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W. E. W. NICOLLS

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GOVERNOR FOR LIQUID FUEL INJECTION PUMPS

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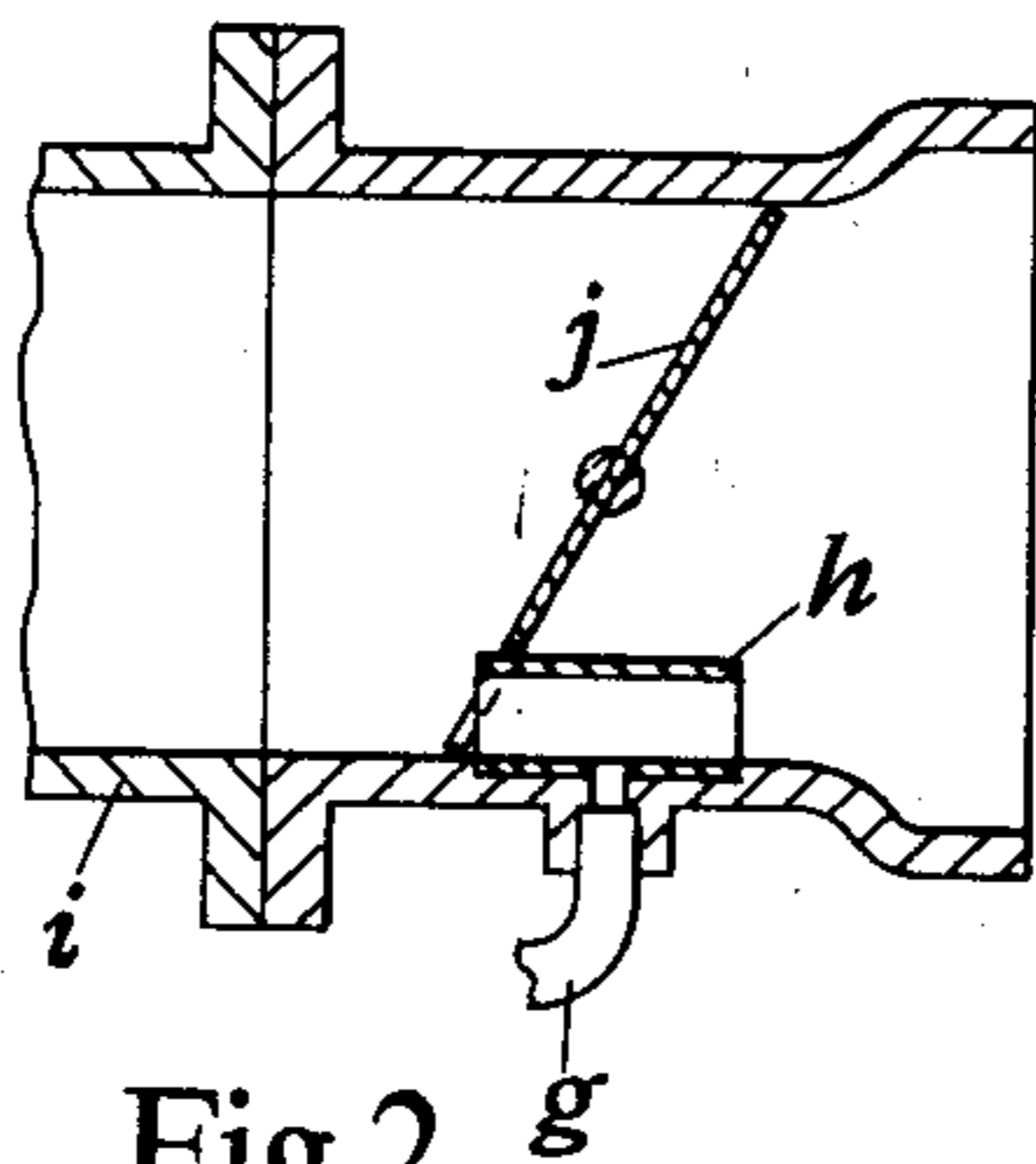


