

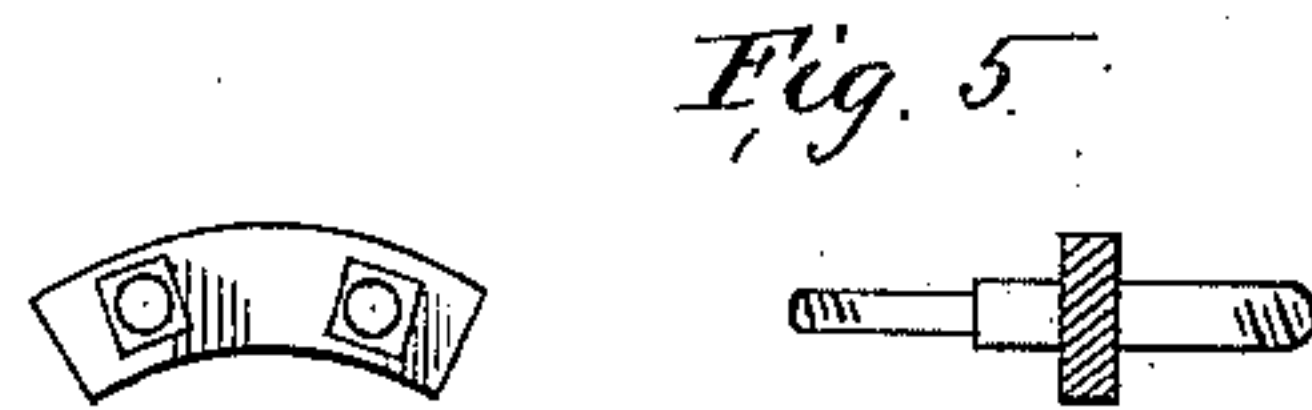
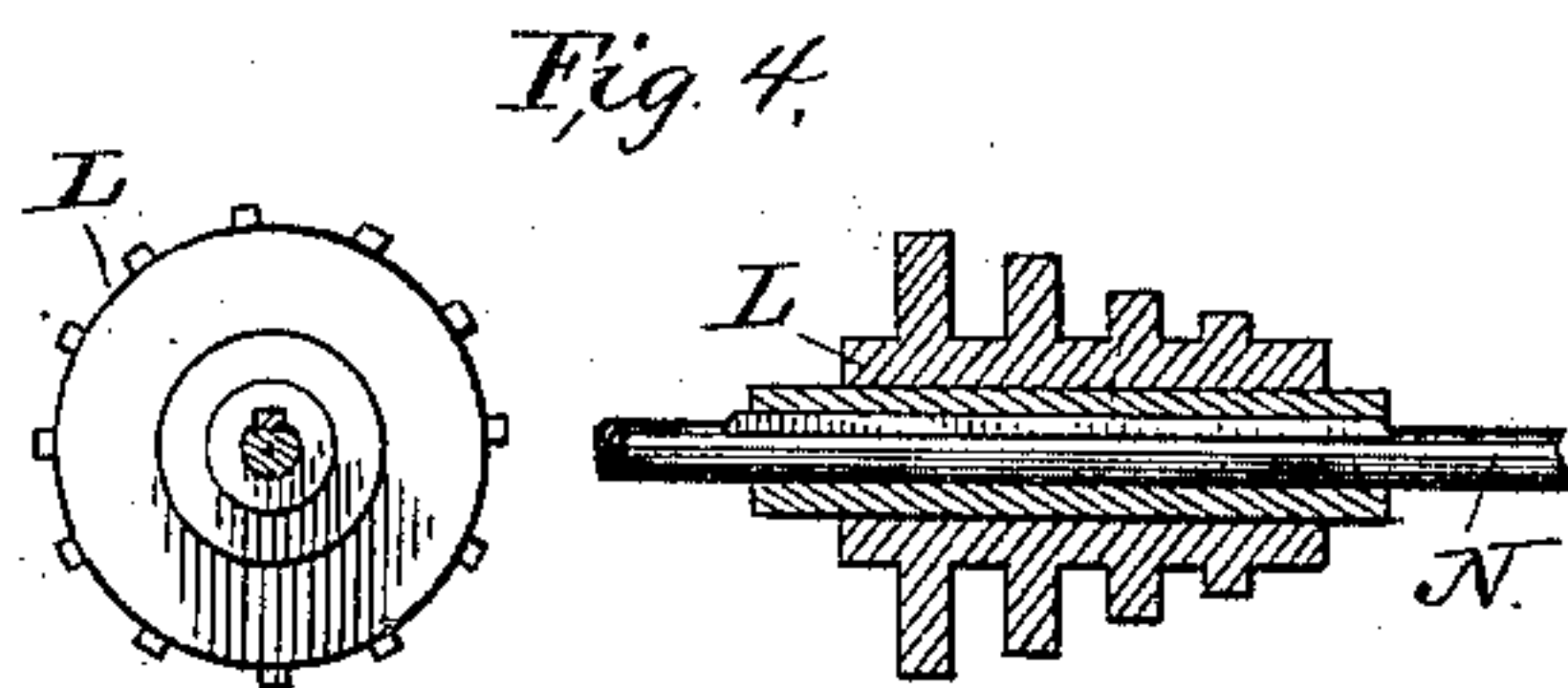
