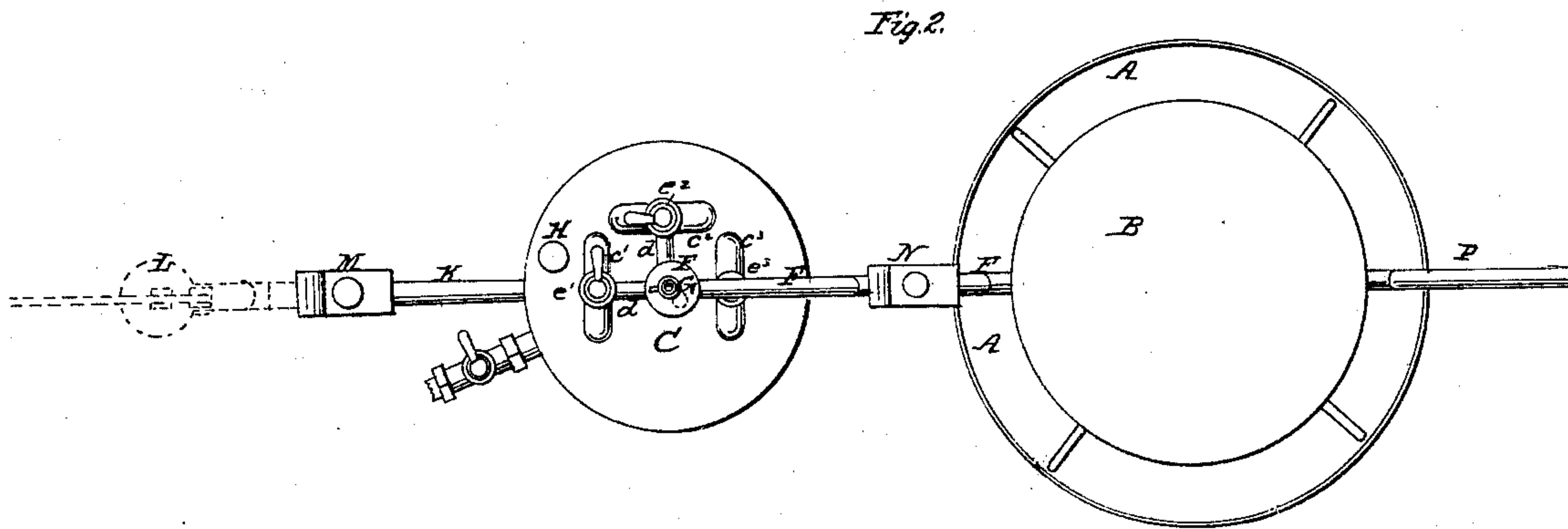
