

No. 650,266.

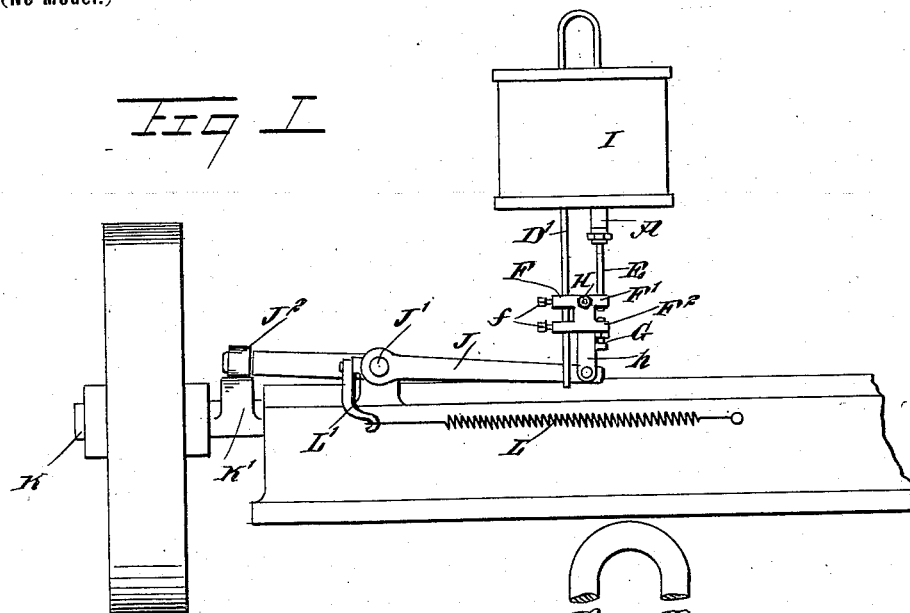
Patented May 22, 1900.

W. J. McDUFF.  
FEED FOR EXPLOSION ENGINES.

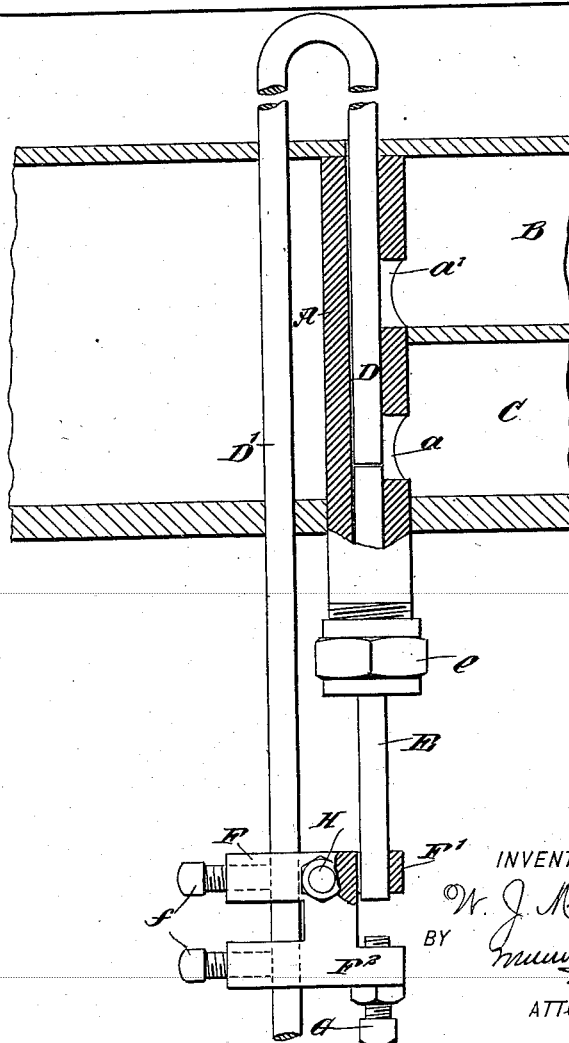
(Application filed Oct. 5, 1899.)

(No Model.)

