(No Model.)

E. H. THOMPSON.

INJECTOR OIL BURNER.

No. 430,549. Patented June 17, 1890.

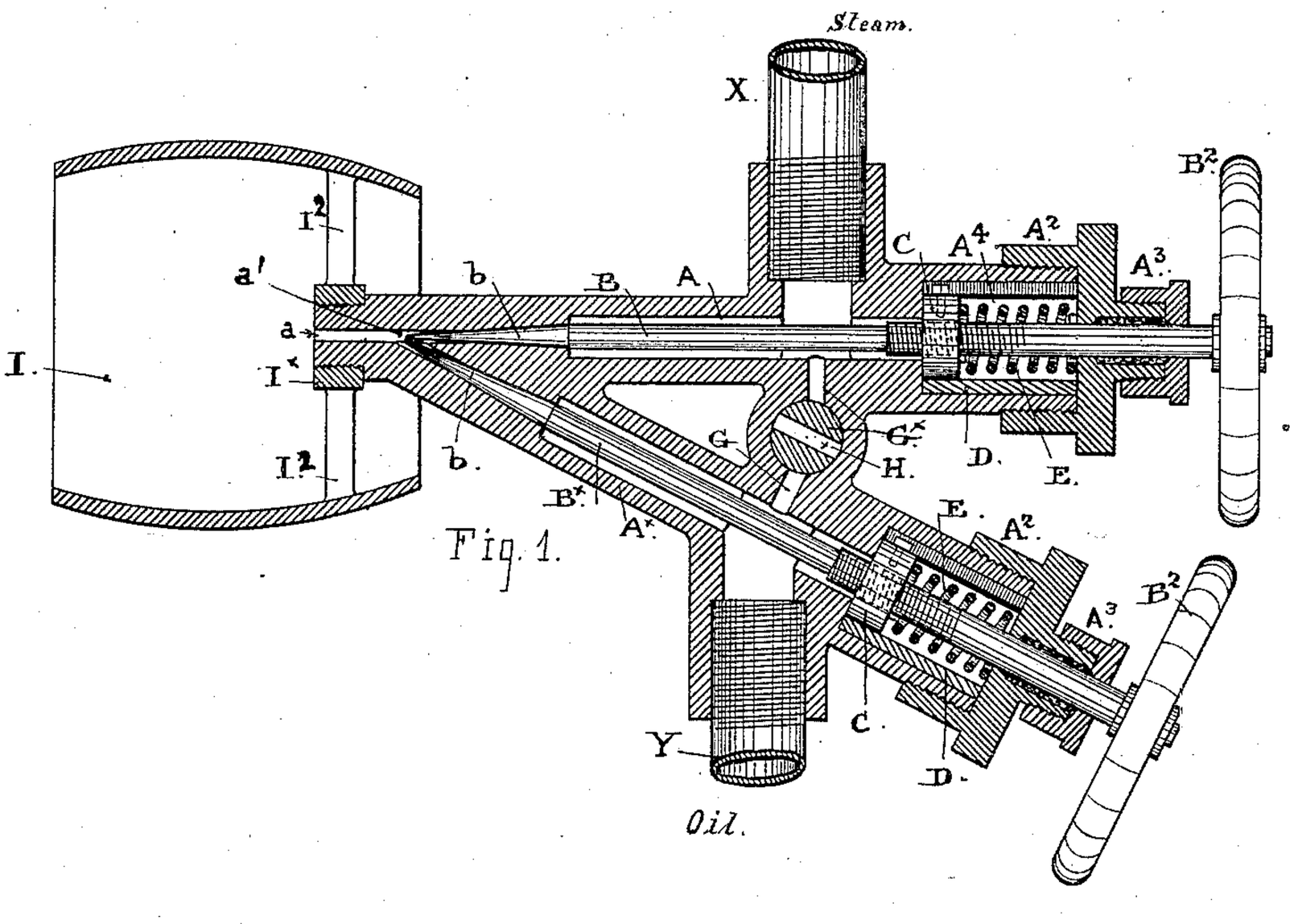

Fig. 1.