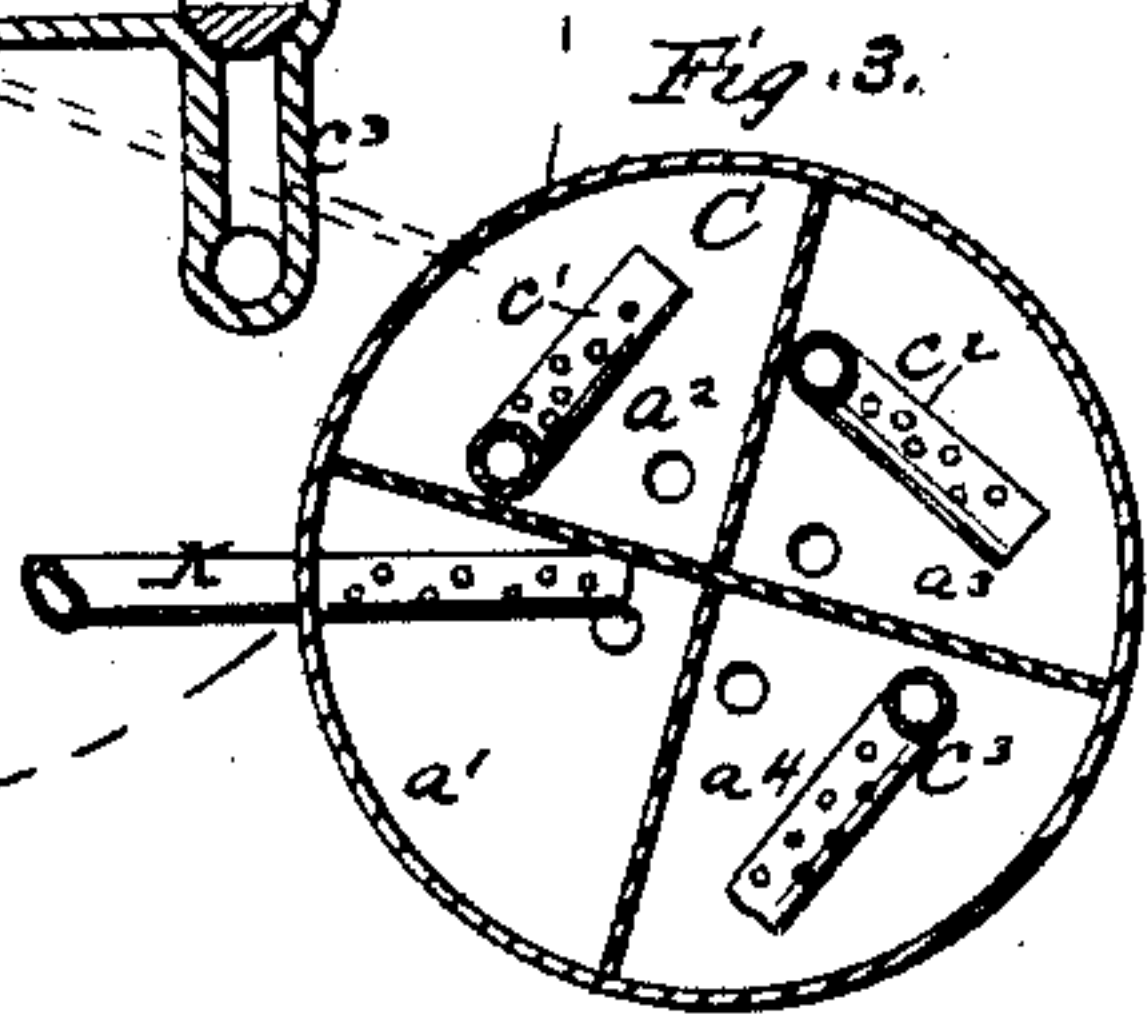
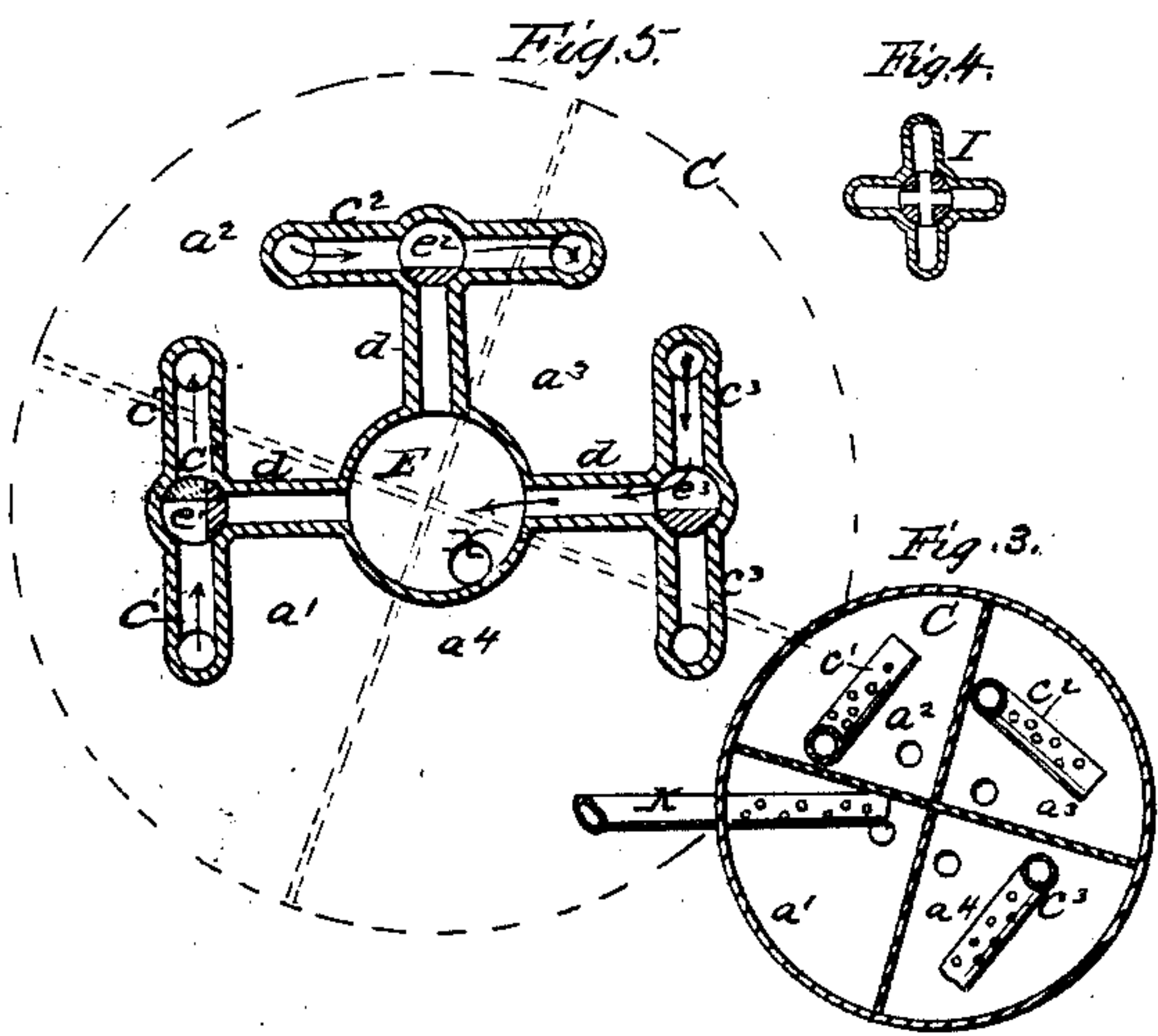
