

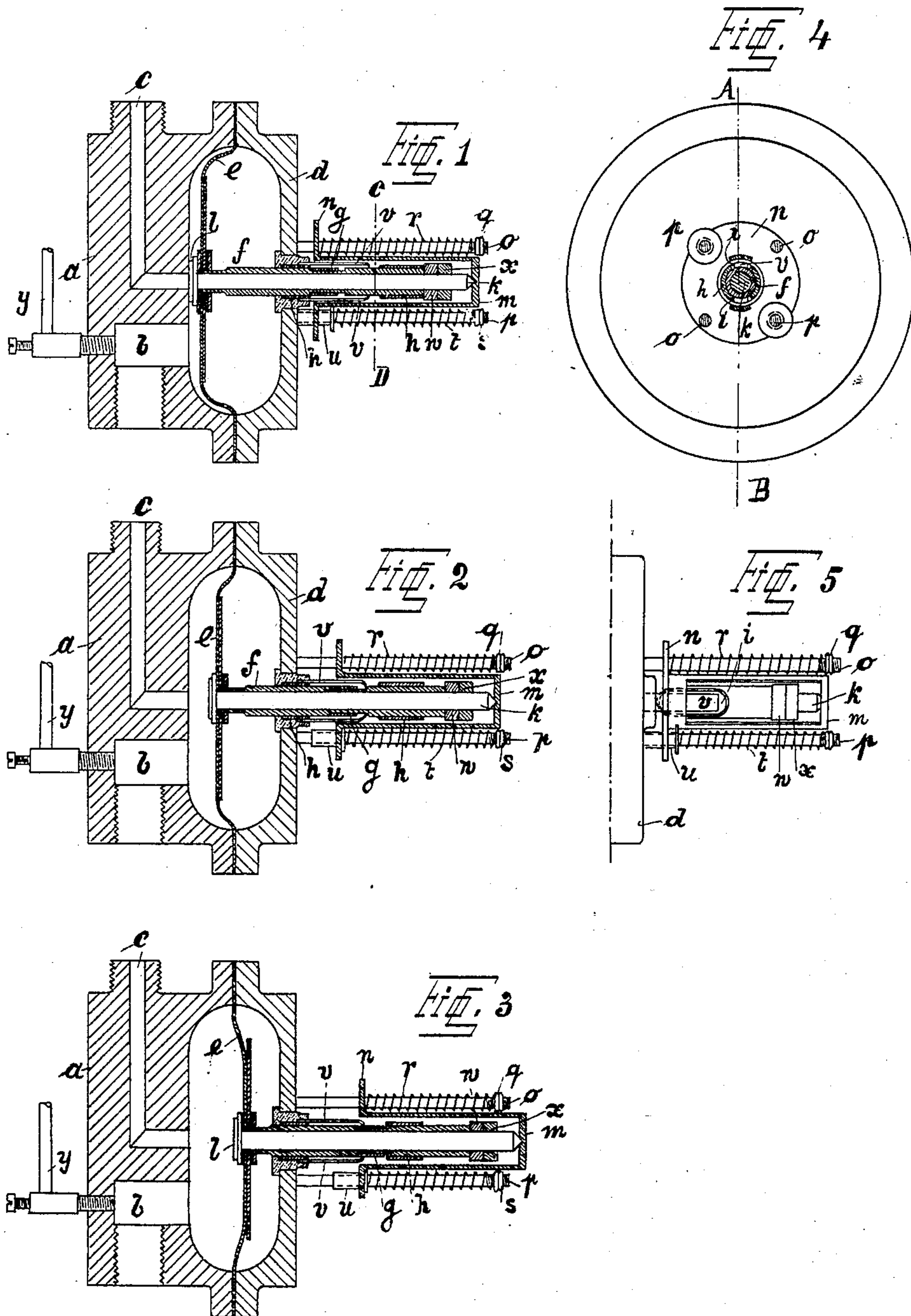
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DISTANCE OPERATED GAS IGNITER.

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NO MODEL.



Witnesses  
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## UNITED STATES PATENT OFFICE.

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## DISTANCE-OPERATED GAS-IGNITER.

SPECIFICATION forming part of Letters Patent No. 773,696, dated November 1, 1904.

Application filed November 9, 1903. Serial No. 180,420. (No model.)

*To all whom it may concern:*

Be it known that I, GUSTAV WEINMANN, a citizen of the Republic of Switzerland, residing at Zurich, Switzerland, have invented certain new and useful Improvements in Distance-Operated Gas-Igniters, of which the following is a specification.

