

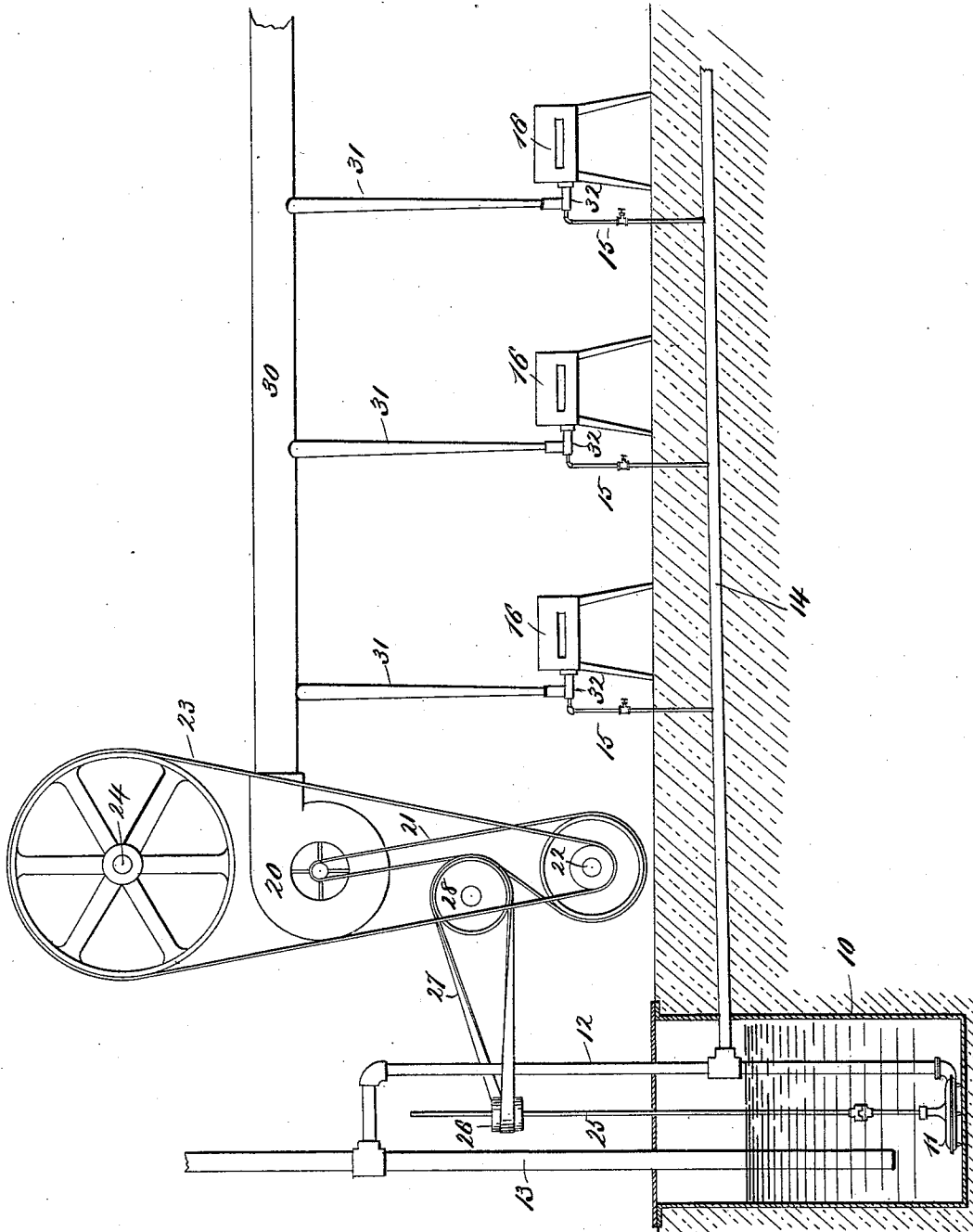
(No Model.)

E. ROGERS.

APPARATUS FOR BURNING HYDROCARBON OILS.

No. 428,353.

Patented May 20, 1890.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

ETHAN ROGERS, OF BALLSTON, NEW YORK.

## APPARATUS FOR BURNING HYDROCARBON OILS.

SPECIFICATION forming part of Letters Patent No. 428,353, dated May 20, 1890.

Application filed July 13, 1889. Serial No. 317,449. (No model.)

*To all whom it may concern:*

Be it known that I, ETHAN ROGERS, of Ballston, in the county of Saratoga and State of New York, have invented a new and Improved  
5 Apparatus for Burning Hydrocarbon Oils, of which the following is a full, clear, and exact description.

