

No. 677,014.

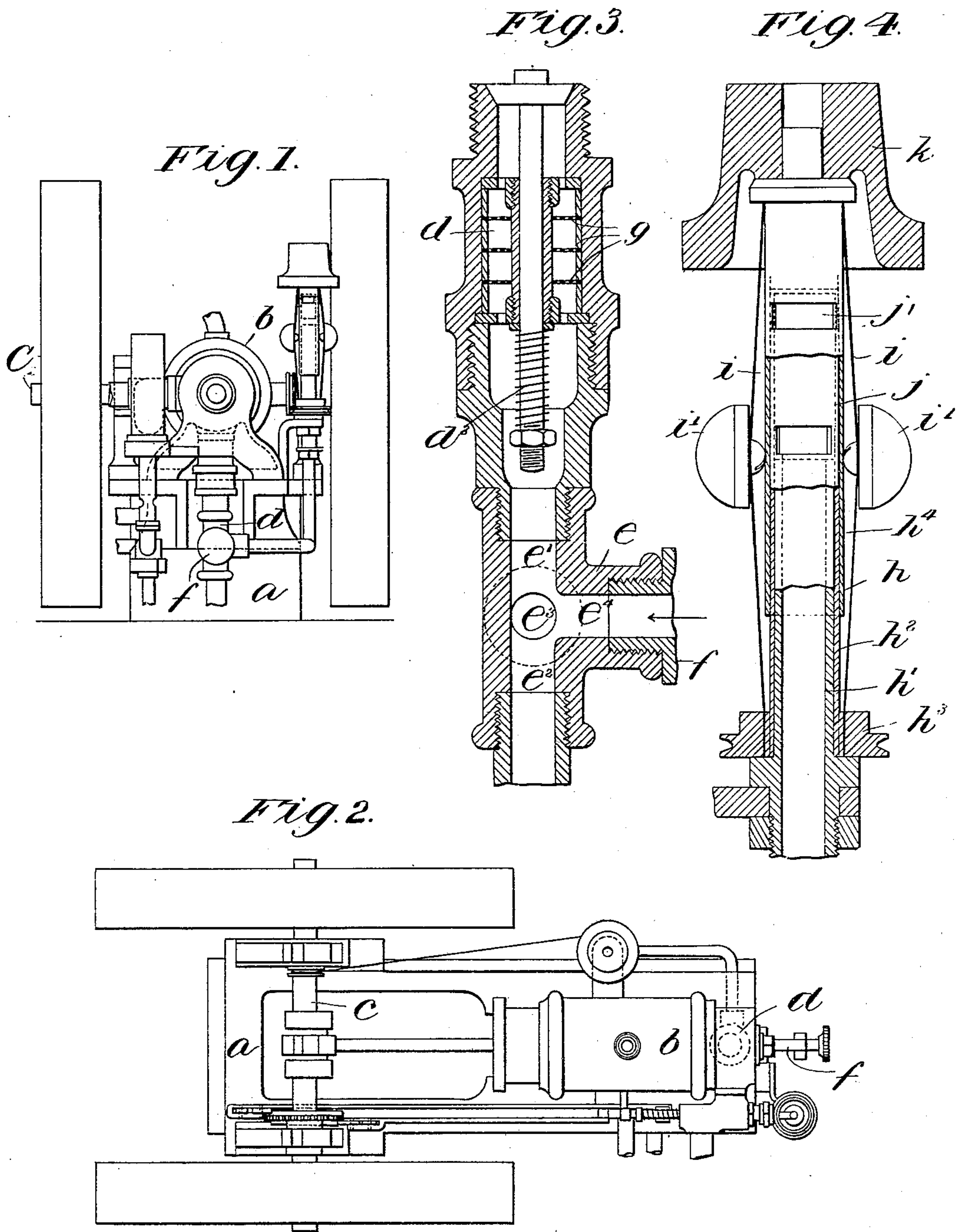
Patented June 25, 1901.

G. BUCK.

SPEED GOVERNOR FOR EXPLOSIVE ENGINES.

(Application filed Mar. 27, 1899.)

(No Model.)



Witnesses.

J. K. Moore
B. W. S. S. S.

Inventor.

George Buck
By his attys
Whitaker & Prevor

UNITED STATES PATENT OFFICE.

GEORGE BUCK, OF LONDON, ENGLAND, ASSIGNOR OF ONE-HALF TO
EDWARD STRONG TORREY, OF SAME PLACE.

SPEED-GOVERNOR FOR EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 677,014, dated June 25, 1901.

Application filed March 27, 1899. Serial No. 710,656. (No model.)

To all whom it may concern:

Be it known that I, GEORGE BUCK, a subject of the Queen of Great Britain, residing at London, England, have invented new and useful Improvements in and Connected with Explosion-Engines, (for which I have applied for a patent in Great Britain, No. 22,707, dated October 28, 1898, and in Germany, No. 24,008, dated December 31, 1898,) of which the following is a specification.

My invention consists in the novel features of construction and combination of parts hereinafter fully described, reference being had to the accompanying drawings, which illustrate one form in which I have contemplated embodying my invention, and said invention is fully disclosed in the following description and claims.

