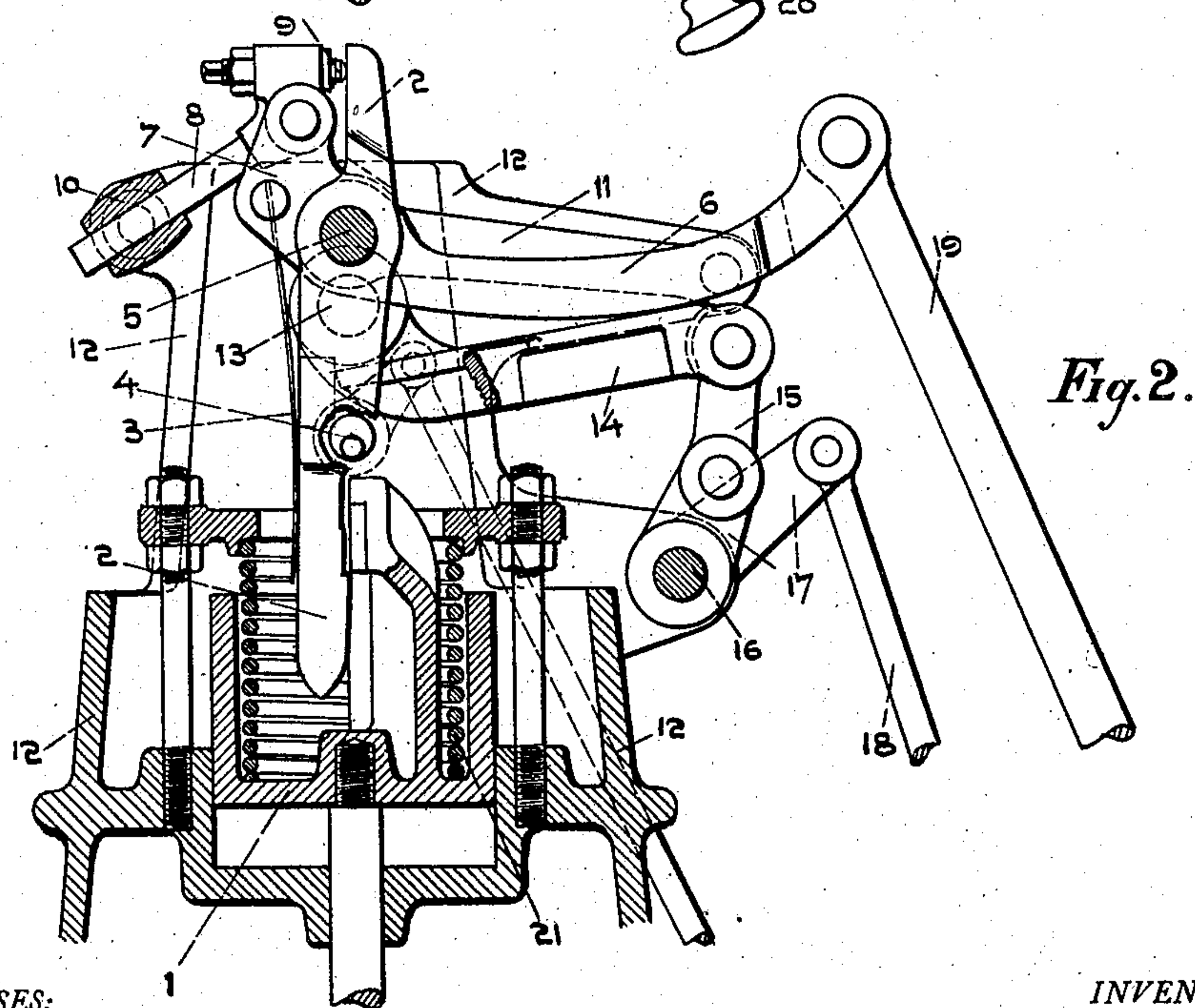
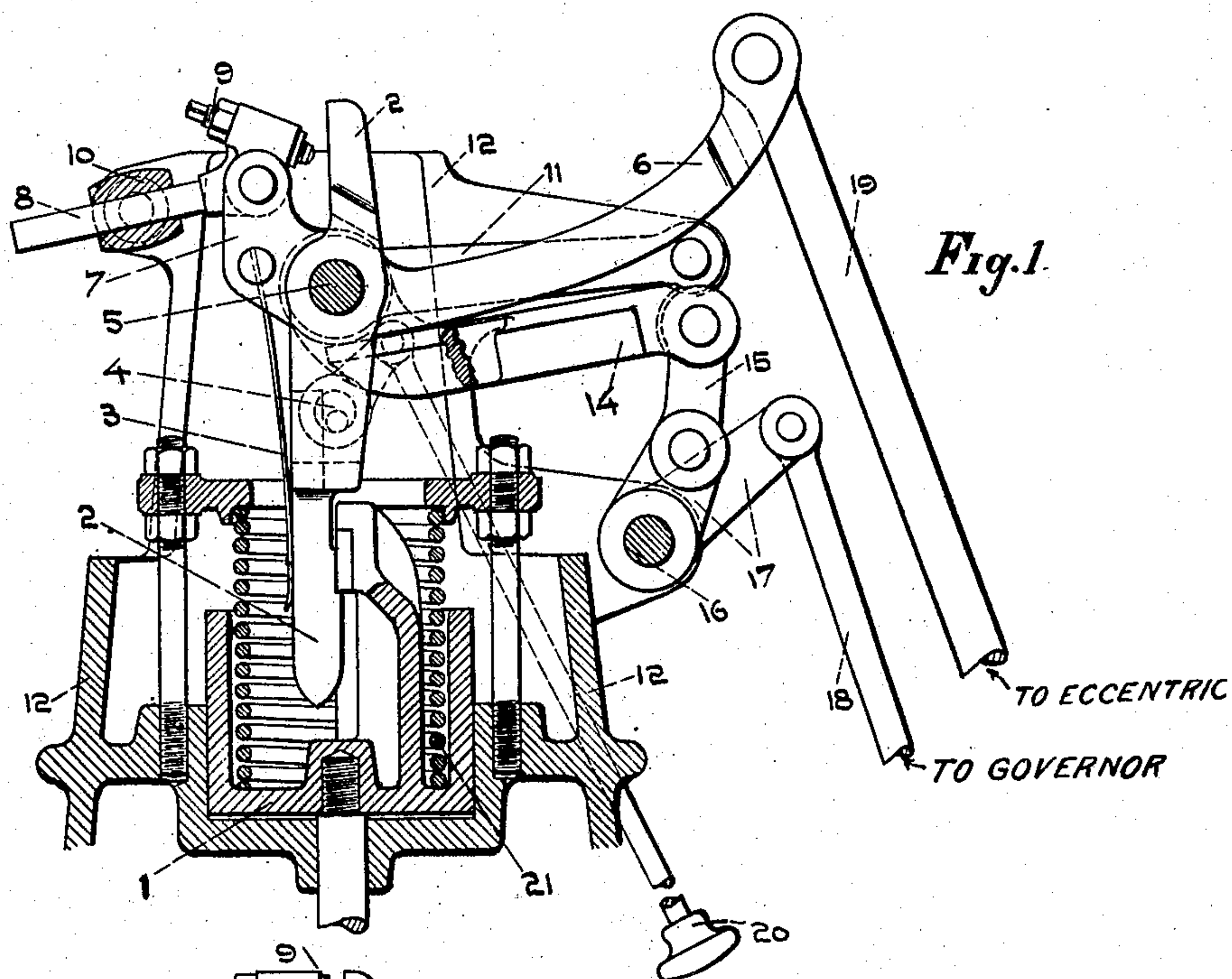