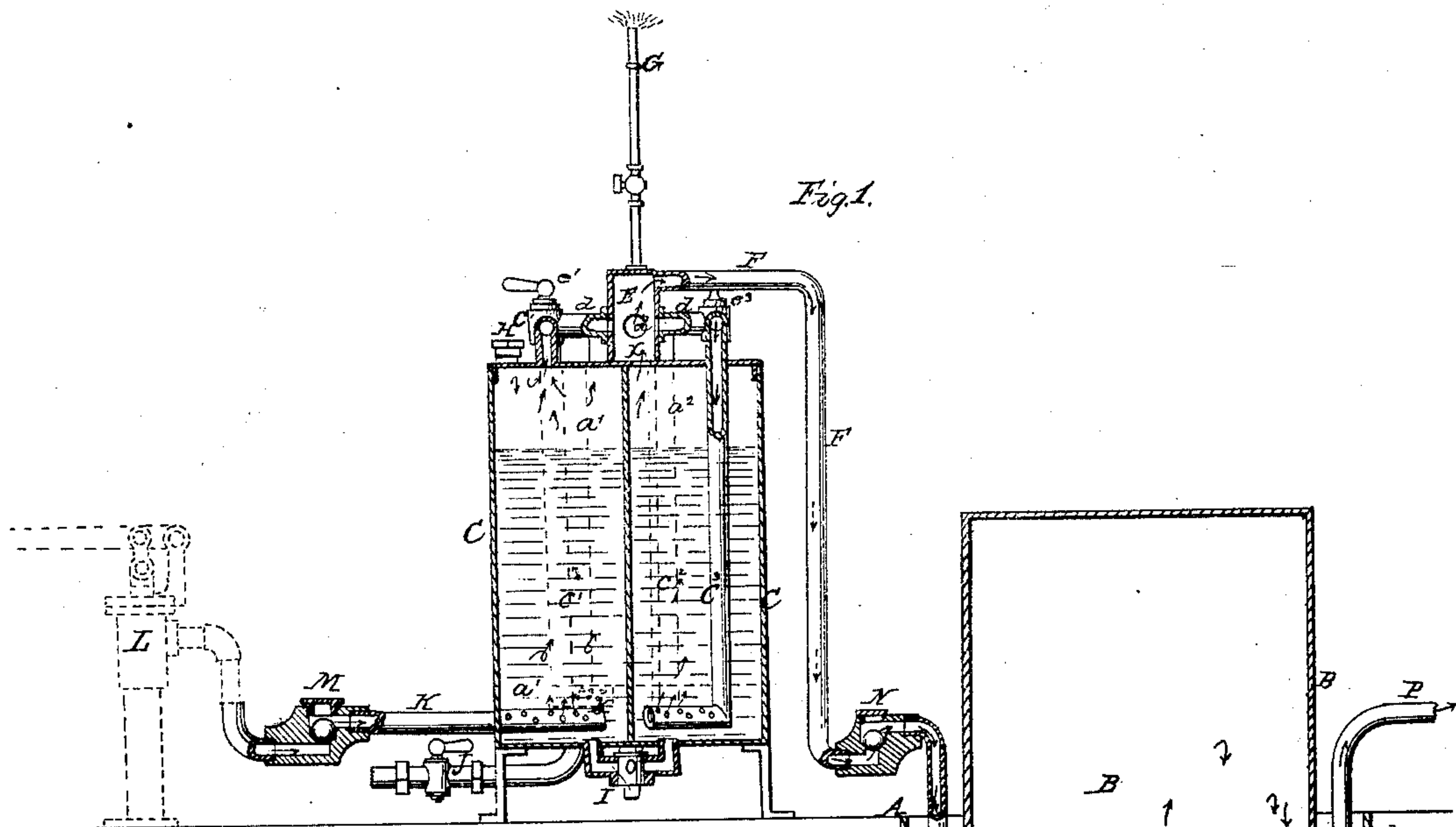


