

No. 868,371.

PATENTED OCT. 15, 1907.

H. TABOR.  
VALVE GEAR FOR EXPLOSIVE ENGINES.

APPLICATION FILED MAR. 6, 1905.

2 SHEETS—SHEET 1.

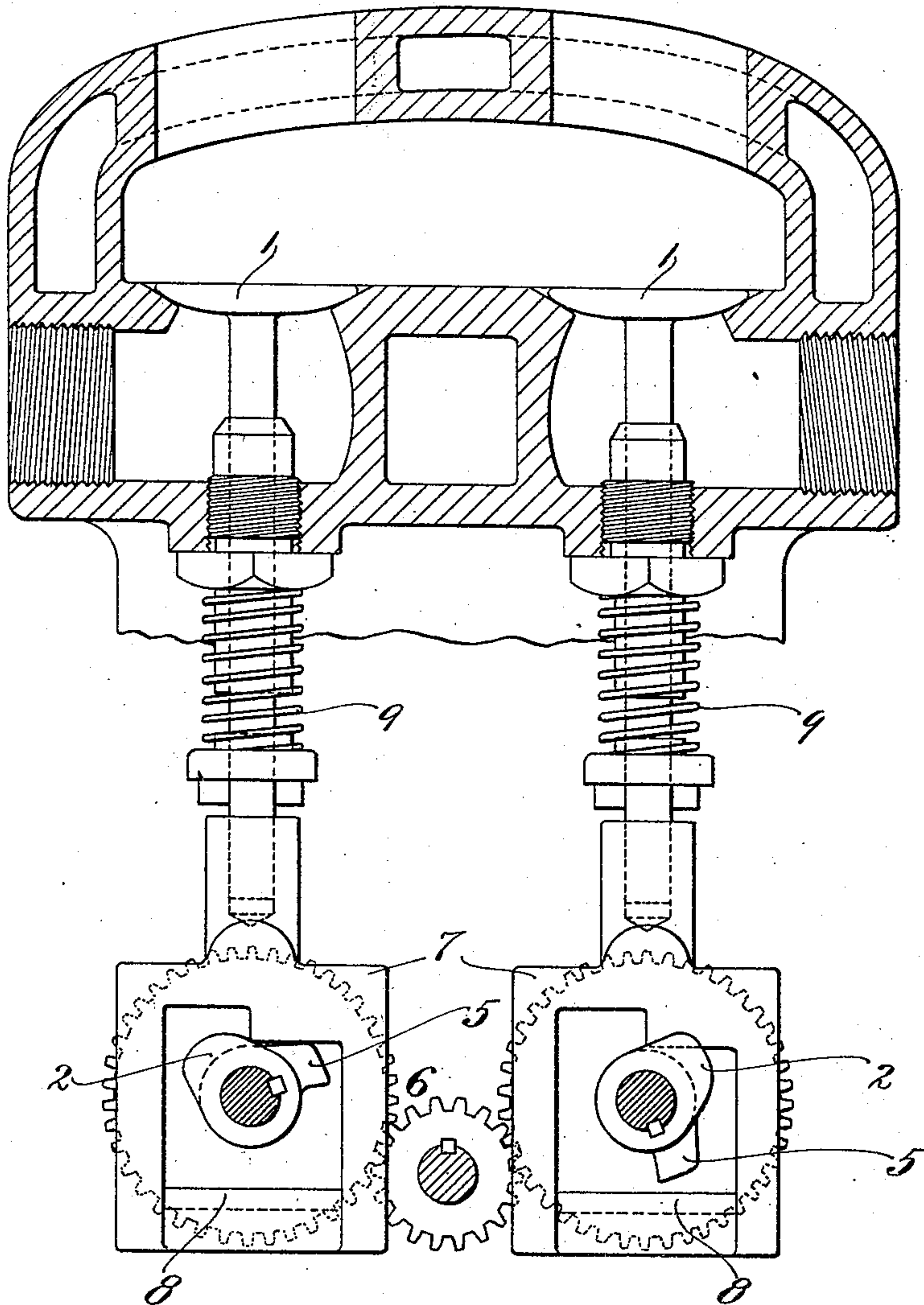


Fig. 1

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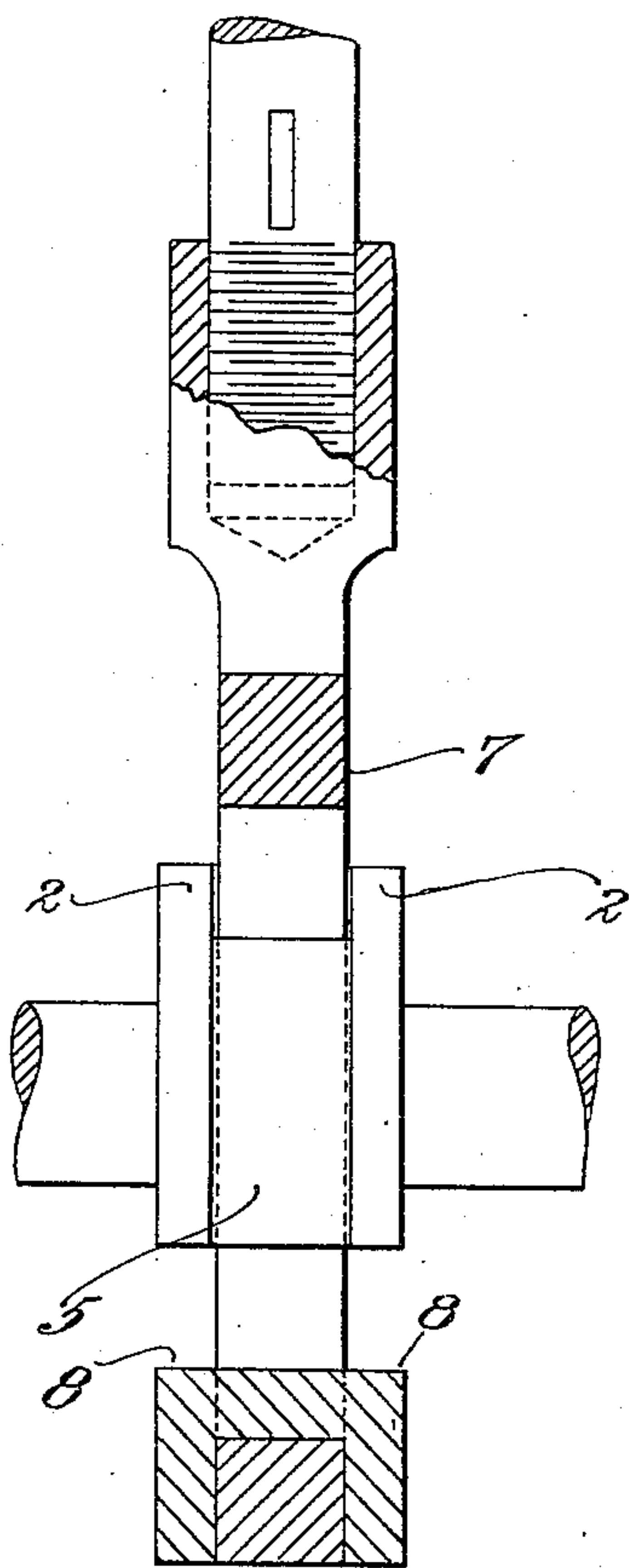


Fig. 2.