This invention relates to improvements in distance-operated gas-igniters.

Gas-igniters adapted to be operated from a distance by altering the pressure of the gas, so as to ignite and extinguish the flame, have the disadvantage that the gas-pressure in the pipe system or mains must be maintained at a uniform strength during the entire period of lighting, since otherwise the cut-off mechanism of the burners moves with the fluctuations of pressure, so that undesirable interruptions occur. The invention hereinafter described, and illustrated in the annexed drawings, removes these disadvantages by causing the cut-off mechanism to remain in its open position after being opened until a brief increase of pressure of definite amount intentionally produced in the pipe system causes it to return to its closing position and extinguish the light.

One form of the invention is illustrated in the annexed drawings, in which—

Figures 1 to 3 are sections on the line A B of Fig. 4, showing the mechanism in different positions. Fig. 4 is a section on the line C D of Fig. 1 seen from the right, and Fig. 5 is a partial plan view.

*a* is the support of the igniter, provided with two gas-ducts *b* and *c*. One side of the said support is concave and provided with a convex cover *d*, so as to provide a chamber into which the ducts *b* and *c* open and by means of which cover the edge of a membrane *e* is pressed against the support. Fixedly connected to the said membrane is a tube *f*, which is provided, preferably at approximately the middle of its length, with an annular recess, so as to form a throat of smaller external diameter of given length, on which slides a small sleeve *g* of shorter length than the throat, the outer diameter of which sleeve is flush with that of the tube *f*. The latter is guided in a bearing *h*, fixed to the cover *d*. In the tube *f* a pointed

valve-rod *k*, carrying a valve *l*, is movable. The pointed end of the rod *k* engages a recess in a stirrup *m*, the rotation of which is prevented by rods *o p*, which extend through holes in its annular foot *n* and are fixed to the cover *d*. Springs *r*, mounted on the rods *o* and abutting against screw-collars *q* on the latter, bear against the foot *n*, so as to press the stirrup *m* against the end of valve-rod *k*, and springs *t*, mounted on the rods *p*, bear against screw-collars *s* on the latter and against flanged sleeves *u*, slidably mounted on the rods *p* and adapted to have bearing with their flanges on the outer face of foot *n*. The said sleeves *u* are movable in apertures in the foot *n* and abut against the cover *d* when the igniter is at rest, Fig. 1, so that the springs *t* then exert no pressure on the stirrup *m*.

Fixed in slots *i* of the bearing *h* in the cover *d* are two elastic catches *v*, the free ends of which rest with light pressure on the surface of the outer part of the tube *f* when the mechanism is in the position shown in Fig. 1. Beyond the tube *f* a rubber ring *w* and a stop *x* are fixed to the valve-rod *k*.

When the pressure in the mains is low—that is to say, during the day-time—the valve *l* abuts against its seat and the catches *v* rest on the outer part of the tube *f*, Fig. 1. To ignite a number of burners connected to a pipe system, the gas-pressure in the said system is temporarily increased in the known manner to slightly above the normal working pressure. When this wave of pressure occurs, the membrane *e* and tube *f* are forced outwardly toward the right, Fig. 2, so that the valve is lifted from its seat and gas flows from the pipe or duct *b* to the duct *c*, and thus to the burner, where it is ignited by the flame of a by-pass burner fed by the tube *y* or by other suitable means. During this outward movement of the tube *f* the catches *v* slide on its surface until they engage into the recessed part of the tube. The outward movement of the membrane and opening of the valve do not take place until the gas-pressure against the membrane is sufficient to overcome the pressure of the springs *r*, so that the igniter can be regulated to act at certain gas-pressure by adjusting the screw-threaded



