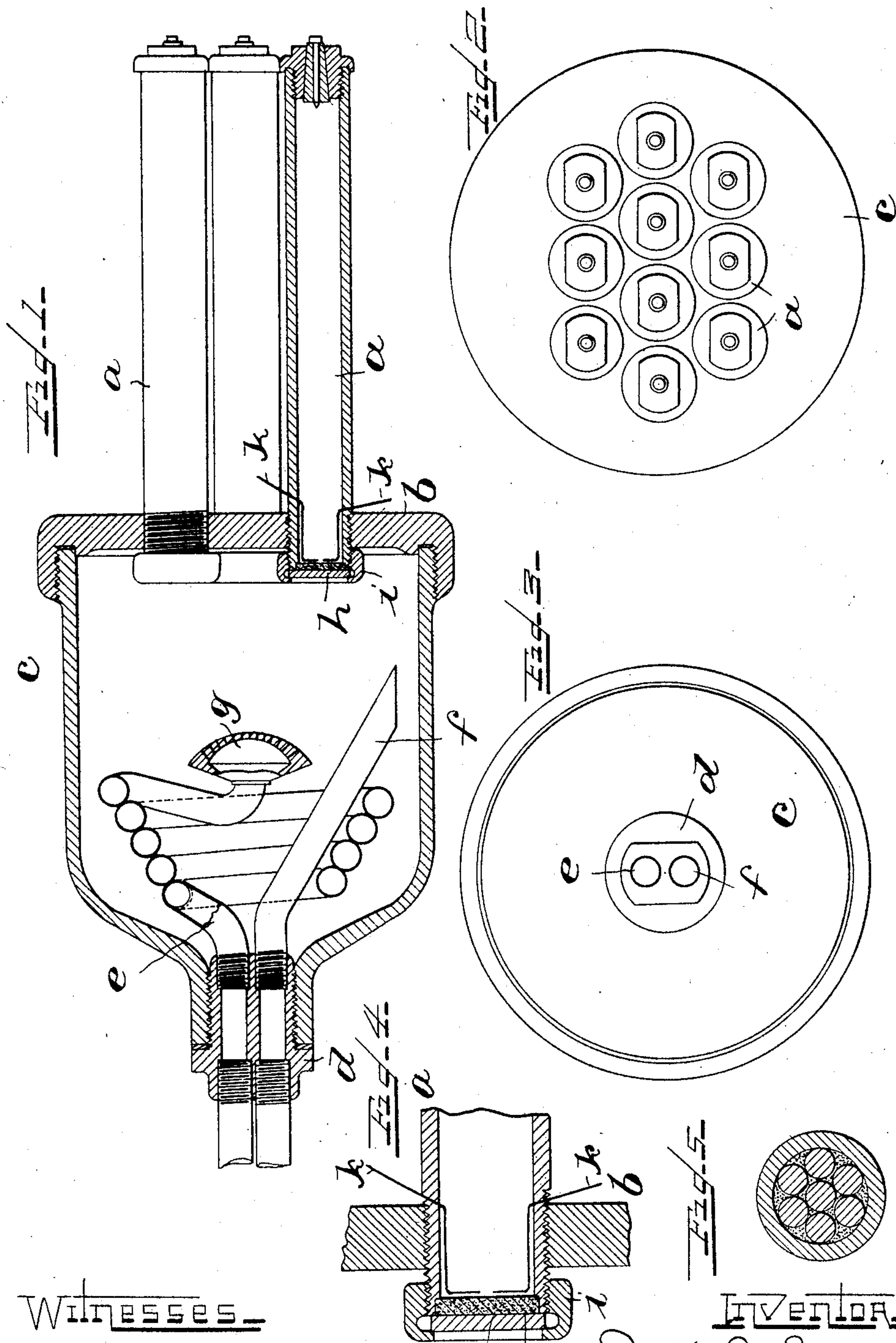


(No Model.)

D. D. ESSON.
COMBUSTIBLE COMPOUND.

No. 580,612.

Patented Apr. 13, 1897.



Witnesses.

J. D. Kingbury
G. C. Shinn

Inventor _____

David D. Esson
By Whitaker & Nevost
Attys.

UNITED STATES PATENT OFFICE.

DAVID DUNCAN ESSON, OF FAVERSHAM, ENGLAND, ASSIGNOR TO THE
ESSON MOTOR, LIMITED, OF LONDON, ENGLAND.

COMBUSTIBLE COMPOUND.

SPECIFICATION forming part of Letters Patent No. 580,612, dated April 13, 1897.

Application filed November 7, 1896. Serial No. 611,372. (No specimens.)

To all whom it may concern:

Be it known that I, DAVID DUNCAN ESSON, a subject of the Queen of Great Britain, residing at Faversham, in the county of Kent, England, have invented a new and useful Improved Combustible Compound or Fuel, of which the following is a specification.