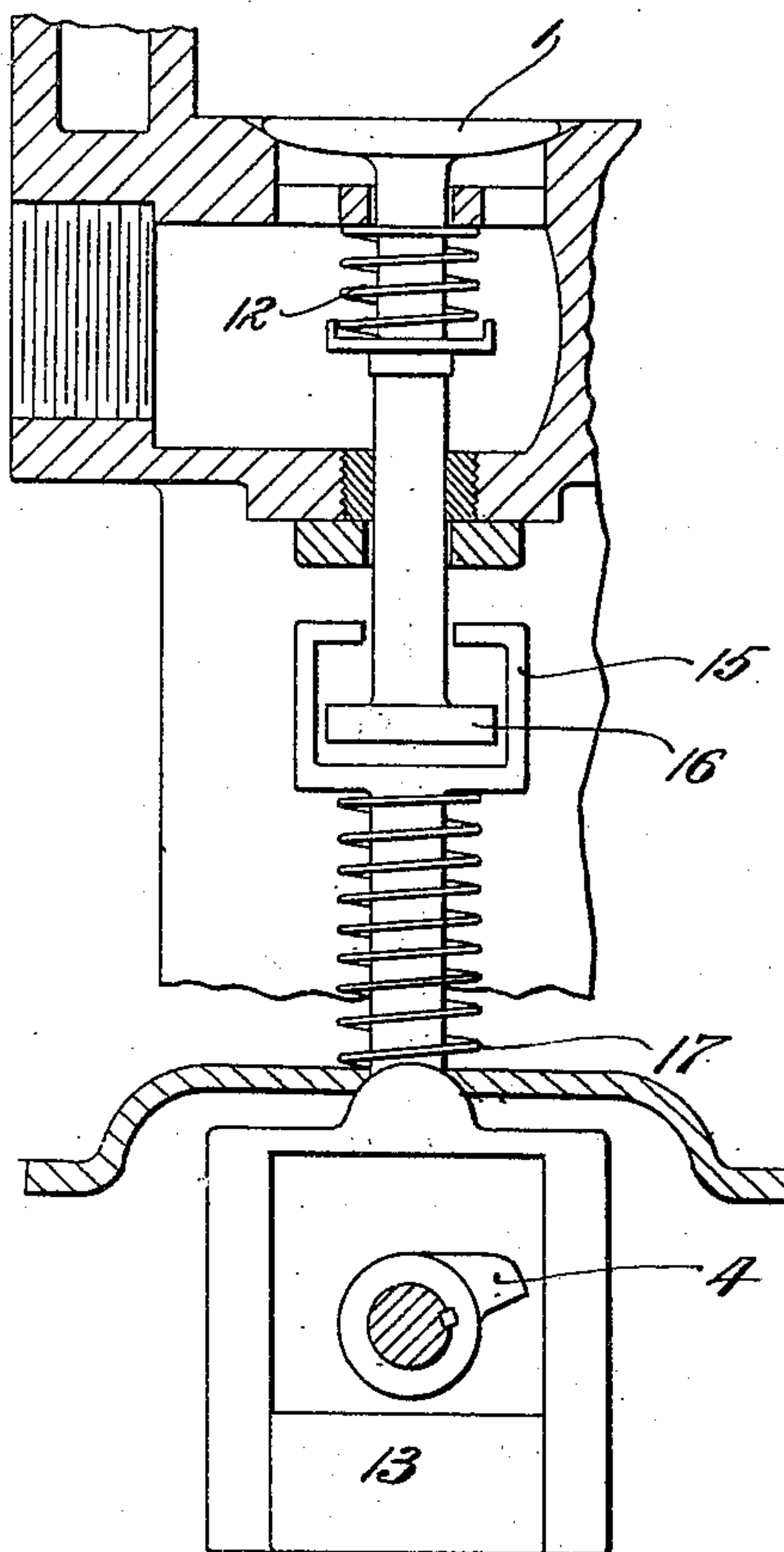


Fig. 3.

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# UNITED STATES PATENT OFFICE.

HARRIS TABOR, OF ELIZABETH, NEW JERSEY.

## VALVE-GEAR FOR EXPLOSIVE-ENGINES.

No. 868,371.

Specification of Letters Patent.

Patented Oct. 15, 1907.

Application filed March 6, 1905. Serial No. 248,371.

*To all whom it may concern:*

Be it known that I, HARRIS TABOR, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain  
5 new and useful Improvements in Valve-Gears for Explosive-Engines, of which the following is a specification.

It is desirable, for example in automobile, motor boat and other practice, to make such engines comparatively small and to run them at high speed so as to obtain as much power as possible in proportion to weight. Under such circumstances it is obvious that the movement of admission and exhaust valves is necessarily exceedingly rapid so that their inertia becomes a matter of some importance in that it retards their closing movement so that they do not close at the appropriate point of the stroke, thus in the case of the admission valve causing the expulsion past the valve of a part of the charge and in the case of the exhaust valve of the  
10 return past the valve of a part of the exhaust, and in each case the efficiency of the engine is diminished.

