No. 794,192. PATENTED JULY 11, 1905.

J. W. SEAL.

INTERNAL COMBUSTION ENGINE.

APPLICATION FILED OCT. 23, 1903.

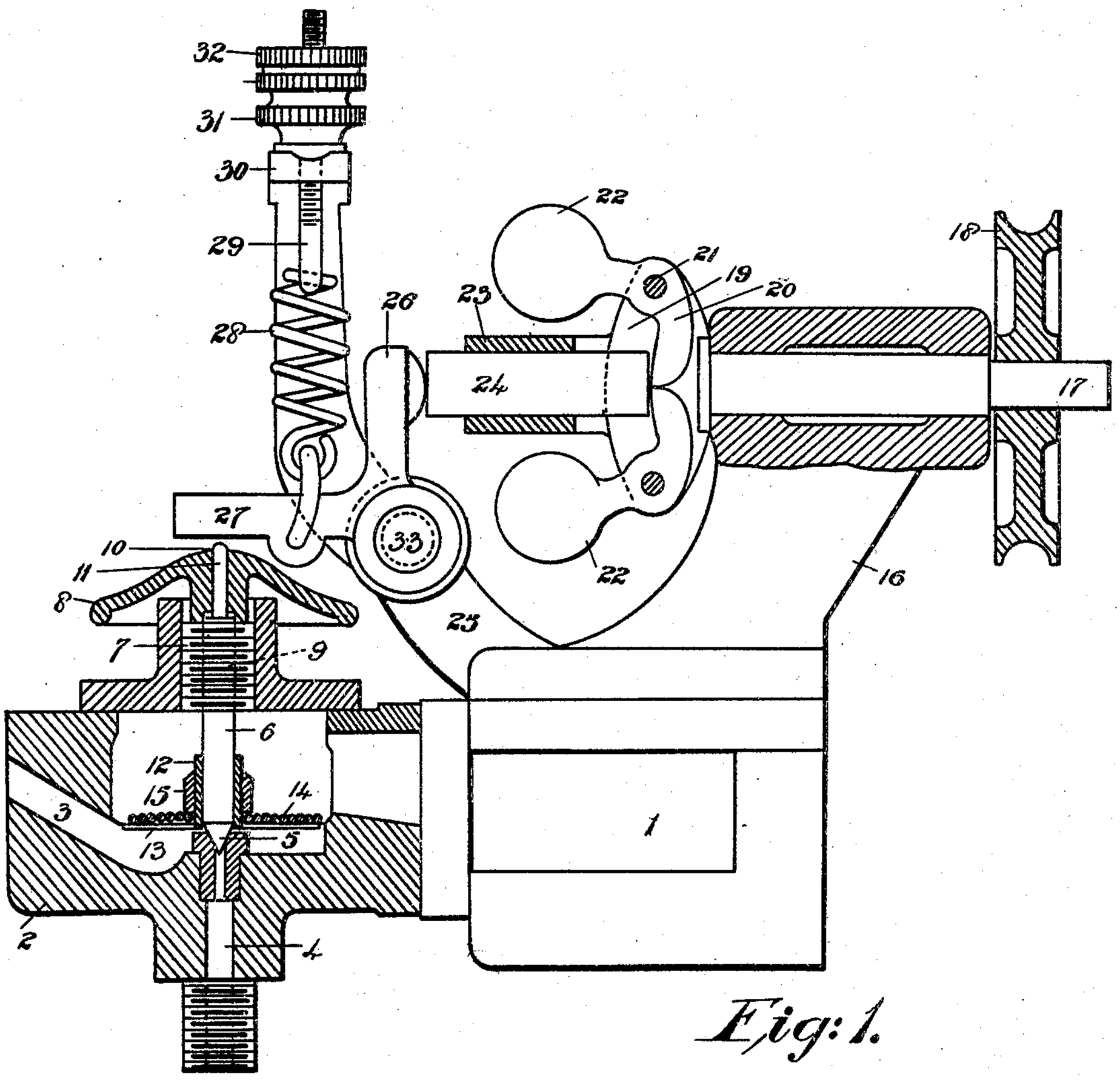

Fig: 1.

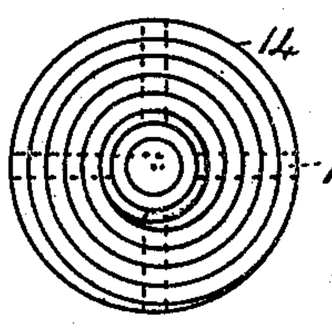

Fig: 2.

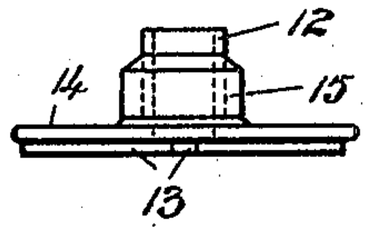

Fig: 3.

Witnesses
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UNITED STATES PATENT OFFICE.

JOHN WILLIAM SEAL, OF HAMMERSMITH, LONDON, ENGLAND, ASSIGNOR OF TWO-THIRDS TO JOHN BERNARD LANGFORD, OF CHISWICK, ENGLAND.

INTERNAL-COMBUSTION ENGINE.

SPECIFICATION forming part of Letters Patent No. 794,192, dated July 11, 1905.

Application filed October 23, 1903. Serial No. 178,298.

To all whom it may concern:

Be it known that I, JOHN WILLIAM SEAL, a subject of the King of Great Britain, residing at Oil Mill Lane, Hammersmith, London, England, have invented new and useful Improvements in Internal-Combustion Engines, of which the following is a specification.

This invention has for its object a mixing-valve and means for operating or controlling same applicable to internal-combustion engines.