2 Sheets—Sheet 1.



*Fig 2*



WITNESSES:

*H. Walker*  
*H. L. Reynolds.*

INVENTOR

*W. J. McDuff*

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Fig 3

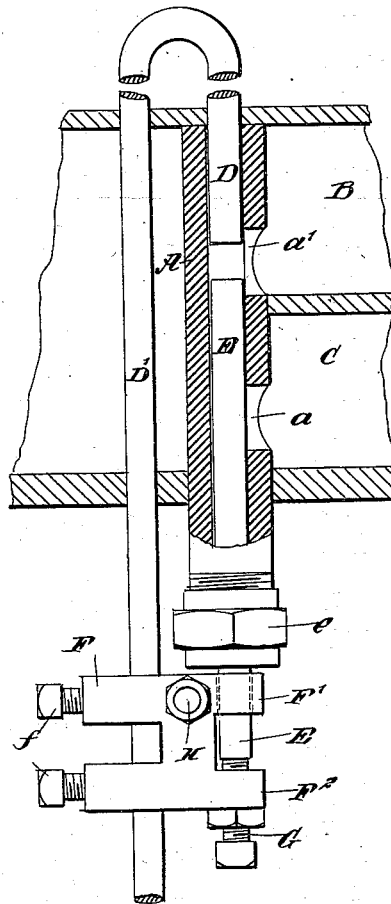
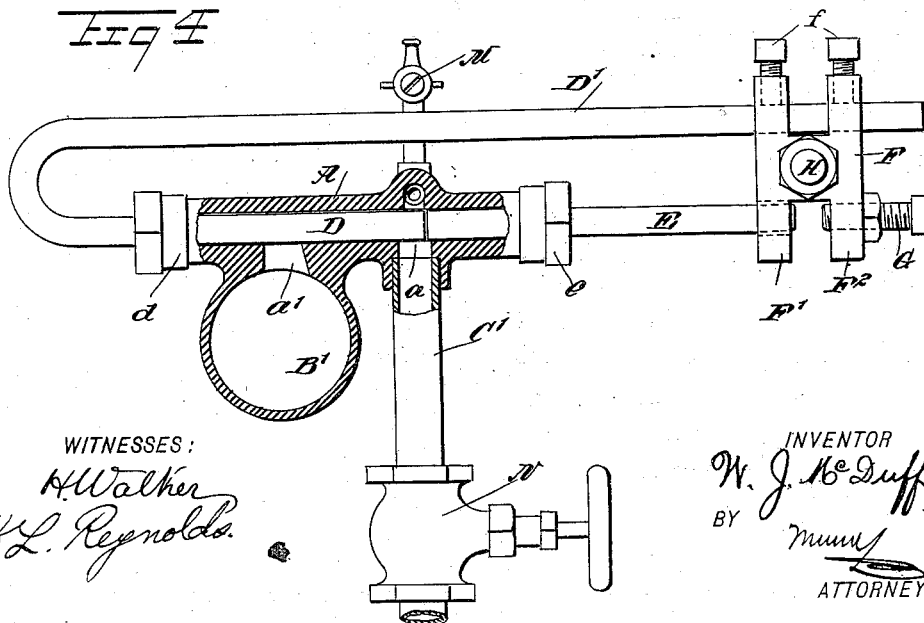


Fig 4



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# UNITED STATES PATENT OFFICE.

WILLIAM JOHN McDUFFE, OF TILTON, NEW HAMPSHIRE.

## FEED FOR EXPLOSION-ENGINES.

SPECIFICATION forming part of Letters Patent No. 650,266, dated May 22, 1900.

Application filed October 5, 1899. Serial No. 732,652. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM JOHN McDUFFE, of Tilton, in the county of Belknap and State of New Hampshire, have invented a new and Improved Feed for Explosion - Engines, of which the following is a full, clear, and exact description.

My invention relates to an improvement in feed devices for supplying the oil or gasolene used in explosion-engines, the object being to provide a feed which may be regulated while the engine is running and which will accurately supply an exact amount of the oil or gasolene to the engine.

My invention comprises the novel features hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side view of a portion of an engine, showing my device attached thereto and the manner of operating it. Fig. 2 is a detail side elevation and partial section showing my device. Fig. 3 is a similar view showing the parts in a different position, and Fig. 4 is a similar view showing the device mounted in a slightly-different manner.

In the operation of gasolene and similar explosion-engines in which an oil is used for obtaining power it is very important that the amount of oil furnished at each stroke shall be capable of exact regulation and that the same amount shall be furnished at each stroke.

This object is what is sought to be accomplished by my device. The device is, essentially, a pump of a peculiar construction which forces a definite amount of oil into the passages connected either with a carbureting device or with the cylinder of the engine.

The cylinder A of the pump is open at both ends and is provided with two side extending ports *a* and *a'*, the port *a* communicating with a passage C, which contains the oil which is to be introduced to the engine. The port *a'* communicates with a passage B, which leads either to a carbureting device or directly to the cylinder of the engine. The two ports *a* and *a'* are arranged in the same side of the cylinder—that is, they aline lengthwise of the cylinder.

Within the cylinder A are two plungers D

and E, which fit the cylinder and completely fill the space therein. If desired, the ends of the cylinder A may be provided with stuffing-boxes or glands *d* and *e*, only one of which is shown in Fig. 2, which surround the two plungers and prevent any possibility of leakage around the same. The plunger D is positively connected with a cross-head or block F, which is connected by means of a pin H or in any other suitable manner with the operating means therefor. This operating means may be of any suitable construction, said construction varying with the position of the feeding device and with the type of engine. The means used for operating the pump does not form any essential part of my invention.

