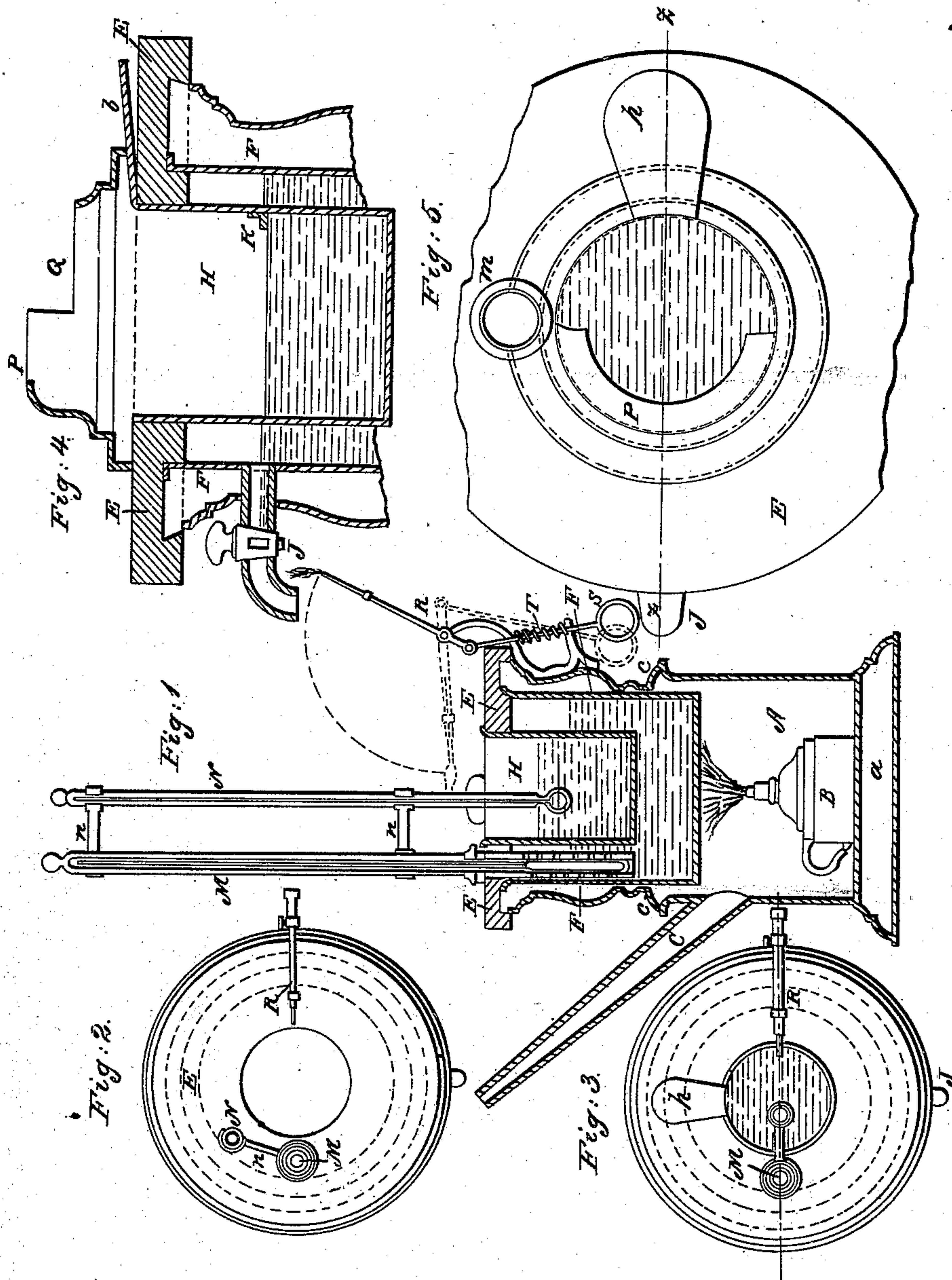


G. E. SHAW.  
Carbon Oil Fire Tester.

No. 56,107.

Patented July 3, 1866.



Witnesses:  
Camille Dwy  
H. P. Gengembre

Inventor:  
Geo. E. Shaw



# UNITED STATES PATENT OFFICE.

GEO. E. SHAW, OF PITTSBURG, PENNSYLVANIA.

## IMPROVED CARBON-OIL FIRE-TESTER.

Specification forming part of Letters Patent No. 56,107, dated July 3, 1866.