In the drawings, Figure 1 represents an end view of an explosive-engine embodying my invention. Fig. 2 represents a plan view of the same. Fig. 3 is an enlarged detail sectional view of a part of the engine, showing the valve for admitting the explosive charges into the combustion-chamber and the parts connected with said valve. Fig. 4 is an enlarged detail sectional view of the governor and parts connected therewith.

a is the bed-plate of the engine, b the working cylinder which is water-jacketed in the usual way, and c the crank-shaft, all of which parts are of ordinary construction.

d is the passage through which the charges of combustible vapor are drawn into the cylinder, the said passage having arranged within it the valve d' , which is adapted to open by suction and to be closed upon its seat by a spring d^2 . This passage d has arranged in conjunction with it a fitting or junction-piece e , (shown in Fig. 3,) which has four branches e' e^2 e^3 e^4 , the branch e' being connected with the passage d , the branch e^2 with the gas-supply or with an apparatus for supplying hydrocarbon vapor, the branch e^3 with the atmosphere and serving as the main air-supply (the said branch being provided with a regulator f , Figs. 1 and 2) for controlling the quantity of air passing through the said branch, and the branch e^4 also with the atmosphere. This branch e^4 , however, is arranged, in conjunction with a valve or regu-

lating device in connection with the engine-governor, in such a manner that the said valve will be completely closed or more or less opened according to the action of the governor, the said governor by admitting a greater or less quantity of air in addition to that entering through the main air-supply serving to more or less dilute the explosive charges. It is to be understood that in practice the regulator f on the main air-supply is so adjusted that at normal speeds of the engine the requisite quantity of carbureted air or gas will be drawn through the gas-supply and mingle with the air drawn through the main air-supply to form the explosive mixture and that by adjusting this regulator a greater or less quantity of air or gas will be drawn through the gas-supply.

In the passage d , containing the valve d' , a series of plates g , Fig. 3, of wire-gauze or the like, is preferably arranged in order to insure a thorough mixing of the gas or vapor and air before the latter are drawn into the cylinder and to obviate any liability of back-lighting.

h is the governor which I make use of and which is shown detached in Fig. 4. This governor has three tubes—namely, an inner fixed tube h' , which forms a spindle for the governor to rotate upon and through which the auxiliary air-supply passes; an outer tube h^2 , which fits over the tube h' , but which is longer than the latter and provided with a pulley or other device h^3 , by which it may be rotated from the engine, and a third tube or cap h^4 , which fits over the tube h^2 . The tubes h^2 and h^4 have connected to their lower and upper ends, respectively, arms or springs i i , carrying weights i' i' , in such a manner that when the governor is rotated the centrifugal action will cause the tube h^4 to slide more or less upon the tube h^2 . Through the tubes h^2 h^4 are formed openings j j' , respectively, so arranged that in the normal position of the governor these openings do not coincide. When, however, the tube h^4 is caused to slide more or less upon the tube h^2 , the opening j' will be brought more or less opposite the opening j , so as to admit a greater or less volume of air, which will be drawn through them by the suction-stroke of the engine.

k is a weight placed upon the top of the governor, which can be removed and replaced by others of different weights, if desired, thereby adjusting the governor to maintain the engine at different speeds.

The operation of the apparatus as thus far described is as follows: On the outstroke of the piston air is drawn in through the branch e^3 and gas through the branch e^2 , the said air and gas passing together into the passage d , where they are thoroughly mixed, and then flowing past the valve d' into the cylinder. On the return stroke of the piston these gases are compressed and ignited in any desired way.

Should the engine run at more than normal speed, so that the centrifugal governor h would act to cause the tube h^1 to slide upon the tube h^2 to more or less open the ports j, j' in the governor, an additional supply of air to that which is introduced through the passage e^3 would flow through the passage e^4 , and thereby dilute the normal explosive mixture to such an extent that the next explosion would be less violent than if no air had been admitted through the passage e^4 .

What I claim, and desire to secure by Letters Patent, is—

1. In an explosion-engine wherein the action of a centrifugal governor is utilized for admitting more or less air into the explosive charge in addition to the normal quantity of air necessary for the said charge, a governor having a fixed tubular spindle and two tubes rotating upon it and connected with the balls or weights of the governor, the said tubes having formed through them openings so arranged that when the engine is running at a normal speed the said openings are out of coincidence but that when the normal speed is exceeded the said tubes will slide one upon the other in order to bring the said openings more or less into coincidence and allow air to flow into and through the spindle of the governor, substantially as described.

2. In an explosive-engine, the combination with the cylinder provided with an inlet-passage for the explosive mixture, of a valve controlling said passage, an explosive-material supply for said passage, an air-supply for said passage, including a tube communicat-

ing with said passage provided with a lateral air-inlet aperture, a second tube telescopically engaging said first tube movable longitudinally thereof and provided with an air-inlet aperture normally out of line with the inlet-aperture of the other tube and a governor operatively connected with said movable tube, and adapted to bring the apertures in the said tubes more or less nearly into registering position, substantially as described.

3. In an explosive-engine, the combination with the cylinder provided with an inlet-passage for the explosive mixture, of a valve controlling said passage, an explosive-material supply for said passage, an air-supply for said passage, including a revoluble tube communicating with said passage and provided with an inlet-aperture, a second tube mounted telescopically with respect to the first tube, adapted to rotate therewith and slide longitudinally with respect thereto and provided with an air-inlet aperture normally out of line with the inlet-aperture in the other tube, centrifugal governing-weights carried by said tubes and operatively connected therewith to move said movable tube to bring the said inlet-apertures more or less nearly into registering position, substantially as described.

4. In an explosive-engine, the combination with the cylinder provided with an inlet-passage for the explosive mixture, of a valve controlling said passage, an explosive-material supply for said passage, an air-supply for said passage, an adjustable controlling-valve for said air-supply, a separate auxiliary air-supply for said passage, including a tube communicating with said passage, provided with a lateral air-inlet aperture, a second tube telescopically engaging said first tube movable longitudinally thereof, and provided with an air-inlet aperture normally out of line with the inlet-aperture of the other tube and a governor operatively connected with said movable tube and adapted to bring the apertures in the said tubes more or less nearly into registering position, substantially as described.

GEORGE BUCK.

Witnesses:

JOHN E. BOUSFIELD,
A. ALBUTT.