Two systems are employed in the burning of crude oil in forges when air is used as an  
10 atomizer, one system being to compress the air and use it under comparatively heavy pressure and the other system being to employ a fan-blast of comparatively light pressure. In the first system the oil is forced  
15 through the burner by the compressed air, and cannot possibly get to the fire without a supply of air to vaporize it, and consequently a supply of air to carry on sufficient combustion to consume the vaporized oil; but this  
20 method of burning oil is expensive, in that a costly plant is required to compress the air, and, on the other hand, when a fan-blast has been employed there is great danger of explosion and fire, as the oil is taken to the  
25 burner either by gravity or by pumping, the pump acting independently of the fan, so that if the blast is shut off for any reason the pump may continue to act, and oil will thus  
30 be delivered to the burner without the required quantity of air to carry on combustion.

The object of my invention is to overcome the difficulties heretofore experienced in burning oil by means of a blast; and to the ends named the invention consists, essentially, of  
35 a system or arrangement by means of which the pump employed to raise the oil so that it will flow to the burners is driven by the belt employed to drive the fan, and consequently the fan must operate at all times when the  
40 pump is operated. In this way I insure the delivery of the required amount of air to the burner at all times when the pump is in operation.

Reference is to be had to the accompanying drawing, which is a diagrammatical view of my improved system of burning oil.

In the drawing, 10 represents an oil-tank of a capacity such that it will hold one day's supply of oil. Within this tank I mount a  
50 centrifugal pump 11, which delivers to a stand-pipe 12, that leads to a return-pipe 13, of larger diameter than the stand-pipe, the return-pipe

13 extending upward through the roof of the building and to the open atmosphere. From the stand-pipe 12, I lead the main delivery-  
55 pipe 14, from which there are branch pipes 15, that lead to the forges 16, the pipe 14 being upon an incline, such that when the pump ceases to act all oil contained within the pipe 14 and within the pipes 15 will flow back to  
60 the stand-pipe, and thus into the tank again.

To provide a proper air-blast, I arrange a fan 20 in any convenient position, and this fan I drive by means of a belt 21, which runs upon a pulley carried by a counter-shaft 22,  
65 said counter-shaft in turn being driven by a belt 23, which runs upon a pulley carried by a line-shaft 24, and in order that the pump 11 may be driven only when the fan 20 is driven I provide its shaft 25 with a pulley 26, that is  
70 engaged by a belt 27, which runs upon a pulley carried by a counter-shaft 28, said counter-shaft carrying a pulley, which in turn runs in engagement with the belt 21, the counter-shaft being so mounted in practice that it  
75 will act as a belt-tightener for the belt 21.

In connection with the main blast or wind pipe 30 of the fan 20, I arrange pipes 31, which lead to the burners 32 of the forges 16, and in practice I prefer that the burners 32 should  
80 be similar to the burner illustrated, described, and claimed in my application for Letters Patent of the United States filed concurrently herewith. At all events, I would provide a  
85 burner wherein the blast slide or valve should be so arranged that it would be impossible to cut off the full supply of air.

From the construction above described it will be seen that the pump 11 cannot be called  
90 into play unless the fan 20 is at the same time driven to deliver a blast to the burners 32, and consequently all danger of flooding the burners and the forges is avoided.

Now, although I have illustrated a specific construction whereby the fan and pump are  
95 simultaneously driven, I desire it to be understood that this construction might be varied without departing from the spirit of my invention, the underlying principle of the invention being the driving of the pump through  
100 the medium of the fan-driving mechanism.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. An apparatus for burning hydrocarbon oil, consisting of a burner, an oil-tank below the burner, a stand-pipe leading up through the tank, an inclined pipe 14, connected at its  
5 lower end with the stand-pipe between the ends thereof and connected at its higher portion with the burner, a pump for raising the oil into the stand-pipe above the burner, an air-pipe also connected with the burner, a  
10 blower connected therewith, a belt operating said blower, and a second belt operating the oil-pump shaft from the first-named belt, substantially as set forth, whereby when the fan-belt ceases from any cause to operate the oil-  
15 pump will simultaneously stop and the oil return by gravity to the tank from the burner, substantially as set forth.

2. In an apparatus for burning hydrocarbon oil, the combination, with the oil-tank 10, a stand-pipe 12, extending up therethrough, a return-pipe 13, connected between its open  
20 ends with the upper end of the stand-pipe and at its lower end entering the tank, a centrifugal pump on the lower end of the stand-  
25 pipe for raising the oil therein, and a vertical

shaft leading down through the tank to the said pump, of the burner, a pipe leading from between the ends of the stand-pipe thereto, a blower having a pipe connecting it with the burner, a line-shaft, a belt driving the blower  
30 therefrom, and a second belt driven by said first belt and operating the vertical shaft of the pump, substantially as set forth.

3. An apparatus for burning hydrocarbon oil, consisting of a burner, an oil-tank below  
35 the burner, a stand-pipe leading up through the tank, an inclined pipe connected at its upper end with the burner and at its lower end with the stand-pipe between the ends thereof, an air-blast pipe connected with the  
40 burner, a centrifugal pump at the lower end of the stand-pipe for forcing the oil upwardly therein, and an overflow leading from the upper part of the stand-pipe into the tank, substantially as set forth.

ETHAN ROGERS.

Witnesses:

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WILLIAM GRIFFIN.