collars *g* to give the required pressure to the said springs *r*. If a number of burners are connected to the pipe system at different points, the igniting mechanism of each burner can be adjusted according to the pressure normally existing at the respective point, so that it is only operated when the increase of pressure exceeds a certain minimum. By adjusting the various igniting devices to be operated by pressure increases of different values it is therefore rendered possible to ignite single burners or groups of burners by means of waves of pressure of corresponding value. When the increase of pressure has operated all the igniters on which it is intended to act, the pressure in the pipe system is altered to the normal or after pressure—that is to say, slightly reduced. This reduction of pressure results in a rearward movement of the rod *k* and tube *f* under the action of the springs *r*, but the catches *v*, which engage the shoulder at the end of the recessed part of the tube *f*, prevent the complete return of the latter and the closing of the valve and hold the tube *f*, and consequently the valve *l*, at such position that fluctuations, more especially reductions in the normal gas-pressure, do not affect the valve. To extinguish the burners, an increase of pressure is again produced in the pipe systems, this increase being of such value that the pressure is greater than that used for igniting the burners. By this means the membrane *e* is moved outward farther than before, overcoming the pressure of the springs *r*, as well as of the springs *t*, and pushes the sleeve *g* underneath the catches *v*, the latter being by this means lifted out of the recess in the tube *f*. When this increase of pressure has acted on all the igniters, the pressure in the pipe system is reduced to below the normal working pressure, so that the membrane *e* and the valve *l* move back under the action of the springs *r* and *t*. During this return movement the sleeve *g* is held fast by the catches *v* until its outer end abuts against the tube *f*, whereupon the said sleeve moves with the latter and the catches slide off the sleeve *g* onto the outer part of the tube. The valve *l* and membrane can thereupon return to the position shown in Fig. 1.

It will be seen that the extinguishing or, more properly speaking, the release of the catches *v* for the purposes of permitting of extinguishing the burner when the pressure is altered depends on the pressure of the springs *t*, so that by adjusting the latter by means of the screw-collars *s* the mechanism can be regulated so that the burner cannot be extinguished until after a certain gas-pressure has been previously reached. This gas-pressure for extinguishing the burner is independent from that by means of which the burners are ignited. By regulating the igniters connected to one system in such a manner that they will be operated by different “extinguishing” pressures it is therefore pos-

sible to extinguish different burners or groups of burners at different times. Burners which are simultaneously ignited can be extinguished at different times, and burners ignited at different times can be simultaneously extinguished. The mechanism can also be so arranged that the valve-rod is vertical, and in that case the springs *r* and *t* can be replaced by weights which are so calculated that each one separately balances a definite fraction of the gas-pressures acting on the valve. Assuming that the pressure conditions in that part of the pipe system to which the burner is connected are known, the mechanism can easily be adjusted to be operated by given “igniting” and “extinguishing” pressures. To allow of igniting and extinguishing single burners independently from the others and without the coöperation of the gas-works or pressure-controlling station, it is only necessary to connect a small pressure-pump to the pipe leading to the nozzle *b* or to a special pipe leading to the space in which the membrane moves. By means of this pump certain increases of pressure of different value can be produced in order to operate the mechanism in the manner desired.

I claim—

1. In gas-igniters of the character described, the combination with a pressure-chamber having an inlet and outlet for gas, of a valve for said outlet, a membrane in said chamber in connection with said valve adapted to be deflected by a predetermined gas-pressure in said chamber to open said valve, a lock located for automatically engaging said valve in opened position and means operated from said membrane to disengage said lock upon the further deflection of the membrane due to attainment of a predetermined higher pressure in said chamber said disengaging means being adapted to hold the lock disengaged during subsequent closing movement of the valve.

2. In gas-igniters of the character described, the combination with a pressure-chamber having an inlet and outlet for gas, of a valve for said outlet, means adapted to be operated by a predetermined gas-pressure in said chamber to open said valve, a lock for automatically engaging the stem of said valve in opened position and a slidable sleeve on said valve-stem operating to disengage said lock upon the attainment of a predetermined higher pressure in said chamber and holding same disengaged during subsequent closing movement of the valve.

3. In gas-igniters of the character described, the combination with a pressure-chamber having an inlet and outlet for gas, of a valve for said outlet, a lock for automatically engaging said valve in opened position, means adapted to be displaced in proportion to increasing gas-pressure in said chamber first, to open said valve, and subsequently to move a disengag-



ing device for said lock upon the attainment of a predetermined higher pressure in said chamber, said disengaging device being adapted to hold the lock disengaged during subsequent closing movement of the valve.

5 4. In gas-igniters of the character described, the combination with a pressure-chamber having an inlet and outlet for gas, of a valve for said outlet, a lock for automatically engaging  
10 said valve in opened position, means adapted to be displaced in proportion to increasing gas-pressure in said chamber first to open said valve, and subsequently to move a disengag-  
15 ing device for said lock upon the attainment of a predetermined higher pressure in said

chamber, said disengaging device being adapted to hold the lock disengaged during subsequent closing movement of the valve, together with severally-adjustable counter-pressure devices for said displaceable means adapted 20 to operate to give different effective counter-pressure during said first and subsequent movements respectively.

In witness whereof I have signed this specification in the presence of two witnesses.

GUSTAV WEINMANN.

Witnesses:

WM. A. WEINMANN,  
A. AMMEN.