Objects of the present invention are to obviate these defects and disadvantages and to close the valves at appropriate points of the stroke even when the engine is  
15 running at very high speed and the movements of the valves are exceedingly rapid, and to provide for overcoming the inertia of the opening valves for starting them to move quickly toward their closed positions.

To these and other ends hereinafter set forth, the invention comprises the improvements to be presently described and finally claimed.

The nature, characteristic features and scope of my invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof and in which  
20

Figure 1, is a view, principally in section, illustrating mechanism embodying features of the invention. Fig. 2, is a side elevation drawn to an enlarged scale and illustrating partly in section a portion of the apparatus shown in Fig. 1, and Fig. 3, is a view illustrating mechanism embodying a modification of the invention.

In the drawings 1, are the valves and they are of puppet type. As shown in Figs. 1 and 2, they are of the mechanically operated type, that is to say, they are  
25 opened by a cam or the like as will be described. As shown in Fig. 3, they are shown as of the automatically operated type, that is to say, they are opened by the incoming mixture.

A description will now be given of means for insuring closure of the valves at the appropriate point of the engine stroke. As shown in Figs 1 and 2, these means

comprise cams 2, whose function it is to overcome the inertia of the opening valves and start them to close. In Fig. 3, these means comprise a cam 4, together with its accessories which will be described.

Referring to Figs. 1 and 2, the cams 5, are carried by shafts which are driven through the instrumentality of suitable gearing 6, from an appropriate part of the engine or a device connected therewith, and they cooperate with yokes 7, attached to the valve spindles. These  
30 cams 5, serve to elevate the valves so that the latter are mechanically opened. The cams 2, are also connected with these shafts and they cooperate with the parts 8, of the yokes and these serve to overcome the inertia of the valves and effect their closure at the appropriate points in the stroke. Springs 9, when present, serve to enable the parts to operate in any position and also tend to close the valves and keep them upon their seats.

As shown in Fig. 3, the valve is raised overcoming the spring 12, but at the limit of its motion, the cam 4, carried by a shaft appropriately driven from the engine, operates upon the part 13, of the yoke 14, and thus causes the fork 15, carried by the yoke to collide with the head 16, of the spindle and thus quickly start the  
35 valve towards closing position. 17, is a spring resting upon a fixed support and which may be employed for normally holding the fork 15, in elevated position so as not to interfere with the free opening of the valve and so as to be ready to start it toward closing position at the appropriate part of the stroke.

From the foregoing description it is apparent that however the valve may be opened, whether automatically or mechanically, and whatever provision may be made for closing it, means are provided for  
40 quickly arresting its opening motion and starting its closing motion whereby it is closed at the appropriate part of the stroke. The mechanism which intermittently acts upon the valve when in open position does not force or hold the valve in closed position to its seat and this is obviously advantageous and as shown is accomplished by properly proportioning the throw of the return cam so as to make it less than the travel of the valve, or by making the difference in length between the returning spring and the spring which is always in  
45 operation when under their greatest compression substantially equal to the travel of the valve.

It will be obvious to those skilled in the art to which my invention appertains that modifications may be made in detail without departing from the spirit thereof, hence the invention is not limited other than the prior state of the art may require, but

Having thus described the nature and objects of my invention, what I claim as new and desire to secure by Letters Patent is:

1. The combination of the valve of an internal explosion  
5 engine, and return cam mechanism which intermittently acts upon the valve only at the beginning of its return stroke and from which the valve is free during the remainder of the stroke, substantially as described.
2. The combination with the valve of an internal explosion engine of a spring against which the valve always operates, and return mechanism including a cam movement  
10 which intermittently acts upon the valve when in open position to start its closing movement and from which the

valve is free during the remainder of its stroke, substantially as described.

3. The combination of the valve of an internal explosion engine, a spring against which the valve always operates, and mechanism including a cam movement which intermittently acts upon the valve only when in open position for starting it to close, and devices for starting the opening  
20 motion of the valve, substantially as described.

In testimony whereof I have hereunto signed my name.

HARRIS TABOR.

Witnesses:

ERNEST D. MCLFORD.

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