

L. KASSANDER.

INJECTOR.

APPLICATION FILED JAN. 6, 1913.

1,057,740.

Patented Apr. 1, 1913.

2 SHEETS—SHEET 1.

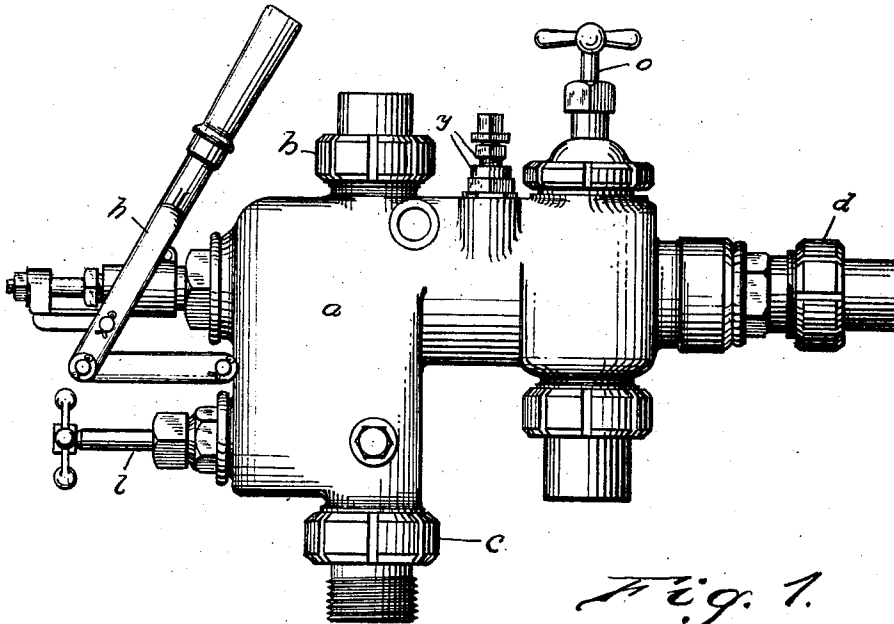


Fig. 1.

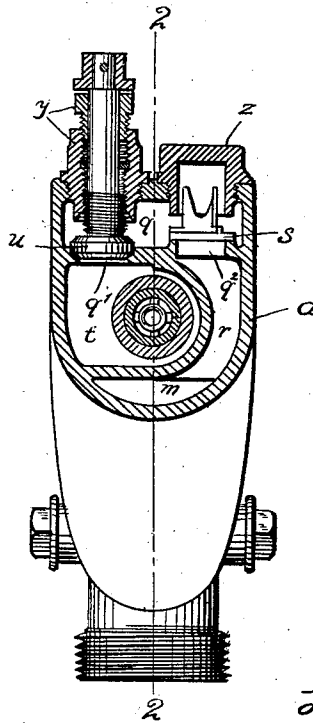


Fig. 3.

Witnesses

J. Milton Jester
H. B. Marston

334

Inventor

Leopold Kassander
Manuel J. Riley
Attorney

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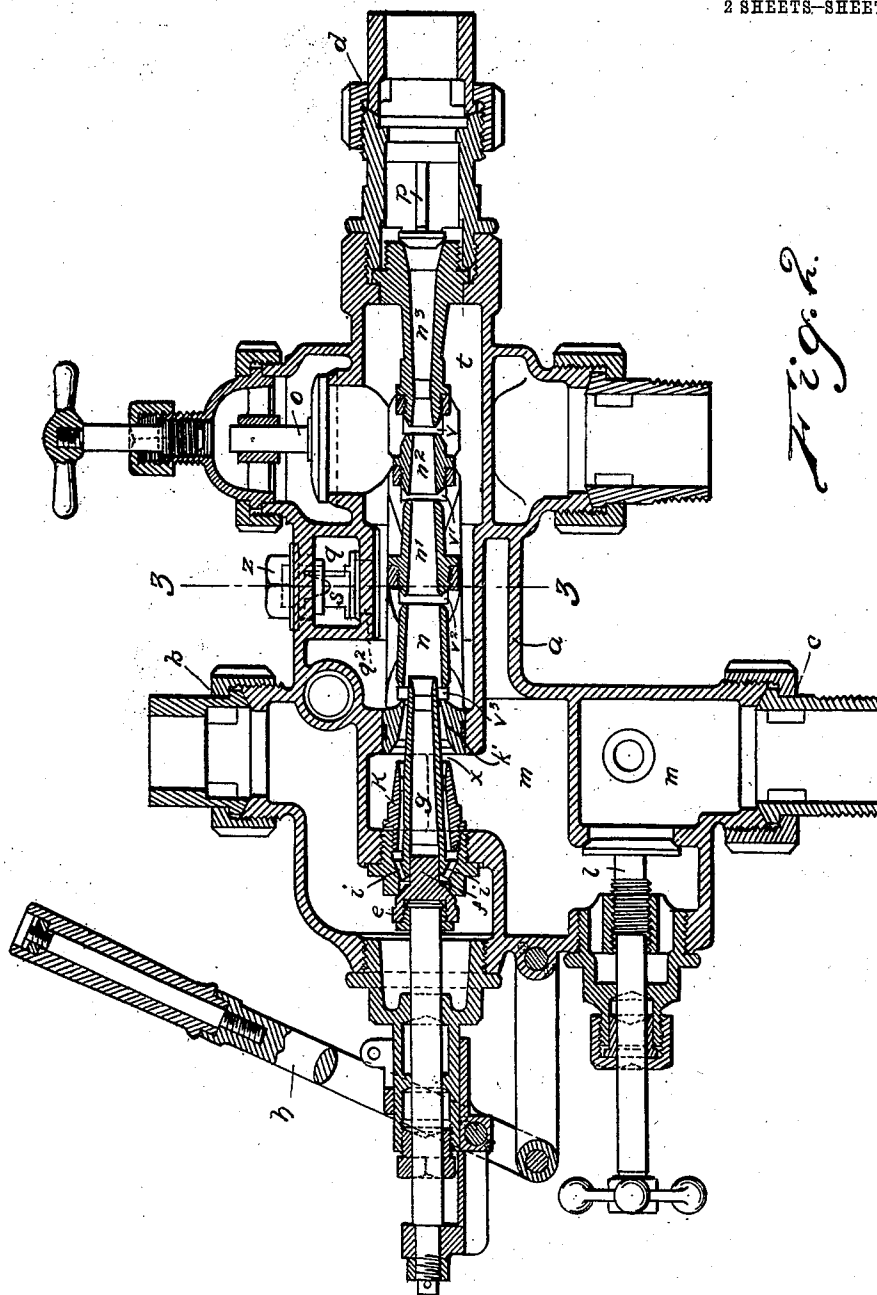


