

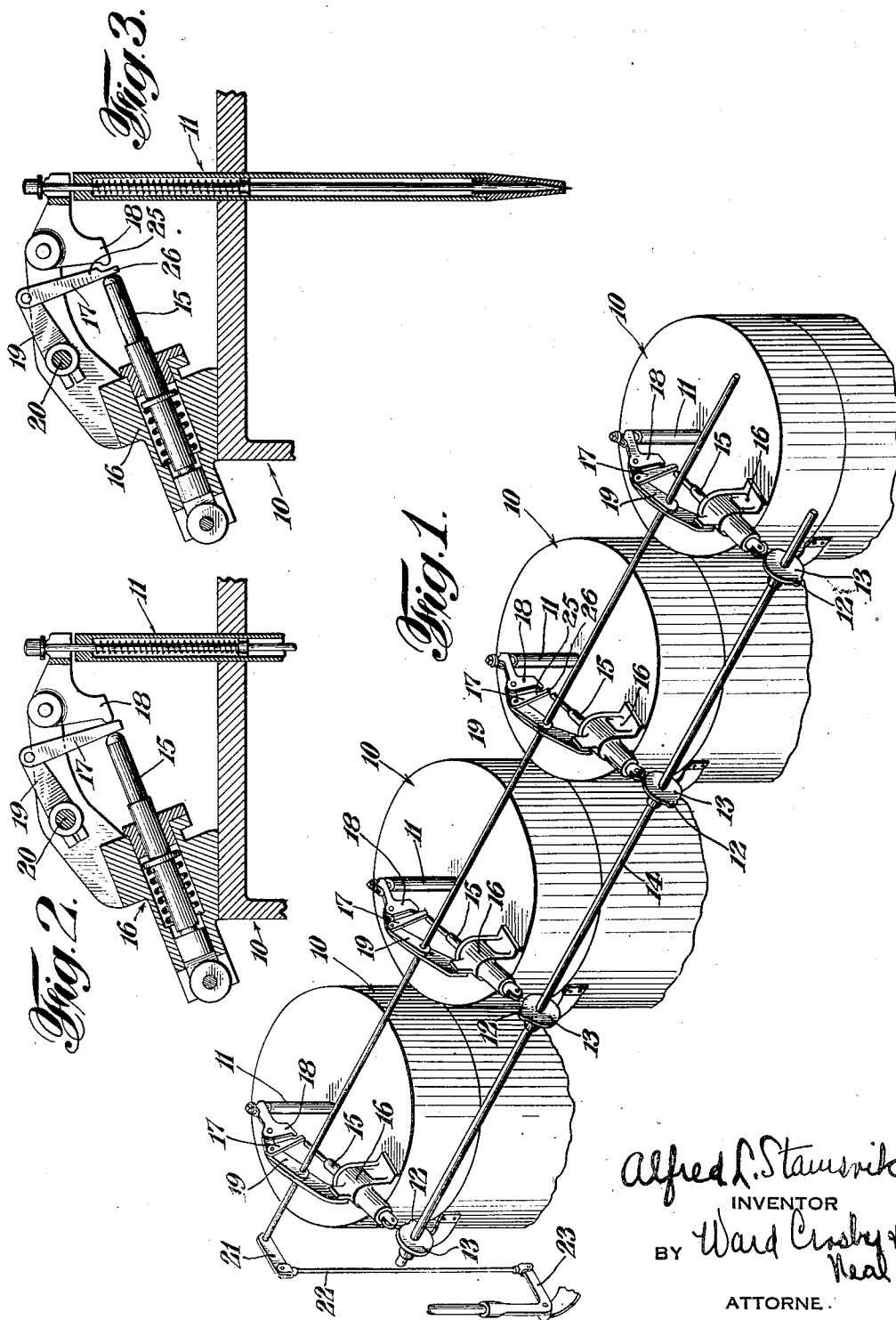
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FUEL CONTROLLING MECHANISM FOR INTERNAL COMBUSTION ENGINES

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FUEL CONTROLLING MECHANISM FOR INTERNAL COMBUSTION ENGINES

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The invention relates to a fuel controlling mechanism for internal combustion engines, more particularly of the Diesel type, in which it is common practice to employ a fuel controlling mechanism automatically adjusted to maintain a desired speed under different loads. In operation it is found that under light loads, the supply of fuel becomes so small that it is difficult to obtain even firing of the various cylinders and thus the governing of the engine becomes erratic at light loads.