C. G. SPRADO.
TRIPPING DEVICE.
APPLICATION FILED DEC. 28, 1905.

923,592.

Patented June 1, 1909.



WITNESSES:

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TRIPPING DEVICE.

No. 923,592.

Specification of Letters Patent.

Patented June 1, 1909.

Application filed December 28, 1905. Serial No. 293,581.

To all whom it may concern:

Be it known that I, CARL G. SPRADO, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Tripping Devices, of which the following is a specification.

This invention relates to tripping devices.

This invention has utility when applied to devices which are to be variably operated in extent of motion and a variable distance commencing at a variable point. This condition is met in valve control of the admission of fluid to motors in cases where the valve is tripped at about the same point in the engine cycle.

It is found to be desirable at some times to operate valve mechanism, as for example, the admission valve mechanism of gas engines, in such a way that the valve may be opened at different times with respect to the stroke of the engine while, no matter what its time of opening may be, its time of closing shall be substantially constant with respect to the stroke of the engine.

The apparatus disclosed by the drawings accompanying this specification is a valve mechanism adapted to be operated under and in accordance with the principles of operation just stated.

Referring to the drawings,—Figure 1 shows a vertical section of an embodiment of the devices for valve control. Fig. 2 is a similar view showing the parts in a different position.

The driven member or valve 1 (the end of which only is shown) is engaged by the hook on the reciprocable element 2. The element 2 is yieldably held over so that its hook will engage with the member 1 by the spring 3. The element 2 may be thrown over by the pin 4 so that as the element reciprocates its hook will not engage the member 1. The element 2 is pivoted on the pivot-pin 5 carried by the floating link or lever 6. The lever 6 has an extension or arm 7 in which is pivotally mounted a second tripping device 8 which has the manually adjustable engaging face 9. To properly guide the member 8, it is mounted in sliding engagement within the pivoted box 10. Mounted on the pivot 5 is the link 11 having its other end mounted in the fixed frame 12. This link serves to guide the element 2 in its reciprocations. Mounted on the fixed pivot 13 carried by the frame 12 is the link 14 having a shoe or face which

engages the under side of the floating lever 6. Connected to the free end of the link 14 is the link 15. Mounted on the pivot pin 16 carried by the frame 12 is the bell crank lever 17 engaging the link 15 with one of its arms, its other arm being connected to the link 18 which leads to the governor or some speed regulating device. The floating lever 6 has the link 19 connected thereto which may be regularly reciprocated, as by an eccentric. The trip 4 may be manually operated by the handle 20. The spring 21 normally forces the driven member or dash pot piston of the valve 1 against its seat in the frame 12.