Fig. 2.

Inventor

Witnesses

J. Milton Jester.
H. B. Moreton.

By

Leopold Kassander
MacArthur Sailer
his Attorney

UNITED STATES PATENT OFFICE.

LEOPOLD KASSANDER, OF NEW YORK, N. Y., ASSIGNOR TO NATHAN MANUFACTURING COMPANY, OF NEW YORK, N. Y.

INJECTOR.

1,057,740.

Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed January 6, 1913. Serial No. 740,433.

To all whom it may concern:

Be it known that I, LEOPOLD KASSANDER, of the city, county, and State of New York, have invented a new and useful Improvement in Injectors, of which the following is a specification.

My invention relates to that form of injector in which, in addition to the main water supply inlet to the nozzles, there is an auxiliary water inlet through which water from the main water supply passage may pass directly into the overflow chamber, this auxiliary water inlet being controlled by a gravity check valve, and the auxiliary water supply through said inlet to the overflow chamber being drawn, under certain conditions, into the nozzle through the overflow openings beneath the latter, with the result of increasing the delivering capacity of the injector. This gravity check valve for controlling direct communication between the main water supply passage and the overflow chamber, may, and not infrequently does, get out of order and becomes leaky; and when this happens, the prompt starting of the injector is interfered with. In order to prevent this occurrence, there has been employed, in addition to the gravity check valve, a hand-operated cut-out valve (sometimes called an emergency valve), which, in case the gravity check valve should leak, may be used to positively close the auxiliary water inlet, thus permitting the injector to be continued in action, although with a somewhat reduced delivering capacity, until there is opportunity to repair the leaky gravity check valve.

In any form of the joint use of the gravity check valve and the hand-operated cut-out valve, so far as known to me, either the check valve is not readily accessible for repairs and necessitates the removal of other parts of the injector in order to get at it, or it interferes with the position and adjustment of the main water regulating valve. In other words, the two valves—the gravity check valve and the hand-operated cut-out valve—are not entirely separate from, and independent of, each other in the sense that either one of them is readily accessible for inspection and repairs independently of the other, and without disturbing any other parts of the injector.

It is the object of my invention to remedy this defect, and to so construct the two valves and locate and arrange them relatively to each other and to the body of the injector, that either of them will be readily and conveniently accessible from the outside, independently of, and without reference to, the other.

A form of injector embodying this desirable improvement is shown in the accompanying drawings, to which I shall now refer for a better understanding of my invention.

In the drawings—Figure 1 is a side elevation of the injector; Fig. 2 is a longitudinal sectional view, on an enlarged scale, of the injector on line 2—2, Fig. 3. Fig. 3 is a cross sectional view, on a somewhat smaller scale, on line 3—3, Fig. 2.

a is the body of the injector to which are attached at *b*, *c*, and *d*, the pipe connections for connecting with the steam supply, the water supply and the boiler, respectively. *e* is the steam valve having, on its front end, a round stem *f*, which enters the rear end of the steam nozzle *g*, said valve being operated by means of a lever *h*. Steam nozzle *g* has a number of small holes *i* drilled through its base, which connect with the interior of the lifting steam nozzle *h*. *l* is the water regulating valve and *m* is the main water supply passage in the injector. *n*, *n'*, *n²*, *n³*, are the usual nozzles with overflow openings *v*, *v'*, *v²*, *v³*, between them. *t* is the overflow chamber; *o* the overflow valve, and *p* the back pressure valve. All of these are the usual and ordinary parts of an injector.