The primary object of the present invention is to provide a fuel controlling mechanism which will avoid the above objections by automatically cutting off the fuel supply to certain of the cylinders, at low loads, or low speed, thereby permitting the remaining cylinders to obtain a supply of fuel which will be adequate to insure even firing, and nevertheless carry the light load at the desired speed.

This invention is described in connection with the accompanying drawing in which—

Fig. 1 shows in outline part of an engine to which the valve control mechanism is applied;

Fig. 2 shows a fuel control wedge and its cooperation with the needle valve rocker arm, and

Fig. 3 shows the invention applied to the fuel control wedge.

The invention as illustrated is applied to a fuel controlling mechanism which in respect to many of its features, is of well known type employed for Diesel engines, and therefore such features as the fluid supply system, the fluid pressure and by-passing mechanisms, governor and throttle control for the governor, are not shown or described in detail herein.

In engines of this type, there are any number of cylinders 10, usually four, six or eight. The needle valve 11 of each cylinder controls the amount of fuel injected into that cylinder. The valves are raised by cooperation of the high points 12 of cams 13 on a cam shaft 14 driven in timed relation with the engine crank shaft. Movement from the cams 13 is transmitted to the needle valves through one way spring-pressed plungers 15 extending

through and slidable in the usual bearing bracket 16 supported on the end of the cylinder, and bearing against fuel control wedges 17 interposed between the plungers and rocker arms 18 also suitably supported on the cylinders on extensions on the brackets 16 as shown or on separate brackets, and having the usual connection with the needle valves 11. The mechanism as is well understood lifts the valve 11 at the proper time during cycles of the engine.

The fuel control wedges 17 by their position regulate the amount of lift given to the needle valves 11. For this purpose they are pivotally supported on arms 19 secured to a shaft 20 supported in said extensions on the brackets 16 and controlled by the governor (not shown) through an arm 21 on the shaft, a link rod 22 connecting the arm and a bell crank 23 operated by the governor.

As the speed of the engine decreases under load the shaft 20 is rocked clockwise and the wedges 17 are lowered to cause the plungers 15 to transmit more movement to the rocker arms 18 and consequently to lift the needle valves 11 higher to increase the fuel supply to the cylinders.

In accordance with the present invention the fuel controlling mechanism is so constructed that under relatively high loads and/or speeds, the amount of fuel fed to the several cylinders is correspondingly regulated and distributed, but when the load and/or speed drop down to a given low point, the fuel supply is automatically cut off to certain of the cylinders. For example, the fuel control wedges associated with the needle valves 11 of the second and fourth order firing cylinders of a four cylinder engine may be away as at 25, Figs. 1 and 3, so that the portion 26 of the wedges 17 will not transfer any motion from the plungers 15 to the rocker arms 18 and needle valves 11 of these cylinders with the result that no fuel is admitted to these cylinders. The point at which this recess is located is determined by the position of the wedges in which their control is uneven. That is, certain of the wedges are cut away at a point where the other wedges will

still admit enough fuel to their cylinders to cause an even firing of these cylinders.

In an engine equipped with this invention, the engine may be throttled down to a low speed or operated at low load in the usual manner and when the speed or load approaches the point beyond which the firing becomes uneven, the fuel supply to certain of the cylinders is cut off automatically and the engine in turn fires evenly on all of the remaining cylinders to which fuel is admitted.

While certain specific embodiments of the invention have been described it will be obvious that many changes may be made therein without departing from its principles as defined in the appended claims.

I claim:

1. In a multiple cylinder engine of the class described, a fuel supply valve for each cylinder, an actuating member for each valve, an adjustable fuel controlling mechanism having movable cam members associated with the respective valve actuating members, to regulate the amount of opening of the respective valves, certain of said cam members being constructed to maintain substantially equal fuel distribution between the corresponding cylinders throughout adjustments of said mechanism, and others of said cam members being constructed to maintain similar fuel distribution during adjustments of said mechanism wherein relatively large amounts of fuel are supplied, and to cause the fuel supply to be cut off from said last mentioned cylinders during other adjustments of said mechanism.

2. In a multiple cylinder engine of the class described, a fuel supply valve for each cylinder, an actuating member for each valve, an adjustable fuel controlling mechanism having members cooperating with certain of said actuating members to operatively connect the same to the corresponding valves throughout the operating range in adjustment of said mechanism, said mechanism also having members cooperating with others of said actuating members to render the latter inoperative with respect to the corresponding valves during adjustment wherein relatively small amounts of fuel are supplied to the engine.

In testimony whereof I have signed my name to this specification.

ALFRED L. STAMSVIK.

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