In operation, with the rod 19 at its upward limit of movement, the parts will be in the position shown in Fig. 1, with the pivoted reciprocable element 2 in engagement with the member 1. As the rod 19 moves downward it carries the floating lever 6, and through the pivot 5, lifts the element 2 so that the member 1 is moved against the resistance of the spring 21. By this continued movement, the elements are brought into the position shown in Fig. 2. The pin 9 of the element 8 is shown in the position of tripping the element 2, thereby permitting the member 1 to be forced down by the spring 21.

In regular operation of the rod 19, the time of beginning of lift of the member 1 may be varied by the action of the regulator through the floating link or lever 6 which rests upon the shoe of the regulator actuated link 14, which link 14 serves as a movable fulcrum for lever 6 in raising the element 2. However, this variation of the fulcrum of lever 6, while changing the time of beginning of lift of member 1, that is when the hook of element 2 begins to engage, practically does not affect the time of trip owing to the particular form of the tripping device 8 and the manner in which this tripping device is mounted. The opening of the valve occurs at a variable point of the inlet stroke because of the variable position of the link 14 as determined by the governor. The closing of the valve occurs at substantially a constant point of the inlet stroke because of the compensation afforded by the backing away from element 2 of the engaging face 9 of the tripping means 8 by its being caused by box 10 to swing about its pivotal mounting on lever 6; such compensation being on account of the sooner approach, during operation, of such pivotal mounting to the upper end of element 2

when the link 14 has a high position given it by the governor.

If, while the machine is running regularly, it is desired to discontinue the movements of the member 1, this may readily be accomplished through the handle 20 by throwing the pin 4 over to hold the element 2 so that its hook cannot engage the member 1, by which means one end of a cylinder of the engine may be cut out of action, should such become necessary either as the result of accident or of decrease of the load upon the engine.

What is claimed and it is desired to secure by Letters Patent is:

1. The combination with a valve of means for moving said valve in one direction, a reciprocable element provided with a hook adapted to engage with said valve for moving said valve in the opposite direction, a floating lever secured to said reciprocable element, a pivoted movable link supporting said floating lever, means for operating said floating lever, and means carried by said floating lever and in engagement with a fixed part and adapted to engage with said reciprocable element to disengage said reciprocable element from said valve.

2. The combination with a valve of a frame in which said valve is mounted and with respect to which said valve is adapted to be reciprocated, a spring for moving said valve in one direction, a reciprocable element provided with a hook adapted to engage with said valve for moving it in the opposite direction, a floating lever to which said reciprocable element is pivotally united, a movable link pivoted to the casing and supporting said floating lever, means to rock said floating lever upon said link, a spring engaged with said reciprocable element and said floating lever to retain the hook of said reciprocable element in engagement with said valve, and means carried by said floating lever and adapted to engage with said reciprocable element to release said reciprocable element from said valve.

3. The combination with a valve of a frame in which said valve is mounted and with respect to which said valve is adapted to be reciprocated, a spring for reciprocating said valve in one direction, a reciprocable

element provided with a hook adapted to engage with said valve for moving it in the opposite direction, a floating lever to which said reciprocable element is pivotally united, a movable link pivoted to the casing and supporting said floating lever, means to rock said floating lever upon said link, a spring engaged with said reciprocable element and said floating lever to retain the hook of said reciprocable element in engagement with said valve, and means pivoted to said floating lever and pivotally and slidably engaged with said casing to release said reciprocable element from said valve.

4. The combination with a valve of a frame in which said valve is mounted and with respect to which said valve is adapted to be reciprocated, a spring for reciprocating said valve in one direction, a reciprocable element provided with a hook adapted to engage with said valve for moving it in the opposite direction, a floating lever to which said reciprocable element is pivotally united, a movable link pivoted to the casing and supporting said floating lever, means to rock said floating lever upon said link, a spring engaged with said reciprocable element and said floating lever to retain the hook of said reciprocable element in engagement with said valve, means pivoted to said floating lever and pivotally and slidably engaged with said casing to release said reciprocable element from said valve, and means to swing said reciprocable element about its pivot to prevent its engaging with said valve.

5. The combination with a valve of means for moving said valve in one direction, a movable element engageable with said valve for moving same in the opposite direction, a floating lever secured to said movable element, an adjustable link supporting said floating lever, means for operating said floating lever, and means carried by said floating lever and movable thereon and adapted to engage with said movable element to disengage same from said valve.

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

CARL G. SPRADO.

Witnesses;

JOHN DAY, Jr.,
GEO. E. KIRK.