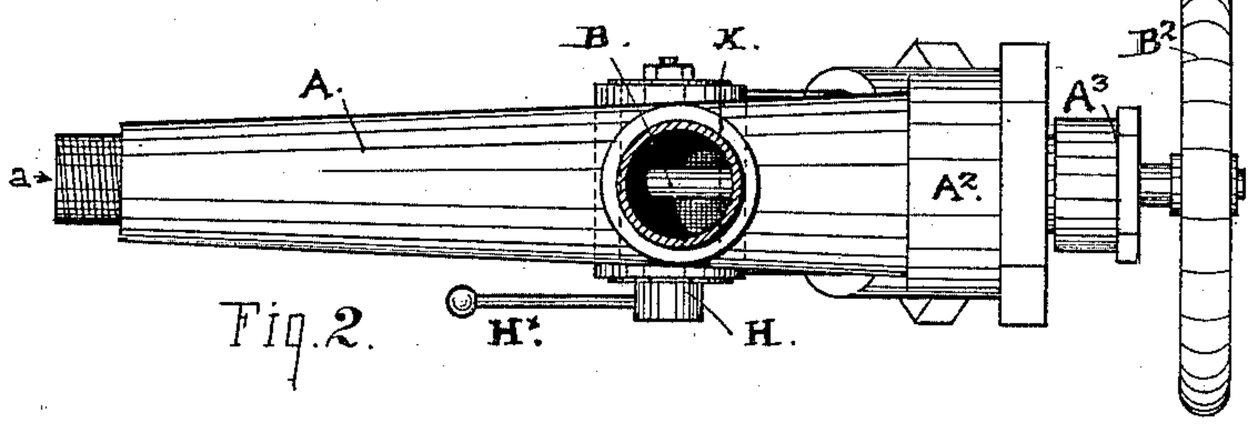

Fig. 2.

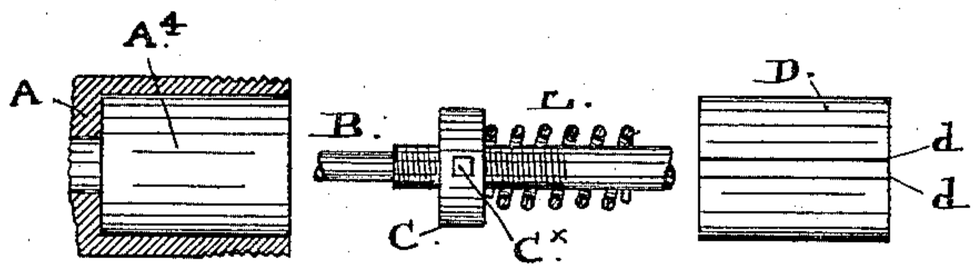

Fig. 3.

Witnesses:

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UNITED STATES PATENT OFFICE.

ELIAS H. THOMPSON, OF NEWARK, CALIFORNIA.

INJECTOR OIL-BURNER.

SPECIFICATION forming part of Letters Patent No. 430,549, dated June 17, 1890.

Application filed April 19, 1889. Serial No. 307,862. (No model.)

To all whom it may concern:

Be it known that I, ELIAS H. THOMPSON, a citizen of the United States, residing at Newark, in the county of Alameda and State of California, have invented certain new and useful Improvements in Injector Oil-Burners, of which the following is a specification.

My invention relates to improvements in devices for burning crude petroleum in mixture with and under pressure of steam in furnaces, and more particularly to burners of the kind known as "injector-burners," in which the oil is drawn through and expelled with force from a nozzle by the action of a jet of steam operating after the manner of an injector.

The object sought to be attained by the present invention is to enable the full force or pressure of steam to be applied through the passages and apertures of the burner from time to time while the burner is at work, for the purpose of blowing out such obstructions in the form of dirt or other solid particles as are frequently carried into the burner with the oil or steam, whereby the passages and apertures are kept clean and free and thorough combustion is secured.

To such end and object my invention consists in certain novel construction and combination of parts, and the production of an improved burner in which the passages and apertures can be thrown open to their full area and the steam-pressure directed through them from time to time as often as required during the operation of the burner without disturbing the adjustment of the valves, all as hereinafter fully set forth.

The accompanying drawings, forming part of this specification and referred to by letters, illustrate, in Figure 1, a side view of my improved burner with the body in section. Fig. 2 is a top view of the burner. Fig. 3 shows parts in detail.

