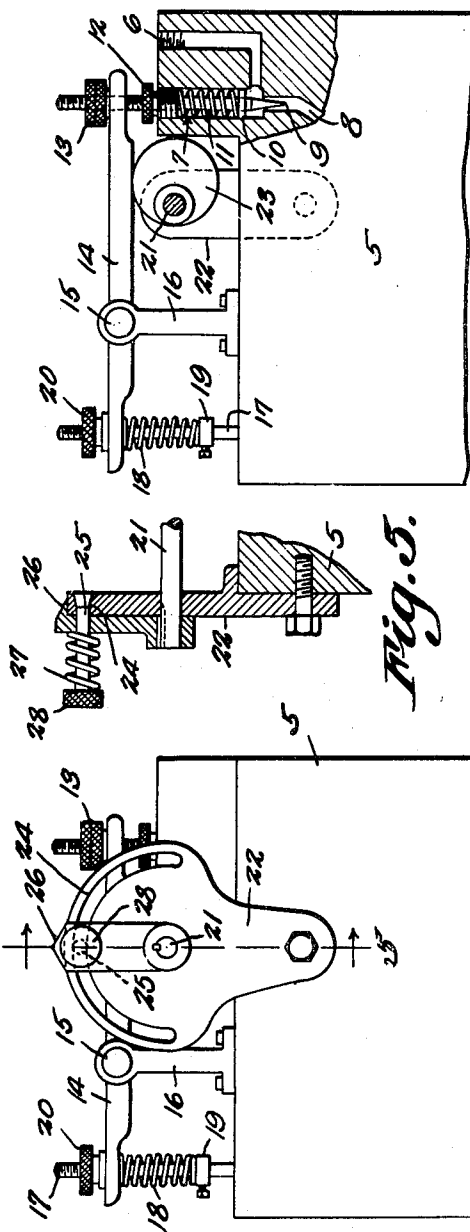
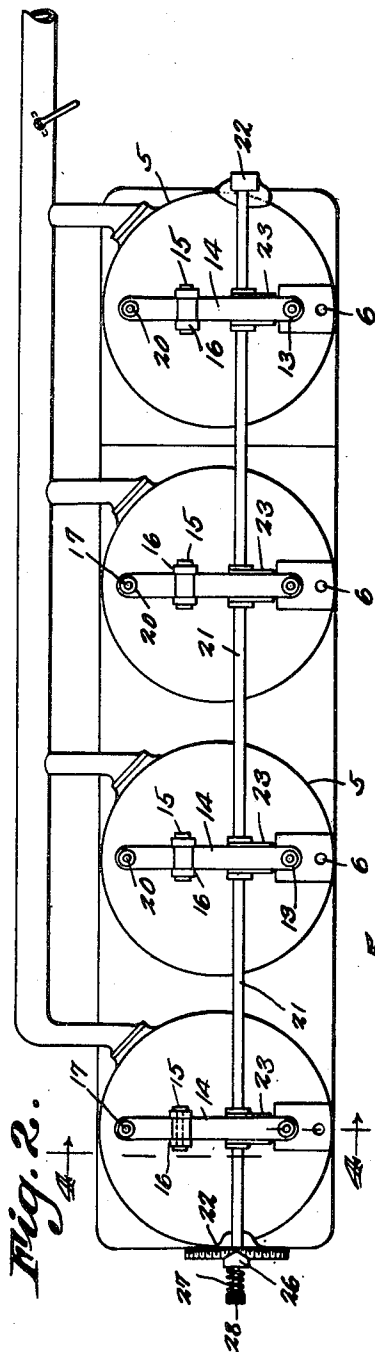
J. E. BLANDING

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CONTROL DEVICE FOR VALVES

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2 Sheets-Sheet 2



J. E. Blanding,  
INVENTOR.

BY

Chas. Snow & Co.

## UNITED STATES PATENT OFFICE

2,467,461

## CONTROL DEVICE FOR VALVES

Joseph Edward Blanding, New London, Conn., assignor of one-half to Patrick B. McNamara, Groton, Conn.

Application January 14, 1943, Serial No. 472,382

2 Claims. (Cl. 137-144)

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This invention relates to a control device for valves of internal combustion engines of the type shown and described in my pending application, Serial No. 457,861, filed September 10, 1942, now Patent Number 2,352,682, granted July 4, 1944, the primary object of the invention being to provide means for feeding the oil fuel to the engine, in such a way that the amount of oil entering the engine may be accurately regulated, for the efficient operation of the engine.

Another important object of the invention is to provide a needle valve control means designed for manually shutting the valve to regulate the movement of the valve, and consequently regulate the quantity of fuel oil entering the engine, to insure the thorough mixing of the fuel oil and air to provide perfect combustion under varying conditions of use.

Still another object of the invention is to provide exceptionally simple means for accomplishing adjustment of the valve, eliminating complicated valve control mechanisms, which are frequently rendered inoperative.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts herein-after more fully described and pointed out in the claims, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

Referring to the drawings,

Figure 1 is an elevational view illustrating engine cylinders, equipped with the improved structure, forming the subject matter of the present invention.