The means for operating the pump shown in Fig. 1 consists of a lever J, which is pivoted at J' to the frame of the engine and has a link *h* connected with one end thereof and with the pin H upon the cross-head or block F. The other end of the lever is provided with a roller J<sup>2</sup>, which engages a cam K' upon the engine-shaft K. An arm L', extending from the lever J, has a spring L attached thereto and adapted to cause the movement of the pump in one direction and to hold the roller J<sup>2</sup> in engagement with the cam K'. The cross-head F, as herein shown, is provided with an aperture or apertures adapted to receive the end of the plunger D, which for this purpose is bent backward upon itself at D' into the shape of an inverted letter J and is secured in place in the cross-head by means of set-screws *f*. The plunger E, which projects from the opposite end of the cylinder A, passes through an opening in an arm F' upon the block F, which opening is of such size that the plunger may slide freely therein. In an arm F<sup>2</sup> opposite the arm F' is placed a set-screw G, which is provided with a lock-nut, so that it may be securely held in any adjusted position. This set-screw is in line with the plunger E and is adapted to engage the end thereof to carry the plunger in one direction. The plunger E is moved in the other direction by abutting engagement with the end of the plunger D.

The operation of my device is as follows: In the position shown in Fig. 2 the abutting ends of the two plungers lie within the port *a*, which communicates with the oil-supply.

When the cross-head F is moved upwardly, the plunger D moves promptly therewith, as it is fixedly secured to the cross-head, while the plunger E does not start to move until it is engaged by the set-screw G. In consequence of this the inner ends of the two plungers are separated, and when the plunger E is carried along an amount of oil is carried with it equal to the space between the ends of the plungers. The movement of the plungers within the cylinder is sufficient to carry the abutting ends of the plungers from one port to the other. The other limit of the stroke of the plungers is shown in Fig. 3. Upon the return stroke of the cross-head the plunger D moves off promptly, while the plunger E is held against moving until it is engaged by the end of the plunger D. This forces the oil between the two plungers out into the chamber B, which is in communication with a carbureting device or with the cylinder of the engine. The amount of oil delivered is controlled by adjusting the slack between the two plungers by means of the set-screw G. This may be readily done while the engine is in motion, as the stroke of the plunger is comparatively slight.

In Fig. 4 the device is shown mounted in a different manner. In this case the plungers are placed over the passage B', which communicates with the engine-cylinder, and the oil is supplied through a pipe C', which is provided with a throttle-valve N, by which the oil-supply may be cut off when desired. In this figure a vent-cock M is shown as connected with the port a, so that any air which may enter the oil-supply pipe may be promptly blown out.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A pump comprising a cylinder having inlet and discharge ports, a plunger fitted to slide in said cylinder and projecting therefrom at one end, said projecting portion of the plunger having a return member extending longitudinally of the cylinder on the outside thereof, a reciprocating actuating member to which the return member of said plunger is secured, said actuating member being pro-

vided with an adjusting-screw forming an abutment and extending lengthwise with respect to the cylinder, and a second plunger likewise fitted to slide in the cylinder and adapted to engage said adjustable abutment-screw, the length of said second plunger being smaller than the distance between the inner end of the first plunger and the screw of the actuating member.

2. A pump comprising a cylinder having side inlet and discharge ports, plungers fitting said cylinder and projecting from opposite ends thereof, said plungers being movable to transfer their abutting ends from one port to the other, and an actuating member having a positive connection with one of said plungers, and provided with an adjustable member abuttingly engaging the outer end of the other plunger, whereby the slack between the plungers may be adjusted, substantially as described.

3. A pump comprising a cylinder having inlet and discharge ports, two plungers fitting said cylinder and movable to transfer their inner ends from one port to the other, an actuating member having positive connection with one of said plungers and an adjustable member forming a slack connection from the other plunger to the actuating member, whereby the slack between the plungers may be adjusted, substantially as described.

4. A pump comprising a cylinder having side inlet and discharge ports, two plungers fitting said cylinder and projecting from opposite ends thereof, said plungers being movable to transfer their abutting inner ends from one port to the other, an actuating member having a positive connection with one of said plungers, said actuating member having a guide receiving an end of the other plunger, and an adjusting-screw secured to the actuating member and adapted to engage the outer end of said plunger, whereby the slack between the two plungers may be adjusted, substantially as described.

WILLIAM JOHN McDUFF.

Witnesses:

ARTHUR M. LORD,  
ARTHUR T. CASS.