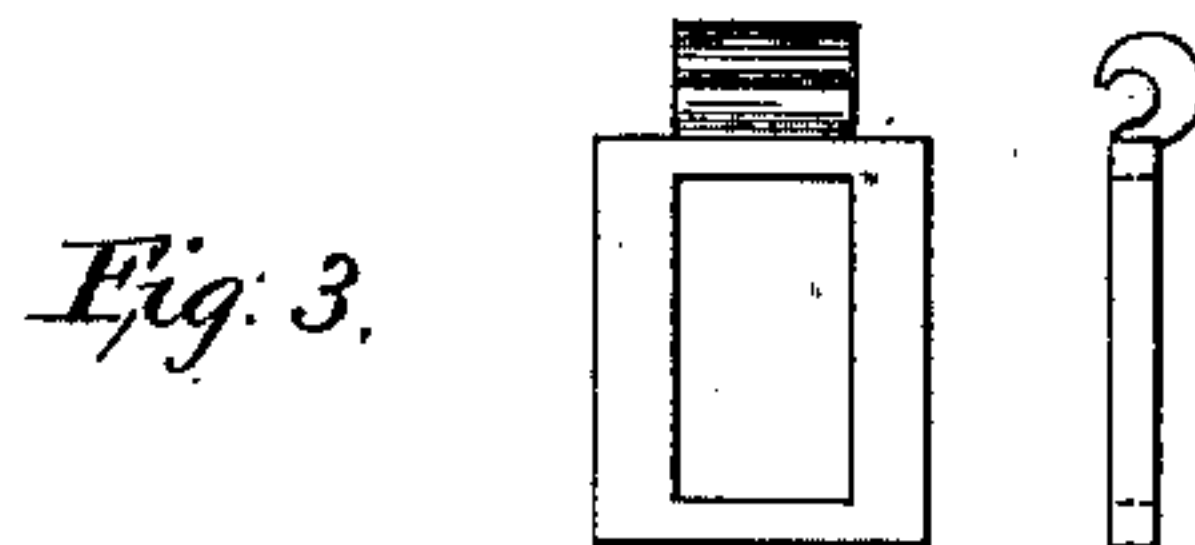
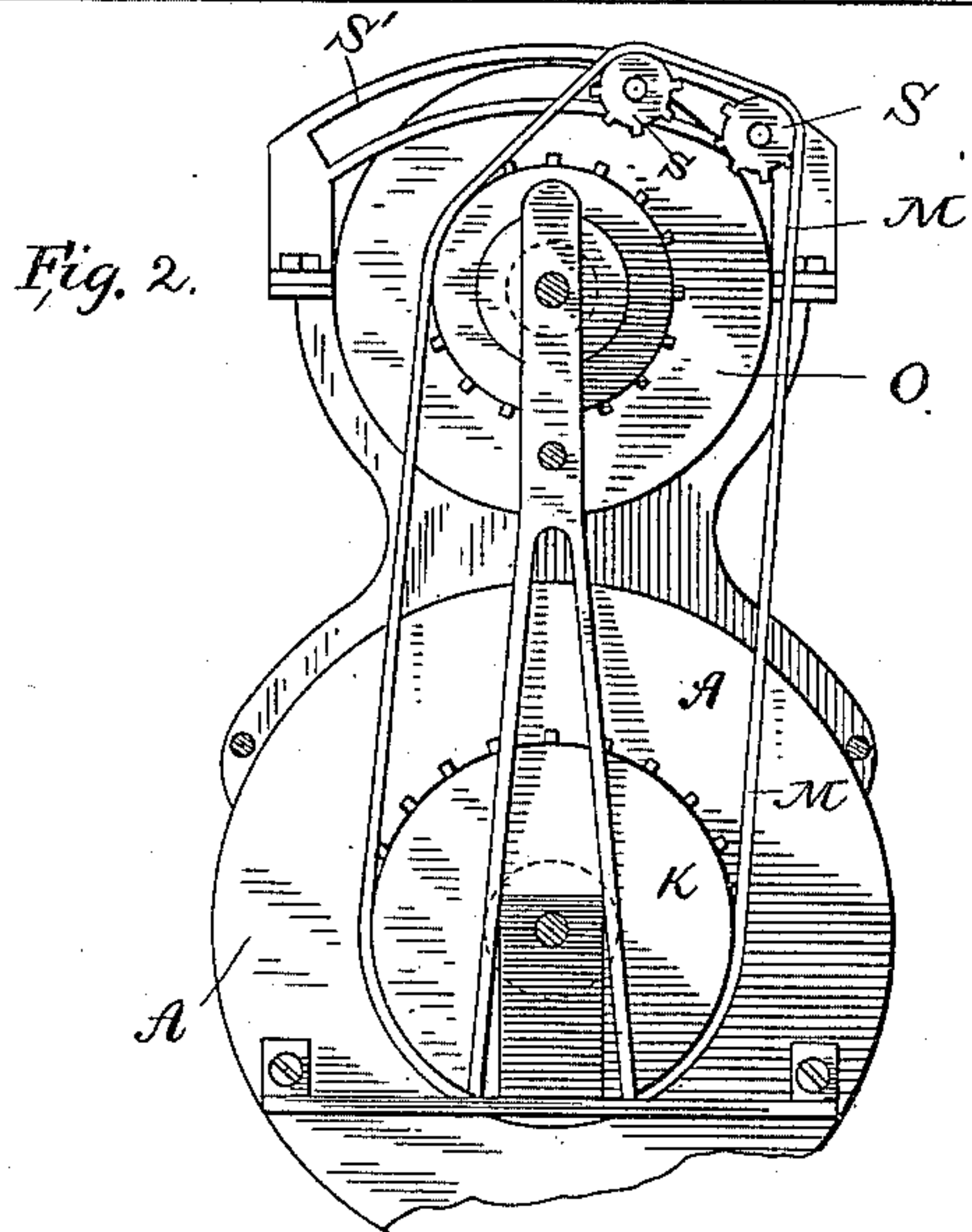