Figure 2 is a plan view thereof.

Figure 3 is an end elevational view of the device.

Figure 4 is a sectional view taken on line 4-4 of Figure 2.

Figure 5 is a sectional view taken on line 5-5 of Figure 3.

Referring to the drawing in detail, the reference character 5 designates the engine cylinders of a four-cylinder engine. Each cylinder head is provided with a fuel inlet port 6 which communicates with the charge-forming device of the engine, through the valve chamber 7, and passageway 8, the valve chamber 7 being provided with a valve seat at its base, to be engaged by the needle valve 9 which has one end thereof, extended into the passageway 8.

A flange indicated at 10 is formed on the needle valve, and provides a stop for the lower end of

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the coiled spring 11 which has its upper end engaging the threaded member 12, whereby the tension of the spring may be regulated. The member 12 is fitted in threads formed on the wall of the valve chamber 7.

An adjusting nut 13 is provided on the threaded extremity of the needle valve 9, and provides a stop against which the rocker arm 14 engages, elevating the needle valve to admit a quantity of oil to the passageway 8.

The rocker arm 14, is pivotally mounted on the shaft 15 which in turn is supported by the bracket 16 associated therewith, which bracket is mounted on the cylinder head. As shown, the rocker arms 14 of a multi-cylinder engine, are pivotally supported at a point nearer to one end than the other, leaving a substantially long portion of the rocker arm at one side of the shafts 15.

The reference character 17 designates push rods which extend through openings in one end of the respective ends of the rocker arms associated therewith, there being provided a coiled spring 18 mounted on each push rod, the spring having its upper end bearing against the push rod, while the lower end thereof rests on the adjustable collar 19 secured to the push rod. A nut indicated at 20 is mounted on the threaded upper end of each push rod and is adapted to engage its rocker arm, adjusting the tension of the spring 18.

The regulating device, forming the essence of the present invention, includes a shaft 21 that extends over the cylinder block of the engine, the ends thereof being mounted in brackets 22 that are supported at the ends of the cylinder blocks. Secured to the shaft 21, are cams 23 that are disposed directly under the rocker arms of the engine, the cams operating to elevate the rocker arms, and consequently raise the needle valves with which the rocker arms are connected, adjusting the initial positions of the needle valves.

The bracket 22 at one end of the cylinder block, is substantially wide and is provided with an arcuate shaped slot 24 disposed adjacent to the curved upper edge thereof, the slot 24 being designed to accommodate the bolt 25 on which the indicator 26 is mounted. The indicator 26 is also keyed to the shaft 21 to move therewith.

A coiled spring indicated at 27 is mounted on the bolt 25 and bears against the indicator 26, holding the indicator into close engagement with the bracket 22 associated therewith. The outer end of the spring 27 engages the head 28 when secured to the outer end of the bolt 25, the head providing a finger piece, whereby the bolt 25, together with the indicator 26, may be swung

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throughout the length of the slot 24 to adjust the shaft 21, and consequently adjust the positions of the cams 23 mounted thereon. Graduations are formed along the upper curved edge of the wide bracket 22, which graduations cooperate with the indicator in determining the degree of movement of the shaft 21.

From the foregoing it will be seen that due to the construction shown and described, the attendant or operator of the engine, may, by rotating the shaft 21, move the various cams throughout the length of the cylinder block simultaneously, thereby insuring an accurate adjustment of all of the needle valves controlling the flow of fuel oil, to the charge-forming devices of the various cylinders.

In the operation of the engine, the push rods 17 move downwardly, rocking the arms 14 to elevate the needle valves connected therewith. When the cams have been adjusted to vary the initial flow of oil to the cylinders, it will be seen that the distance of opening of the needle valves may be regulated.

With the structure shown by applicant, the valves may be adjusted so that they will be maintained open a predetermined distance, at all times, or may be moved so that the initial positions of the needle valves, will close the valve chambers to exclude the passage of oil into the charge-forming devices.

What is claimed is:

1. A control device for valves of internal combustion engines, comprising a plurality of needle valves, a pivoted rocker arm operatively connected with each needle valve, rocker arm adjusting means embodying a horizontal shaft disposed under the rocker arms, cams secured to the shaft, each cam contacting with the lower surface of its respective rocker arm, said cams restricting movement of the rocker arms, and said shaft and

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cams adapted to be rotated thereby to simultaneously adjust the operating positions of the needle valves regulating the passage of fuel through the valves.

2. A fuel control means for valves of internal combustion engines, comprising a plurality of needle valves, a pivoted rocker arm operatively connected with each of said needle valves, a support for each rocker arm, rocker arm adjusting means embodying a horizontal shaft, cams secured to said shaft, each of said cams being mounted under its respective rocker arm in contact therewith at a point between the support and valve, said cams restricting the throw of said rocker arms thereby to simultaneously adjust the positions of the needle valves when the shaft is rotated, regulating the passage of fuel through the valves.

JOSEPH EDWARD BLANDING.

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