My invention relates to a combustible compound or fuel capable of burning in a closed chamber without the addition of air and, if desired, in contact with water, and of giving off large volumes of gas for maintaining a high pressure.

My improved compound contains nitroglycerin, dry guncotton, vaseline, and camphor. In practice I have found it advantageous to mix these ingredients in the following proportions, viz: nitroglycerin, fifty-five parts by weight; dry guncotton, thirty parts by weight; vaseline, ten parts by weight; camphor, five parts by weight.

The camphor serves to delay the combustion of the explosive ingredients, so that the production of the gases of combustion is not so sudden as to cause an explosion, and by increasing or diminishing the proportion of camphor the combustion can be correspondingly retarded or accelerated. In combining these ingredients I prefer to mix intimately the nitroglycerin, guncotton, and a portion of the vaseline and to use the other portion of the vaseline and the camphor as a coating for the other part of the compound.

In using my compound the mixture of nitroglycerin, guncotton, and part of the vaseline is preferably made up in the form of rods or sticks which are placed singly or in groups in tubes or the like, the mixture of camphor and vaseline serving to fill the spaces around and between the said rods or sticks and the tubes.

In the accompanying drawings I have illustrated a form of apparatus which may be advantageously employed in using my improved material for the generation of fluid-pressure.

In the said drawings, Figure 1 is a longitudinal section of the apparatus. Figs. 2 and 3 are opposite end elevations of the same. Fig. 4 is a detail sectional view of one of the feeding-tubes adjacent to its inner end. Fig. 5 is a transverse sectional view of one of said

tubes, showing several rods of my combustible compound placed therein.

In the drawings, *c* represents an inclosed chamber, provided at one end with a tube-plate *b*, through which extends the ends of a series of tubes *a*, said tubes being preferably screwed into threaded apertures in the plate *b*. The opposite end of the chamber *c* is provided with an aperture, fitted with a screw-nipple *d*, through which extends two tubes *e f*, the former serving to convey water into the chamber *c* and the latter serving as a discharge-passage for said chamber. The pipe *e* is formed into a series of coils within the chamber *c* and is provided at its inner end with a rose or spray-nozzle *g*.

The inner end of each tube *a* is provided in this instance with a disk *h*, held in place by a ring or collar *i*, screwed onto the end of the tube *a*, and *j* represents a disk or packing of asbestos or other non-heat-conducting material to prevent the heat in the chamber *c* from prematurely igniting my combustible compound. I also provide igniting devices for the tubes *a*, so that the combustible material within the same can be ignited singly or simultaneously, as desired. In the drawings I have shown each tube provided with electric wires *k k* for conveying electricity and producing a spark within the tube at a point adjacent to its mouth for the purpose of igniting the material therein.

In operation the rods or sticks of my combustible compound are placed in the tubes *a*. Each tube may contain a single rod, or, as shown in Fig. 5, I may place a number of small rods in the tube and fill the intervening spaces with the mixture of camphor and vaseline, as indicated. The material in one tube (or several, if preferred) is ignited by means of an electric spark or otherwise, thereby blowing off the disk *h* and asbestos *j* and allowing the hot gases from the combustible material, which burns slowly and without explosion, to pass into the chamber *c*. Water is introduced into the chamber *c* through the pipe *e*, becomes heated in passing through the coil which is surrounded by the hot gas, and is injected by the nozzle *g* in the form of spray into the hot gas, where it is instantly vaporized, producing large volumes of steam,

which are discharged from the chamber *c* by means of the pipe *f*. If a single tube is ignited, as soon as the material therein has been consumed the material in another tube is ignited in a similar manner, so that the process of forming steam continues without interruption.

The apparatus herein shown and described is covered by an application for Letters Patent filed by me November 7, 1896, and given Serial No. 611,373, and is therefore not claimed herein.

I do not, however, limit myself to the use of my improved combustible compound in the manner described or in connection with the apparatus herein referred to.

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

1. The improved combustible compound or

fuel consisting of nitroglycerin, dry guncotton, vaseline and camphor in substantially the proportions stated, and mixed or combined substantially in the manner described. 25

2. The herein-described combustible compound or fuel consisting of nitroglycerin, dry guncotton, and vaseline mixed together and coated with a mixture of vaseline and camphor, substantially as described. 30

3. As a new article of manufacture, the herein-described combustible compound or fuel consisting of nitroglycerin, dry guncotton and vaseline mixed together and formed in sticks or rods, said sticks or rods being coated with a mixture of vaseline and camphor, substantially as described. 35

DAVID DUNCAN ESSON.

Witnesses:

JOHN E. BOUSFIELD,
C. G. REDFERN.