The invention is shown in the accompanying drawings, in which—

Figure 1 is a sectional elevation of the mixing-chamber with the valve and a mechanical governing arrangement applied thereto. Fig. 2 is a plan and Fig. 3 an edge view of the essential part of the mixing-valve.

The device is placed in connection in the usual manner with the inlet-valve of an explosion-engine. 1 may be the vaporizer of such an engine, with which the casing 2 of the mixing-valve connects.

3 is the passage by which air enters the casing 2; 4, the duct connected to a supply of liquid fuel, such as oil; 5, a seating in said duct; 6, the stem of the needle-valve, the end of which fits in said seating to control the feed of the oil or the like, and 7 a screw with an adjusting-head 8 and with a central bore 9 to receive the stem 6. The stem 6 is prolonged by a narrow portion 10, which passes through a hole 11 in the head 8. Upon the stem 6 is fixed a sleeve 12, formed with or carrying a cruciform support 13, upon which latter rests the helix of wire or other springy material 14, forming the flexible valve. This helix is held in place by a sleeve or collar 15, fitting on the sleeve 12.

In operation in the case of an oil-engine the stem 6 of the oil-valve is raised to allow oil to pass, owing to the inrush of air through the channel 3 and past the helix 14 on the suction stroke of the piston, the oil which enters through the seating 5 being carried forward with the air to the vaporizer 1, and so to the inlet of the engine in the usual manner. The lift allowed to the stem 6 is regulated by screwing inward or outward the head 8, thereby leaving more or less space for the stem to rise in the boring 9. The helix 14, owing to the fact that it is only held at the center and is otherwise free to rise upward from the support 13, allows the full volume of air to be drawn in at each suction stroke of the engine quite independently of the opening allowed to the oil-inlet valve, while, however, the advantage is retained that the oil-valve is automatically operated by the incoming air.

When the feed of oil is to be controlled automatically, the arrangement shown in Fig 1 is adopted. In this arrangement a support 16 carries a shaft 17, having fixed thereon at one end a pulley 18, driven by a belt from any convenient part of the engine, while at the other end the shaft has an enlarged part 19, slotted to receive the arms 20 of angle-pieces pivoted on studs 21 and carrying at their outer ends governor-balls 22. Beyond the part 19 is a sleeve 23, in which is free to move longitudinally a short shaft 24. On a support 25 is pivoted, by pin 33, a bell-crank lever 26 27, the arm 26 of which is adapted to be moved by the end of shaft 24, while the other arm is arranged to bear upon the top or prolongation 10 of valve-stem 6 and is pulled upward by a spring 28. This spring is hung from a screw-rod 29, passing through a lug 30 at the top of support 25 and adapted to be raised or lowered and locked by the nuts 31 32. With this arrangement the speed of rotation of shaft 17 varies with the speed of the engine, and if this latter becomes excessive the balls 22 fly outward, their arms 20 move forward, pressing outward the shaft 24, and this in turn turns the bell-crank lever 26 27 against the tension of spring 28, and the arm 27 being lowered limits the upward movement of the stem 6, so reducing the feed of oil until the speed of the engine again falls and the normal state of affairs is reached.

What I claim is—

1. In a mixing-valve for internal-combustion engines the combination with a casing, an air-inlet, a fuel-inlet and an exit for the mixture, of a valve adapted to control the admission of the fuel, and a flexible disk con-

sisting of a helix of springy material, and a support therefor, said disk being fixed on the stem of said valve and arranged in such manner that the air passing through the casing must impinge against it and tend to open the fuel-inlet valve.

2. A mixing-valve for internal-combustion engines comprising a casing, a passage for the admission of air, a passage for the admission of fuel, an exit for the mixture, a valve for controlling the inlet of the fuel, a flexible disk formed from a helix of springy material connected at its center part only to the fuel-inlet valve and standing in the passage for air, and means for limiting the movement of the fuel-inlet valve.

3. A mixing-valve for internal-combustion engines comprising a casing, a passage for the admission of air, a passage for the admission of the fuel, an exit for the mixture, a valve for controlling the inlet of the fuel, a flexible disk formed from a helix of springy material connected at its center part only to the fuel-inlet valve and standing in the passage for air, a screw, means for adjusting said screw, and a bore therein adapted to receive the stem of the fuel-inlet valve.

4. The combination of a mixing-valve for internal-combustion engines comprising a casing, a passage for the admission of air, a passage for the admission of the fuel, an exit for the mixture, a valve for controlling the inlet of the fuel, and a flexible disk connected to the fuel-inlet valve and standing in the passage for air, with a governor adapted to be driven by suitable means from the engine to which the device is to be applied, and a lever adapted to be moved by said governor and to limit to a less or greater extent the movement of the fuel-inlet valve.

5. The combination of a mixing-valve for internal-combustion engines comprising a casing, a passage for the admission of air, a passage for the admission of the fuel, an exit for the mixture, a valve for controlling the inlet of the fuel, and a flexible disk formed from a helix of springy material connected to the fuel-inlet valve and standing in the passage for air, with a governor adapted to be driven by suitable means from the engine to which the device is to be applied, and a lever adapted to be moved by said governor and to limit to a less or greater extent the movement of the fuel-inlet valve.

6. The combination of a mixing-valve for internal-combustion engines comprising a casing, a passage for the admission of air, a passage for the admission of the fuel, an exit for the mixture, a valve for controlling the inlet of the fuel and a flexible disk connected to the fuel-inlet valve and standing in the passage for air, with a governor adapted to be driven by suitable means from the engine to which the device is to be applied, a lever adapted to be moved by said governor and to limit to a less or greater extent the movement of the fuel-inlet valve, and independent means for limiting the movement of the fuel-inlet valve.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN WILLIAM SEAL.

Witnesses:

GEO. GOUDIE,

C. H. RICHARDS.