The body of this burner is formed with the passages A $A^{\times}$ arranged at an acute angle and coming together at a point a' behind the aperture a, where the oil from one and the steam from the other passage are brought together. To each of these passages there is provided a screw-threaded socket or coupling for connecting the burner to the pipe that leads from the oil-tank in the one case and from the steam-space of the boiler in the other case, and in each passage is a needle-valve extending from the rear end to the forward part of the burner-body, where the form of the passage has a regular taper and is generally reduced in size until it meets the other passage. The spindles of the valve are screw-threaded, and fit corresponding threaded sockets in the body near the rear end, so that longitudinal movement of the valves is produced by rotating them, suitable hand-wheels being provided on the outer ends of the spindles for such purpose. In their general construction and arrangement these parts are the same as are found in injector-burners at the present time. The pipe X connects the passage A with the steam-supply and the opposite one Y connects the passage $A^{\times}$ with the oil-tank. The valve-spindles B B terminate in needle-valves b, and at the rear end extend through the screw-caps A^2 and their glands A^3 of the burner-body, where a hand-wheel B^2 is fixed on the end of each spindle.

In the present improvement I make the socket for the screw-threaded portion of the valve-spindle a separate nut or collar C, setting in the bore or passage A^4 of the body from the rear end, which is enlarged for the purpose, and is made sufficiently larger in diameter to take in a split sleeve D around the nut. This sleeve is the full length of the chamber or enlarged portion of the passage, and is applied for the purpose of preventing rotation of the nut, which is fitted to slide freely in it, the slit formed by the edges d d of the sleeve being arranged to take in a stud or stop-pin C* on the nut. By this construction the needle-valve can be drawn back from the taper passage a distance equal to the space provided behind the nut by pulling back its spindle, and thus as often as the hand-wheel is pulled back it will have the effect to throw the passage full open, while the nut is prevented by the pin and guide-slot from turning on the spindle. A coil-spring E around the spindle is placed behind the nut to press it forward, so that it is kept against its seat at the front end of the chamber and is held stationary at all times, except when sufficient pulling force is applied to the rear end of the spindle to draw it out. It will be seen, therefore, that a needle-valve to which this im-

provement is applied can be thrown back from its position and the passage opened to its full area at any time without affecting the adjustment, because the sliding nut that regulates the position of the spindle always moves with it and is returned to place without being affected by the longitudinal movement.

The construction is the same in both valves; but to apply the steam-pressure through the oil-feeding passage I connect the two passages A and $A^{\times}$ by a cross-passage G, in which a rotary plug-valve $G^{\times}$ is provided for cutting off the connection between the two passages. The manner of forming and arranging this connection is clearly shown in Figs. 1 and 2 of the drawings. The valve is an ordinary key or rotary plug, and is furnished with a lever H at one side for turning it. Through this connection-passage the steam can be turned as often as required, and the full pressure being directed into it will act to blow out the oil-passage without disturbing the adjustment of the burner or material by interfering with its operation. In addition to these improvements I have so changed the form of the drip-cup or device to catch waste oil dropping from the nozzle of the burner that will act to retain the drippings and hold them for combustion instead of allowing them to drop on the floor beneath and go to waste.

In many burners of this kind at the present time there is considerable waste of unconsumed oil at the nozzle, and the ground or floor immediately under the burner often becomes saturated with the drippings, as the form or style of drip-cup heretofore applied is not designed to retain the waste. This part of the burner I make of cylindrical shape, but with a swell or bulge in the middle, so that the edges at the ends are higher than the center, as shown in the section, Fig. 1, and the interior surface is concave along any longitudinal line. In the center of this cup I, but nearer one than the other, is a screw-threaded hub $I^{\times}$, fitting the corresponding threaded end of the nozzle and supported by the radial arms I^{2}, which serve to hold the cup in position around the delivery end of the burner, and with the deepest portion of the receptacle setting beyond the discharge aperture. Such quantity of oil as would otherwise go to waste will thus be caught in the cup, and being held in proximity to the flame it will not escape combustion.

Where the oil and steam feeding passages are kept properly free and unclogged, however, the drip-cup will in most cases be found unnecessary, as complete combustion of the fuel can be secured by suitable adjustment of the supply and the proportions of the oil and steam.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with the body A, having a bore or passage and a needle-valve applied to regulate the area of said passage, of the enlarged chamber A^{4}, having a sleeve D, which is provided with a longitudinal slit, a movable nut C, having a stud C^{*}, working in the sleeve, and the spring E, applied around the valve-stem and operating against the nut, as set forth.

2. In combination with an injector-burner, a cylindrical drip-cup I, having a barrel-shaped body, as described, and a central hub $I^{\times}$, by which to secure it to the nozzle of the burner, said hub being supported on spiders I^{2}, secured a little distance inward from the end of the barrel, whereby the enlarged circumference of the barrel is brought under the nozzle, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

ELIAS H. THOMPSON. [L. S.]

Witnesses:
CHAS. E. KELLY,
EDWARD E. OSBORN.