*To all whom it may concern:*

Be it known that I, GEO. E. SHAW, of the city of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and Improved Carbon-Oil Fire-Tester; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a sectional view, in elevation, of my improved fire-tester through the line *x x*. Fig. 2 is a top view of the same with the oil-cup removed and the oil-thermometer turned away out of use. Fig. 3 is the same view as Fig. 2, but with the oil-cup in place and the oil-thermometer turned in its proper place for use. Fig. 4 is a sectional view (full size) of a part of the oil-cup and water-bath with the shield cut through the line *z z*, and Fig. 5 is a top view of Fig. 4.

My invention relates to those apparatus for testing the point at which carbon-oil, coal-oil, or other liquid hydrocarbons will ignite or evolve inflammable vapors, and known generally as oil fire-testers; and it consists in an entirely new and improved mode of construction of the said apparatus, by which greater accuracy is obtained in the observations and uniformity of results obtained.

My invention may be divided into five most important improvements, which are as follows: First, the mode of applying the heat to the oil; second, the regulating of the level of the oil and of the water in the water-bath; third, the accuracy and certainty in reading the exact temperature of the oil; fourth, the constant and regular atmospheric influence on the surface of the oil; and, fifth, the mathematical method of applying the fire-brand or match to the heated oil.

To enable others skilled in the art to make and use my improved fire-tester, I will proceed to describe its construction and operation.

A is a furnace of metal, having a base, *a*, and a door to introduce the lamp B, and a pipe or flue, C, for carrying away from the apparatus any surplus of heat evolved from the lamp B and not absorbed by the bottom of the water-bath D, thereby preventing the part *cc* from becoming too heated.

D is a water-bath, which is composed of one

inner cup, of metal, one outer shell, also of metal, and of the top E. This top E is marble, stone, wood, cork, hardened rubber, glass, or any other non-conductor of heat, and the space F is filled also with any non-conductor of heat. In the present case I have used plaster-of-paris mixed with charcoal.

H is a cup of thin metal, having a handle, *h*, and fitting nicely in the central hole of the marble top of the water-bath.

It will be observed that the above arrangement is such that no heat is transmitted to the cup H except through the water in the bath, so that only the oil is heated, and the vapors arising from it will not be superheated, as is the case in all the apparatus now used, by contact with the heated apparatus.

In order to have the water in the water-bath and the oil in the oil-cup exactly on the same level the spigot J is provided to the water-bath, and a gage-mark, K, is fastened inside the oil-cup, so that when the oil-cup is in place the spigot and the gage-mark are on the same level, and that when the oil-cup is filled up to the gage-mark K and the spigot J left to run out the excess of water in the water-bath both liquids will be exactly on a level one with the other.

To insure perfect accuracy in ascertaining the temperature of the oil in the cup H, I employ a combination of two thermometers. The one, M, mounted in a brass casing pivoted in a ferrule, *m*, Fig. 5, fastened to the top piece, E, of the water-bath, penetrates and is immersed in the water of the said water-bath. The other, N, incased in a glass case, is held by two spring-arms, *n n*, and can be lowered in the oil-cup, so as to be immersed in the oil, (see Figs. 1 and 3,) or raised up and turned away out of use, (see Fig. 2,) so as to allow of the cup H being removed. By this combination of thermometers not only does the one control the reading of the other, but they will indicate by their difference if the oil is rising in temperature or falling, by this obtaining great accuracy.

In order to obtain a constant atmospheric influence on the surface of the oil I use the shield P, Figs. 4 and 5. This shield is made to cover one-half of the oil-cup on the side where the operator is placed, so as to avoid

the action of his breathing, which disturbs the atmospheric influence, and the part Q is left open to allow free access to the air and room for the introduction of the thermometer N and fire-brand.

To obtain a mathematically-correct application of the fire-brand I use the pivoted-lever brand-bearer R, combined with the ringed rod S and the spring T, so that the operator can, by pressing his finger on the ring S and bringing it nearer the center of the apparatus, cause the fire-brand to be thrown in the position indicated by the dotted lines without loss of time and in a most perfect manner.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. The water-bath D, with its double casing F and top E, as described, and the pipe C, for the purpose of obtaining heat from the bottom only, as specified.

2. The combination of the two thermometers M and N with the water-bath D and oil-cup H, for the purpose specified.

3. The shield P with its notch Q.

4. The combination of the pivoted-lever fire-brand holder R with the ring and rod S and the spring T, arranged as described, and acting as specified.

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Witnesses:

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