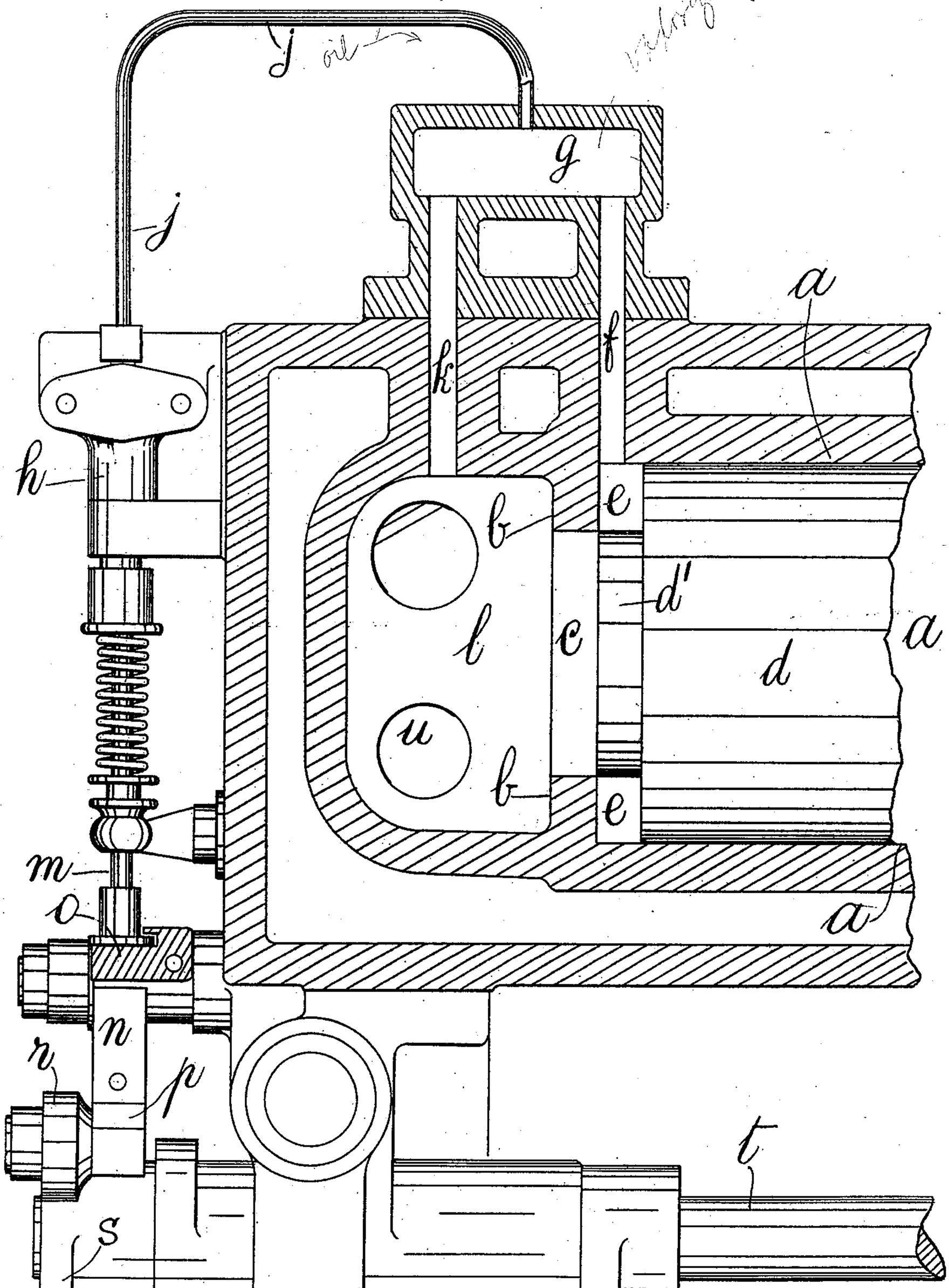
No. 640,083. Patented Dec. 26, 1899.

H. N. BICKERTON & H. W. BRADLEY.

OIL ENGINE.

(Application filed Sept. 29, 1899.)

(No Model.)



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UNITED STATES PATENT OFFICE.

HENRY NIELD BICKERTON AND HENRY WENTWORTH BRADLEY, OF ASHTON-UNDER-LYNE, ENGLAND.

OIL-ENGINE.

SPECIFICATION forming part of Letters Patent No. 640,083, dated December 26, 1899.

Application filed September 29, 1899. Serial No. 732,064. (No model.)

To all whom it may concern:

Be it known that we, HENRY NIELD BICKERTON and HENRY WENTWORTH BRADLEY, subjects of the Queen of Great Britain, residing at Ashton-under-Lyne, in the county of Lancaster, England, have invented a new and useful Improvement in Oil-Engines, (for which we have obtained provisional protection in Great Britain, No. 8,595, bearing date April 25, 1899,) of which the following is a specification.

The improvements relate to oil-engines, and have for their object the injection of oil and firing the same in the form of vapor or gas by compressed air or gases at the proper times for combustion or explosion in the cylinder or explosion-chamber of the engine in the manner hereinafter to be described; and in order that the invention may be the better understood we will proceed to describe the same with reference to the accompanying sheet of drawings, wherein the figure represents a sectional plan of part of the back end of an oil-engine provided and arranged in accordance with our improvements.

In carrying out the present invention we prefer to form the main cylinder *a* of the engine with an internal partition *b*, having an aperture *c* therein, into which fits a projection *d'*, formed upon the end of the piston *d*, which is thus capable of inclosing an air-space *e* between the partition *b* and the main body of the piston *d* when the projection *d'* passes into the recess *c*, as shown in the drawing. Communicating with the inclosed air-space *e* thus formed when the piston is approaching the end of its stroke is a tube or opening *f* in connection with a vaporizing outer or isolated chamber *g*, which latter is in communication with an oil-pump *h* by means of a tube *j*, and such outer or isolated chamber *g* also communicates through a passage *k* with the explosion-chamber or back end of the cylinder *l*. The outer or isolated chamber *g* is kept sufficiently hot to vaporize the oil by means of the heated gases having access thereto; but in starting the engine such chamber may be heated by any external means.

The oil-pump *h* is operated to permit the proper quantity of oil to enter the vaporizer *g* at the right moment, a plunger *m*, connected with the pump, being actuated for this purpose by the movement of a pusher *n* through the interposed block *o*. The pusher *n* is mounted at the end of a fulcrumed lever *p*, which carries a bowl *r*, acted on by a cam *s* at every revolution of the side shaft *t*.

The operation is as follows: In the case of an engine of the "Otto" or two-cycle type the oil is admitted into the vaporizer *g* at some point between the end of the exhaust-stroke and the end of the compression-stroke. At the outward or suction stroke the air is drawn into the cylinder through the valve-port *u* in the usual or any suitable manner, and at the following inward stroke the local compression in the inclosed space *e* blows air through the vaporizing-chamber *g*, and thereby displaces the isolated charge of vapor and gas for combustion or explosion, as well as forcing the lighted vapor from the vaporizer to the explosion-chamber at the back of the piston.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to performed, we declare that what we claim is—

In oil-engines, an isolated vaporizing-chamber *g*, fed by oil, and communicating with the main cylinder *a*, and explosion-chamber *l*, by passages *f*, *k;* in combination with the partition *b*, and opening *c*, therein, and the projection *d'*, on the piston *d*, for the purpose and in manner substantially as herein set forth.

HENRY NIELD BICKERTON.
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Witnesses:
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