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EXPLOSION ENGINE

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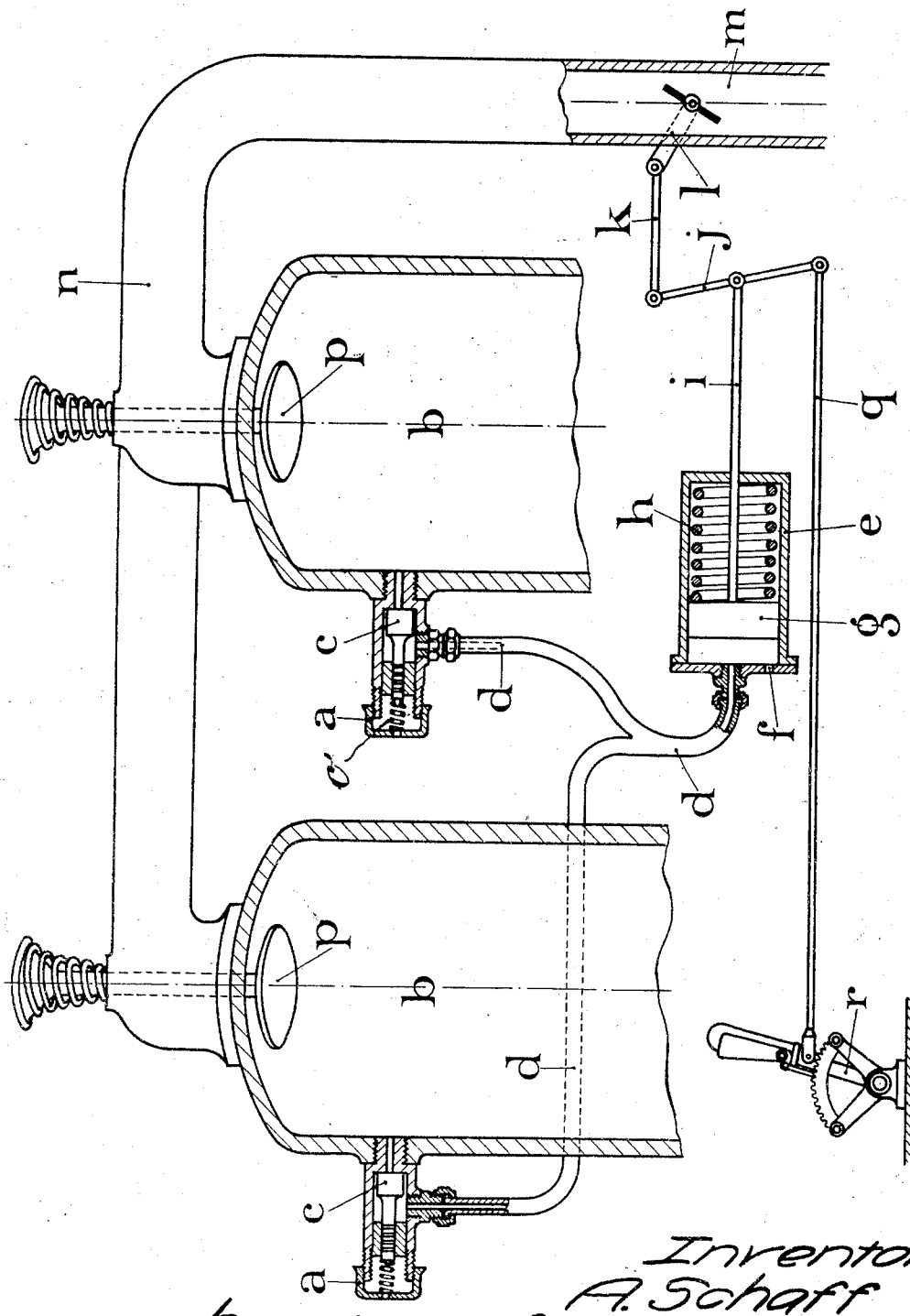

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EXPLOSION ENGINE.