I pass now to those parts of the injector which are more immediately concerned in my improvement. In the body of the injector is formed a chamber *q*, which is located above the overflow chamber *t*, and extends crosswise of the injector body. In the floor of this chamber are formed two ports *q'*, *q²*, opening, the former into the overflow chamber *t*, and the latter into a semi-circular cored channel or passage *r* extending outside and partly around the overflow chamber and leading into the main water supply passage *m*. The port *q²* is controlled by the gravity check valve *s*, and the port *q'* by the hand-operated cut-out valve *u*. In the top of the

transverse chamber q are formed two openings, vertically above the ports q' , q'' , respectively in the bottom of said chamber. One of the openings is closed by a bonnet and nut y , through which passes the stem of the cut-out valve u ; the other is closed by a screw cap z , which serves as a guide for the gravity check s . The cut-out valve u normally is in open position. It is closed only in case of emergency—in which position it is shown in Fig. 3.

In starting the injector, the steam valve e is pulled out just sufficiently to admit steam into the small openings i , without withdrawing the stem f on the end of the steam valve from the interior of the steam nozzle g . The steam then passes through the openings i into and through the lifting steam nozzle k and lifting combining tube k' , through the overflow opening v into the overflow chamber t , and, lifting the overflow valve o , passes thence out into the atmosphere, creating a vacuum in the injector and drawing the water from the water tank.

It will be seen from inspection of the drawing that the main water supply enters the nozzles at x in the usual manner, and that whatever water passes through the channel r , and chamber q , past the valves s and u into the overflow chamber, is in addition to the main water supply. Should the check valve s leak, or be held off its seat by some obstruction, then the steam admitted to start the injector as just described, would pass from the overflow chamber up through the open port q' (the emergency valve u being normally open, as above stated), to chamber q , and thence through the leak in check valve s down through the auxiliary water supply channel r into the main water supply passage m , thus preventing the injector from starting. In such case an emergency valve u is at once closed, thus shutting off connection between the overflow chamber and the chamber q above, and consequently preventing the steam from exerting back pressure in the main water supply passage.

It is important to have the gravity check s so located that it is readily accessible and conveniently got at from the outside, without disturbing any part of the injector, as well as to have the hand-operated emergency or cut-out valve u similarly located, and of the simplest possible form, so that its operation, and the effect of its open and closed position, will not require lengthy explanations, or particular knowledge or experience on the part of the operator. It is for this purpose that I locate the two valves in a transverse chamber in the top of the injector body, with ports in its bottom communicating with the overflow chamber and

auxiliary water supply channel r respectively, with the two valves s , u , located side by side in this chamber crosswise of the injector; and it is with the same end in view, that I make the emergency valve u in the form of a plain screw spindle valve with its spindle passing up through the bonnet and nut y , and screw-threaded to engage the bonnet, to be screwed up or down by turning the valve spindle in the same manner as an ordinary screw valve, the nature of which everyone connected with steam appliances knows. It is preferred to provide the spindle at its outer end with a squared end, as seen in Fig. 2, to permit the application of the handle to be used in operating it.

To get at the cut-out valve u or the port q' controlled by it, all that is needed is to unscrew the bonnet y , which carries with it the screw spindle valve u , and leaves uncovered the opening in the top of chamber q through which the port q' can be reached. To get at the gravity check s , all that is needed is to unscrew and remove the cap z , as will be obvious without further explanation. The arrangement of these parts crosswise of the injector body takes up but little room, and permits them all to be located in the top of the injector body in the space thereon which intervenes between the steam supply coupling and the overflow valve cap, as indicated in Fig. 1. The two valves are entirely separate and independent of each other, and are accessible for inspection and repairs independently of each other, and independently of any other part of the injector.

Having described my improvement, what I claim herein as new and desire to secure by Letters Patent, is as follows:

In an injector, and in combination with the water and steam supply connections, main water supply passage, overflow chamber and nozzles therein, a chamber formed in, and crosswise of, the body of the injector, and located above the overflow chamber therein, and having two ports in its floor or bottom, opening, the one into the top of the overflow chamber; the other into an auxiliary water supply channel communicating with and leading from the main water supply passage; two valves located in said transverse chamber, the one a gravity check valve controlling the port opening into the auxiliary water supply channel, the other a hand-operated cut-out screw valve, controlling the port opening into the overflow chamber; two openings formed in the top of said transverse valve containing chamber, one vertically above each of the ports in the bottom of said chamber; a removable cap closing the opening above the port controlled by the gravity check valve;

and a removable bonnet closing the opening
above the port controlled by the manually-
operated cut-out valve, the operating screw
stem or spindle of said cut-out valve passing
5 up through and engaging said bonnet, all
substantially as hereinbefore shown and set
forth.

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

LEOPOLD KASSANDER.

Witnesses:

NICHOLAS W. ANTHONY,
GEORGE E. HANNAH.