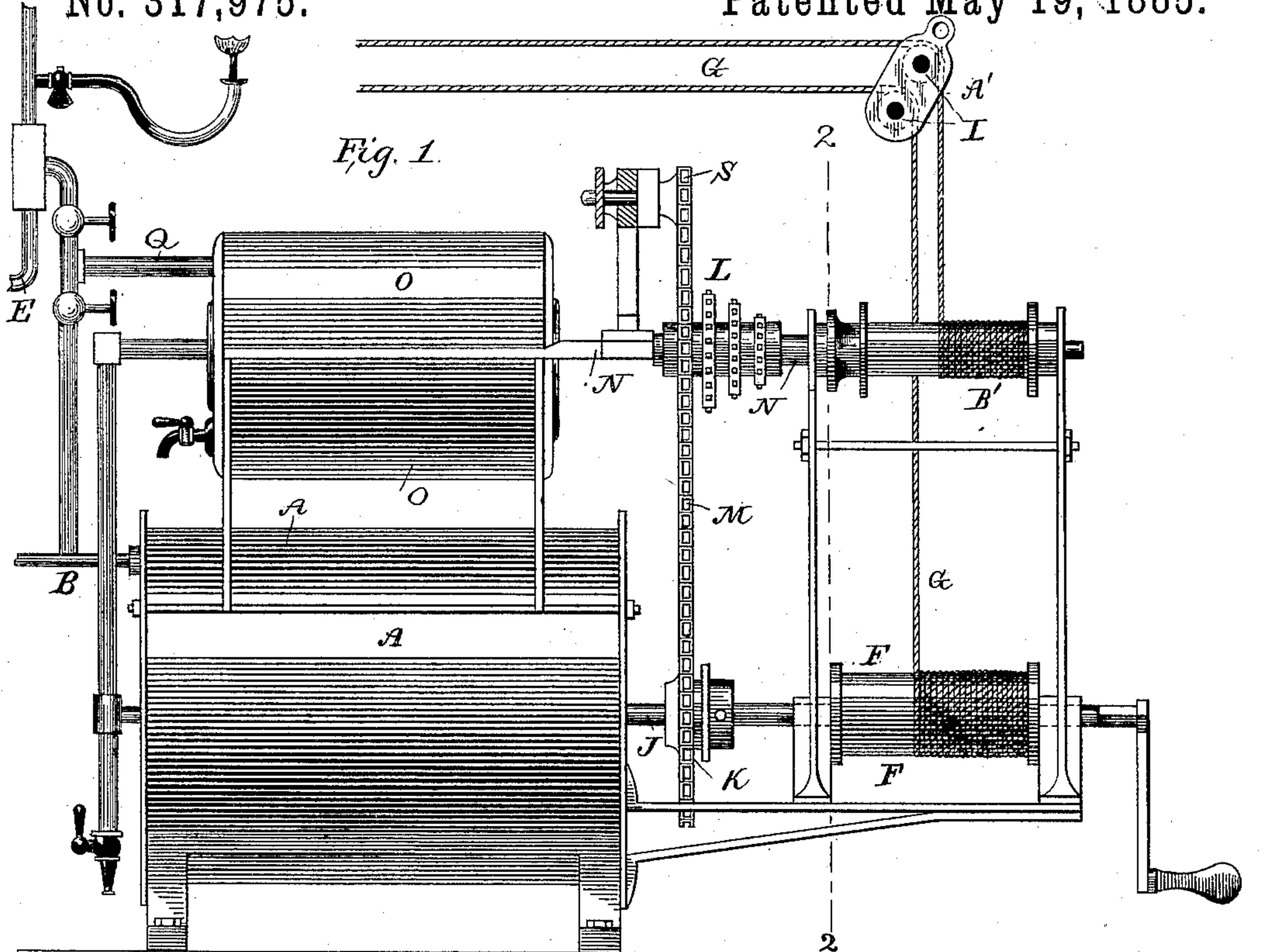
(No Model.)