Fig. 2

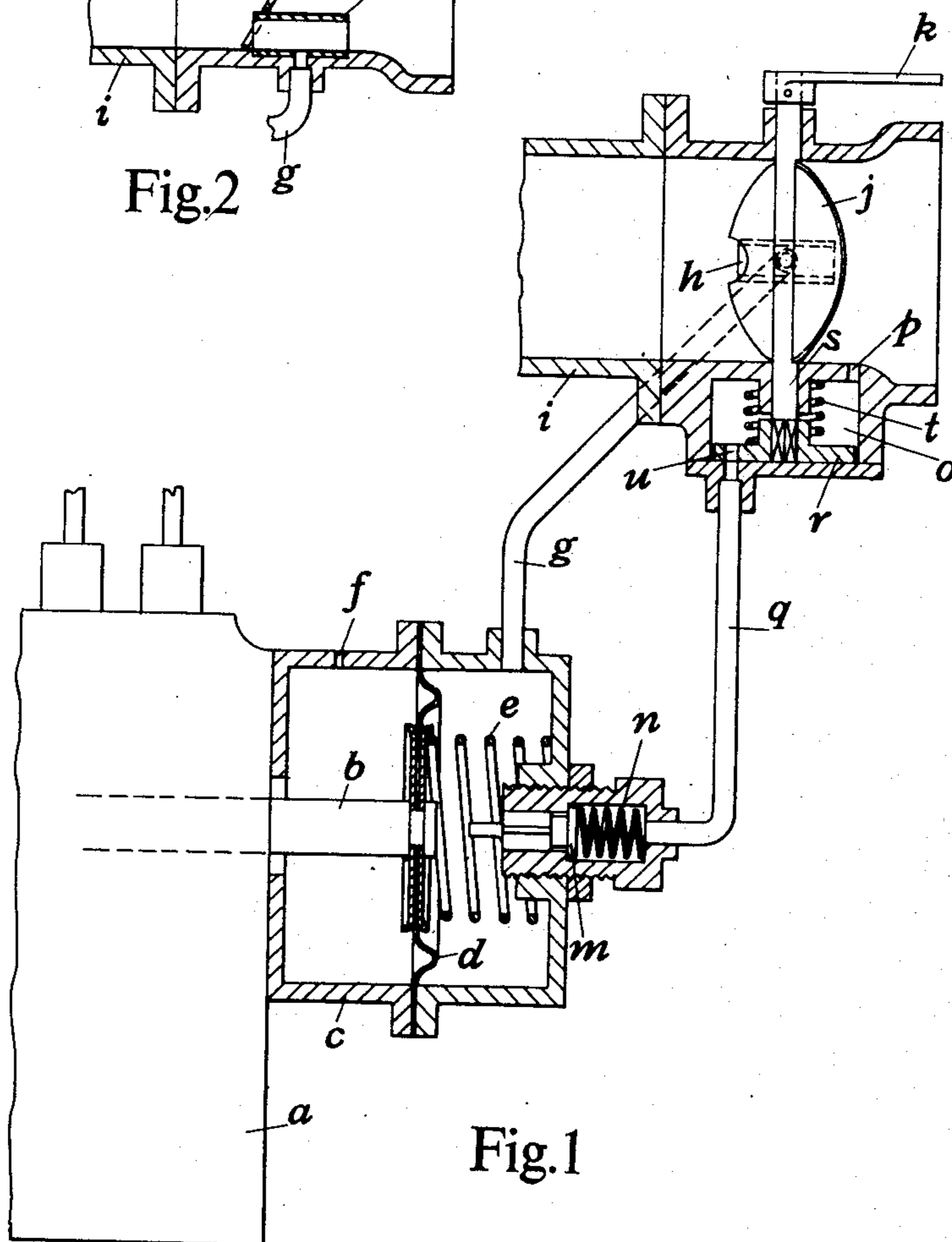


Fig. 1

Inventor
W. E. W. Nicolls
By Lawrence Downing Beeble
Atty.

UNITED STATES PATENT OFFICE

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GOVERNOR FOR LIQUID FUEL INJECTION PUMPS

Wilfrid Edward Walter Nicolls, Pinner, England,
 assignor to C. A. V. Limited, London, England

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2 Claims. (Cl. 123—140)

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This invention relates to a governor for a pump of the reciprocatory plunger type used for injecting liquid fuel into an internal combustion engine, the pump having combined with it a slidable rack or other bar movable by the governor for varying the pump output. The governor to which the present invention relates is of the kind which is responsive to suction in the air-manifold of the engine, and which has combined with it a stabilising air-admission valve which (when the throttle in the air-manifold is closed) can be opened by a movable part of the governor when the said slidable bar of the pump is in the position of minimum fuel supply.