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This invention relates to means for restricting automatically the supply of fuel in internal combustion engines, more particularly those of aircraft. Some aircraft engines are either designed and constructed for normal running above a certain altitude, or are provided, for the same purpose, with special accessories such as supercharging compressors, but they cannot, without inconvenience, be run under full admission, or with the full supercharge of the compressor, at altitudes lower than the normal running altitudes; and they are, therefore, fitted with means for automatically restricting the supply of fuel, in order to avoid excessive strain on their members when the engines are running at such lower altitudes.

For effecting the automatic restriction of the maximum admission, most of the appliances constructed for this purpose employ an apparatus which is sensitive to variations in atmospheric pressure, but these only produce variations in energy which are relatively slight and, in certain cases, are incapable of overcoming the passive resistance of the devices controlling the admission to the engine.

The present invention has for its object to enable much greater variations in energy to be accomplished, for which purpose the maximum admission into the cylinders is regulated by the maximum pressure prevailing therein, so that said pressure cannot exceed a certain value, whatever be the conditions under which the engine is running.

The accompanying drawing illustrates, diagrammatically and by way of example, a device for carrying out the invention shown in plan view and partly in section.

For carrying out the invention, use is made of apparatus of known type arranged in such a way as to be subjected to the maximum pressure produced in an internal combustion engine running under normal conditions. These known apparatus consist of small chests a, each of which is in communication with the compression chamber of a cylinder b by means of a valve c, or similar member, opening outwardly of the cylinder b, against the pressure of a spring c^1.

Tubes d connect the chests a with one another and with a cylindrical chamber e formed with an orifice f opening into the atmosphere, said chamber e having slidable therein a piston g balanced by a spring h, of such a kind that the maximum movements the piston is intended to describe will have no notable effect on its tension. The rod i of the piston g is connected with the admission members (not shown) of the cylinders by any suitable mechanism. The piston g may, of course, be replaced by any other member adapted to move under the action of the pressure.

After a short running time, the pressure in the chests a assumes a constant value dependent of the maximum pressure set up, at each cycle, in the cylinders b, since the valves c allow the gases under pressure to enter the chests a, but prevent their return to the cylinders b. Owing to the communication between these chests and the cylindrical chamber e, the pressure in the latter, after a short running time, will also assume a value dependent on the maximum pressure in the cylinders b. The very small orifice f, through which the gases escape to the outside, enables a balance to be attained between the pressures in the chamber e and chests a and the maximum pressure in the cylinders b, in the event of a drop in the normal working pressure in the latter. The movements of the piston g regulate the admission to the engine cylinders b.

For this purpose, the stem i of piston g is connected, by means of a rock lever j and a link k, with a lever l attached to a valve m placed in the conduit n leading from the carburetter (not shown) to the admission valves p of the cylinders. The lever j is also connected by a lever q to the hand lever r which is of any well known type adapted to be operated by the driver.

When the stem i moves to the right under the effect of the maximum pressure in the cylinders b causing a certain pressure to prevail in the cylinder e, the valve m can no longer be moved, by means of the hand lever r, to a position parallel to the axis of conduit n, and therefore the maximum admission of the combustible mixture through conduit n to the valves of the cylinders b is reduced. The reverse occurs when the stem i of the piston g moves to the left. The control of the maximum admission by the pressure in the cylinder e is thus obtained.

The above connections were only given by way of illustration and may be modified if the control device formed by the chests a and the cylinder e is employed with any

other system of admission to the engine cylinders. The device is of course applicable to any number of cylinders.

What is claimed is:

1. In a multi-cylinder internal combustion engine, an intake manifold, a throttle valve therein and a control member for said throttle valve responsive to the maximum pressure in said cylinders, including a cylinder, a piston therein operatively connected to said throttle valve, a constant tension spring on one side of said piston biasing the latter in the direction to open said throttle valve, the other side of said piston being biased in the opposite direction by the maximum cylinder pressure.

2. In a multi-cylinder internal combustion engine, an intake manifold, a throttle valve therein and a control member for said throttle valve responsive to the maximum pressure in said cylinders, including a cylinder, a piston therein operatively connected to said throttle valve, means exerting constant pressure on one side of the piston biasing it in a direction to open said throttle valve, the other side of said piston being biased in the opposite direction by the maximum cylinder pressure.

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

ALBERT SCHAFF.