A. C. Rand,
Manufacturing Illuminating Gas.
No 62,363. Patented Feb. 26, 1867.



UNITED STATES PATENT OFFICE.

ALONZO C. RAND, OF UNION MILLS, PENNSYLVANIA.

IMPROVEMENT IN THE MANUFACTURE OF ILLUMINATING-GAS.

Specification forming part of Letters Patent No. 62,363, dated February 26, 1867.

To all whom it may concern:

Be it known that I, ALONZO C. RAND, of Union Mills, Erie county, and State of Pennsylvania, have made certain new and useful Improvements in the Manufacture of Illuminating-Gas; and I hereby declare that the following is a full and exact description of the same, reference being made to the drawings and letters marked thereon, which form a part of this specification, in which—

Figure 1 represents a vertical central section of my apparatus; Fig. 2, a top view of the same. Fig. 3 is a horizontal section of the carbureter. Fig. 4 is a horizontal section of the equalizing-cock. Fig. 5 is a detached horizontal section of the three-way cocks for connecting or disconnecting the generating or carbureting chambers.

Similar letters of reference indicate corresponding parts in the several figures.

The nature of my invention consists, first, in providing the tank or vessel containing the hydrocarbon with compartments connected with pipes and stop-cocks, for the purpose of incorporating with the air a uniform or proper proportion of carbon to make it a good illuminator, irrespective of the specific gravity of the hydrocarbon used; secondly, in the employment of connecting pipes and cocks used to connect the compartments and maintain a uniform depth of hydrocarbon in each compartment; thirdly, in having the outlet of the pipe used to deliver the carbureted air into the gas-holder on the bottom of the water-tank, that the carbureted air may be made to pass through the water, and by this means prevent any condensation in the pipes leading to the burners, as any condensation of the vapors would take place in the water before they reached or entered into the gas-holder.

Having described the nature of my invention, I now proceed to give a description of its various parts and mode of operation.