It has been found desirable in some conditions to provide means for rendering the said stabilising valve inoperative when the engine is working at other than idling speed with the throttle open, and the object of the present invention is to enable this requirement to be met in a simple and convenient manner.

The invention comprises a means operable in conjunction with the air-manifold throttle of the engine for isolating the stabilising valve of the governor.

In the accompanying drawings:

Figure 1 is a sectional side elevation illustrating diagrammatically a pump governor provided with the invention.

Figure 2 is a sectional plan of the throttle in the air-manifold.

In the known form of governing means shown in the drawings, there is mounted on the pump body *a* adjacent to the end of the slidable control bar *b*, a chamber *c* which is divided into two compartments by a flexible diaphragm *d* (or piston) to which the adjacent end of the bar is secured, the diaphragm (or piston) being loaded by a spring *e*. One of the said compartments is open to the atmosphere through an orifice *f*, and the other is connected by a pipe *g* to a short Venturi tube *h* or passage located in the air manifold *i* of the engine at a position immediately adjacent to the throttle *j* (which latter is of the butterfly type), the throttle being manually operable by a lever *k*. In one end of the compartment connected to the manifold, is mounted an air admission (or stabilising) valve *m* which is lightly loaded by a spring *n* and which, when the bar is moved by the manifold suction action against the spring *e* to the position of minimum fuel supply, with the throttle closed and the engine idling, is opened (by contact with the diaphragm) for the admission of

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air at atmospheric pressure to the said compartment for stabilising the action of the governor.

In applying the present invention to the arrangement above described in the manner shown in Figure 1, there is formed on or secured to the manifold *i* adjacent to the throttle *j*, a small chamber *o* which is open (through an orifice *p*) to the entrance side of the throttle, this chamber being connected by a pipe *q* to the stabilising air valve *m*.

In the said chamber *o* is provided a closure member *r* in the form of a disc which is attached to the throttle trunnion *s* and which is held in contact with a seating in the chamber by a spring *t*. In the said member is formed a port *u* whereby (in one position of the said member) the stabilising valve can receive air at atmospheric pressure.

The arrangement is such that when the throttle is closed, the closure member *r* is in the position at which air can pass to the stabilising valve *m*, so that when the engine is idling the stabilising valve can operate in the normal manner. But when the throttle is opened, and the engine is running at an intermediate or full speed, the said closure member *r* is moved by the throttle into a position in which it closes the communication with the stabilising valve, so isolating the latter and rendering it inoperative.

The invention is not, however, restricted to the example above described, as the isolating valve may be arranged in any other convenient manner in which it is operable in conjunction with the throttle.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. A governor for a reciprocating plunger pump for injecting liquid fuel into an internal combustion engine having an air manifold controlled by a throttle comprising in combination with a movable element of the pump for varying the pump output, a pressure responsive member for actuating said movable element in response to the suction in the engine air manifold, a normally closed valve for admitting air to said pressure responsive member and adapted to be opened by a movable part of the governor when said movable element is in a position corresponding to minimum fuel supply, and means actuated in conjunction with the air manifold throttle for isolating said valve to prevent operation thereof when the engine is working at other than idling speed.

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2. A governor for a reciprocating plunger pump for injecting liquid fuel into an internal combustion engine having an air manifold controlled by a throttle comprising, in combination with a movable element of the pump for varying the pump output, a pressure responsive member for actuating said movable element in response to the suction in the engine air manifold, a normally closed valve for admitting air to said pressure responsive member and adapted to be opened by a movable part of the governor when said movable element is in a position corresponding to minimum fuel supply, a chamber on the air manifold having communication therewith on the air entry side of the throttle, a communicating passage between the said chamber and the said normally closed valve whereby air can be admitted to the pressure responsive member when said valve is open, a rotary closure mem-

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ber in the said chamber for controlling the communicating passage, and an operative connection between the throttle and the rotary closure member whereby the latter is closed to isolate the aforesaid normally closed valve and prevent operation thereof when the throttle occupies a position in which the engine is working at other than idling speed.

WILFRID EDWARD WALTER NICOLLS.

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