J. P. CLIFFORD.

ADJUSTABLE APPARATUS FOR GAS MACHINES AND MIXERS.

No. 317,975.

Patented May 19, 1885.



Attest:—
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UNITED STATES PATENT OFFICE.

JAMES P. CLIFFORD, OF NEW HAVEN, CONNECTICUT.

ADJUSTABLE APPARATUS FOR GAS MACHINES AND MIXERS.

SPECIFICATION forming part of Letters Patent No. 317,975, dated May 19, 1885.

Application filed April 1, 1884. (No model.)

To all whom it may concern:

Be it known that I, JAMES P. CLIFFORD, a citizen of the United States, residing at New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Adjustable Apparatus for Gas Machines and Mixers, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to that class of "air-gas machines," so termed, in which atmospheric air is charged or saturated with the vapor of a light hydrocarbon, such, for instance, as gasoline. In such apparatus it frequently occurs that when the generator or tank is first filled the air becomes charged with a proportion of the hydrocarbon vapor in excess of what is required for the production of a high grade of illuminating-gas, which not only results in the waste of the hydrocarbon material, but in a smoky flame.

The object of this invention is to produce a convenient and effective means of diluting the gas when thus charged to excess; and it comprises certain novel combinations of parts, whereby an additional quantity of atmospheric air may be mingled with the gas as the same is passed through the conducting-pipes toward the burners, all as hereinafter described and claimed.

The gas-machine itself may be of any ordinary or suitable construction, provided with a pump, which forces the air to the generator to be carbureted, thence to the building to be lighted to be consumed at the burner.

It matters not which way the gas-machine is set up, whether it be on the pressure or induction plan, the operation and results of the mixer are precisely the same. All the difference there is between the pressure plan of operating a gas-machine and the induction plan of operation is that on the pressure plan the gas is forced by the air-pump directly from the generator buried in the ground to the conducting and branch pipes in the building to be consumed at the burners. The induction plan is to induct the air into the carburetor and the resulting gas into the pump in the cellar of the building lighted. The gas is then delivered from the pump in the cellar of the building lighted to the burners to be consumed.

In the accompanying drawings, Figure 1 represents a side elevation of my present improvements. Fig. 2 represents a vertical section on the line 2 2 of Fig. 1. Fig. 3 represents, respectively, a front and a side elevation of one of the links of the belt. Fig. 4 represents, respectively, an end view and a longitudinal section of the shaft and cone-pulleys. Fig. 5 represents in elevation the idler bearing-block and bearing-spindle.

A represents the air-pump, which forces the air through the pipe B to a generating-tank, where it becomes thoroughly saturated with the vapor of the gasoline, thence through the conducting pipe or main E, which connects with the usual or any suitable burner by branch pipes or connections.

Motion is imparted to the moving parts of the pump A by means of a drum, F, actuated by a cord or wire rope, G, having a weight attached to its free end, the object of thus weighting the cord being to cause the automatic and gradual unwinding of said rope from the drum and the consequent gradual revolution of the drum F. The cord or rope G passes over a pulley, I, which is mounted in a bracket or support, A', suspended from or attached to any suitable part of the building or room in which the apparatus is located. Upon the shaft J of the drum F—that is to say, of the pump A—is a sprocket-wheel, K, which is connected by a chain belt to a series of sprocket-wheels of unequal circumference arranged conically upon the shaft of the mixer O, which may be of the same construction as the pump A, but of smaller size, and to which an inlet or air-induction pipe conveys the air from the outer atmosphere.