A, Figures 1 and 2, represents the water-basin, and B the gas-holder, both of which are constructed in the usual manner. C, Figs. 1 and 3, represents the tank or vessel used to hold the hydrocarbon. It is constructed with four equal compartments or generators, $a^1 a^2 a^3 a^4$. These compartments are connected with each other by means of the passages $c^1 c^2 c^3$, (shown in Fig. 5,) and they are also connected with the

central chamber E by means of passages $d d d$. The same passages are connected or disconnected, at the will of the operator, by the cocks $e^1 e^2 e^3$, so that the compartments $a^1 a^2 a^3$, also the central chamber E, are connected or disconnected by means of the cocks $e^1 e^2 e^3$. The chamber E is connected with the gas-holder B by means of the pipe F. Said chamber is provided with a small gas-burner, G, for the purpose of testing the quality of the gas during its manufacture. The vessel C is provided on its top with an opening, H, for the purpose of filling the said compartments.

In order to have an equal amount of liquid in each compartment, the said vessel is provided on its bottom with a four-way cock, I, connecting or disconnecting all of said compartments. J is a cock for drawing off the liquid from the vessel. K is a pipe for introducing the air into the said vessel by the pump L. M is a check-valve, placed between the pump and vessel in the pipe K, to prevent the back flow of the liquid from the vessel C to the pump. The pipe K is introduced into the compartment a^1 , and is provided with small perforations to separate the air introduced into said compartment. The pipe F is supplied with a check-valve, N, between the vessel C and water-basin A, to prevent the back flow of water from the basin A, and the outlet of said pipe is perforated, as shown by O. P is a pipe, arranged in the usual manner, for delivering the gas from the gas-holder. One end of each of the passages $c^1 c^2 c^3$ is connected with the top of one compartment. Each of the other ends terminates at the bottom of the adjoining compartments, and are provided with perforations.

The operation is as follows: The air is forced by the pump L into the first compartment a^1 . From thence it passes upward through the liquid and through passage c^1 down to the bottom of the adjoining compartment a^2 , and again passes upward through the passage c^2 , and therefrom through the other compartments in the same manner, until it reaches or is received into compartment a^4 , from which it is delivered through the opening X into the chamber D, from which it passes into the lower part of the basin A. It is then obliged to pass upward through the water into the gas-holder B, that any vapors may condense in the water, thereby preventing condensation taking

place in the pipes leading to the burners. From the gas-holder it is delivered by the usual delivery-pipe P.

If the hydrocarbon is of very light gravity the air will be sufficiently carbureted by passing through one compartment. The communication to the next compartment is closed by means of the cock e^1 , and the communication through the passage e^1 into chamber E is opened and the gas passes through pipe F into the gas-holder.

The construction of these compartments being precisely similar, and the mode of carbureting being alike in each compartment, it will be readily understood that the number of compartments necessary to use is dependent upon the specific gravity of the hydrocarbon contained in the vessel or generator.

The quality of the gas is readily ascertained during the process of its manufacture by the use of the gas-light test G. This insures uniformity of quality. As, during the process of its manufacture the gravity of the hydrocarbon is becoming lower, the lighter or more volatile portions of it are more rapidly taken up by contact with the air; therefore the utility or necessity of using the test-light to ascertain when it is necessary to pass it through two or more com-

partments in order to insure its being charged with sufficient carbon to become a good illuminator. After all the lighter portions of the hydrocarbon are taken up by this process, heated air may be introduced by means of a coil in the suction-pipe to the pump, which may be heated by gas supplied from the gas-holder.

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

1. So arranging the gas-generator or carbureting apparatus with a series of compartments or generators with stop-cocks that the air may be driven through the liquid contained in one or more compartments, for the purpose and in the manner herein described.

2. The combination of the test-light G and its connection with the series of compartments or generators $a^1 a^2 a^3 a^4$, substantially as and for the purpose herein described.

3. The employment of the cock or cocks I, arranged on the lower part of the generators to connect or disconnect the same, substantially as and for the purpose described herein.

ALONZO C. RAND.

Witnesses:

E. D. POUNDSHIRE,
C. L. SHERWOOD.