The pump A and the gas-machine itself being put in operation in the usual manner, the movement of the drum F, which actuates the moving parts of the pump A, which actuates in like manner the moving parts of the smaller pump O, thereby causing the smaller pump O to draw in atmospheric air through the air-induction pipe, and expel through the pipe Q into the connecting pipe or main E simultaneously with the flow through the latter of the carbureted air, whereupon the air from the pump O reduces the relative proportion of the hydrocarbon in the carbureted air to the degree requisite in a rich but clear burn-

ing gas, the proportion of air thus admitted to the pipe E being controlled by the pump A in proportion to the amount of gas being used. It matters not whether there is one burner being used or ten, or the full capacity of the machine, the proportion of air and gas will always be the same. There are no valves to get out of order, or any other complicated contrivance. The operation of the pump O depends altogether on the pump A to operate it. The pump A will not move unless there is gas being used. When the proportion of hydrocarbon in the gas or carbureted air in the generator reaches or falls below the proportion required for a rich and clear burning gas, the speed of the pump O can be instantly reduced by an adjustable arrangement.

The sprocket-wheels L on the shaft N of the pump O are arranged in different sizes, so that they can be connected to the chain belt M, which is controlled by the pump A, so that the pump O can be made to revolve six revolutions to one of the pump A, or in any proportion that is necessary to produce the required results at the burner. The gas thus made is delivered to all parts of the premises alike, every burner or gas-light being controlled at one place--namely, at the mixer.

In the arrangement shown in the drawings, the ropes or chains are first coiled upon the drums upon the shafts of the respective pumps by turning the hand-crank. (Shown in Fig. 1.) When the ropes are thus coiled upon their respective drums, said drums may be held from further movement by means of a pawl and ratchet or other well-known means. To each rope, at the end opposite to that attached to the drums, is attached a weight which has a constant tendency to draw down the ropes and unwind them from and thus rotate the drums and the shafts of the respective pumps. Direct connection between the shafts of the respective pumps is secured by means of the chain belt M, which gears with the sprocket-wheel K on the shaft of the pump A, and with an idler or idlers, S, having loose bearing in a slotted arc, S', and with the sprocket-wheels L on the shaft N of the supplemental pump O. The speed at which the shaft N of the pump O revolves relatively to the speed of the shaft J of the pump A can be readily regulated by shifting the conically-arranged cluster of sprocket-wheels L either forwardly or rearwardly along the shaft N, so as to bring either one or the other into engagement with the belt. By constructing these sprocket-wheels of dif-

ferent diameters different degrees of rotation can readily be imparted to the shaft N of the secondary or supplemental air or gas forcing apparatus O, depending upon which wheel is placed in engagement with the belt M. This regulation of speed can be readily effected at any time during the operation of the apparatus, as the cluster of wheels L is held upon the shaft N by friction, and can be readily slid back or forward, as desired. When the position of the belt M is changed from one to another sprocket-wheel L, the idler or idlers S are slid along within the slotted arc S', by which means the belt is either slackened or tightened, so as to secure the requisite amount of tension thereon.

Having thus described my invention, I claim--

1. In an air-and-gas-mixing machine, the combination, with an air-pump and an auxiliary air-pump, each having outwardly-projecting shafts, provided with means for rotating the same in one direction, and automatically rotating the same in a reverse direction, of a series of sprocket-wheels of unequal diameter mounted upon the shaft of one of said pumps, a belt adapted to connect said sprocket-wheels and the shaft of the other pump, and an idler and slotted arc for the purpose of adjusting the belt to the several sprocket-wheels and regulating its tension, substantially as and for the purpose set forth.

2. The combination, in an air-and-gas-mixing machine, of an air-pump, A, having a shaft, J, extending outwardly therefrom, drum, F, mounted upon said shaft, supplemental air pump or mixer O, having an outwardly-extending shaft provided with a drum, ropes, or chains connected at one end with said drums, and supported upon suitable pulleys, and having at their opposite ends weights to secure the uncoiling of said ropes from the drums, a series of conically-arranged sprocket-wheels mounted upon the shaft of one pump, a belt connecting said sprocket-wheels with the shaft of the other pump, and means, substantially as described, for shifting said belt from one sprocket-wheel to another and securing it in position, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES P. CLIFFORD.

Witnesses:

JAMES D. KING,
C. J. EMMONS.