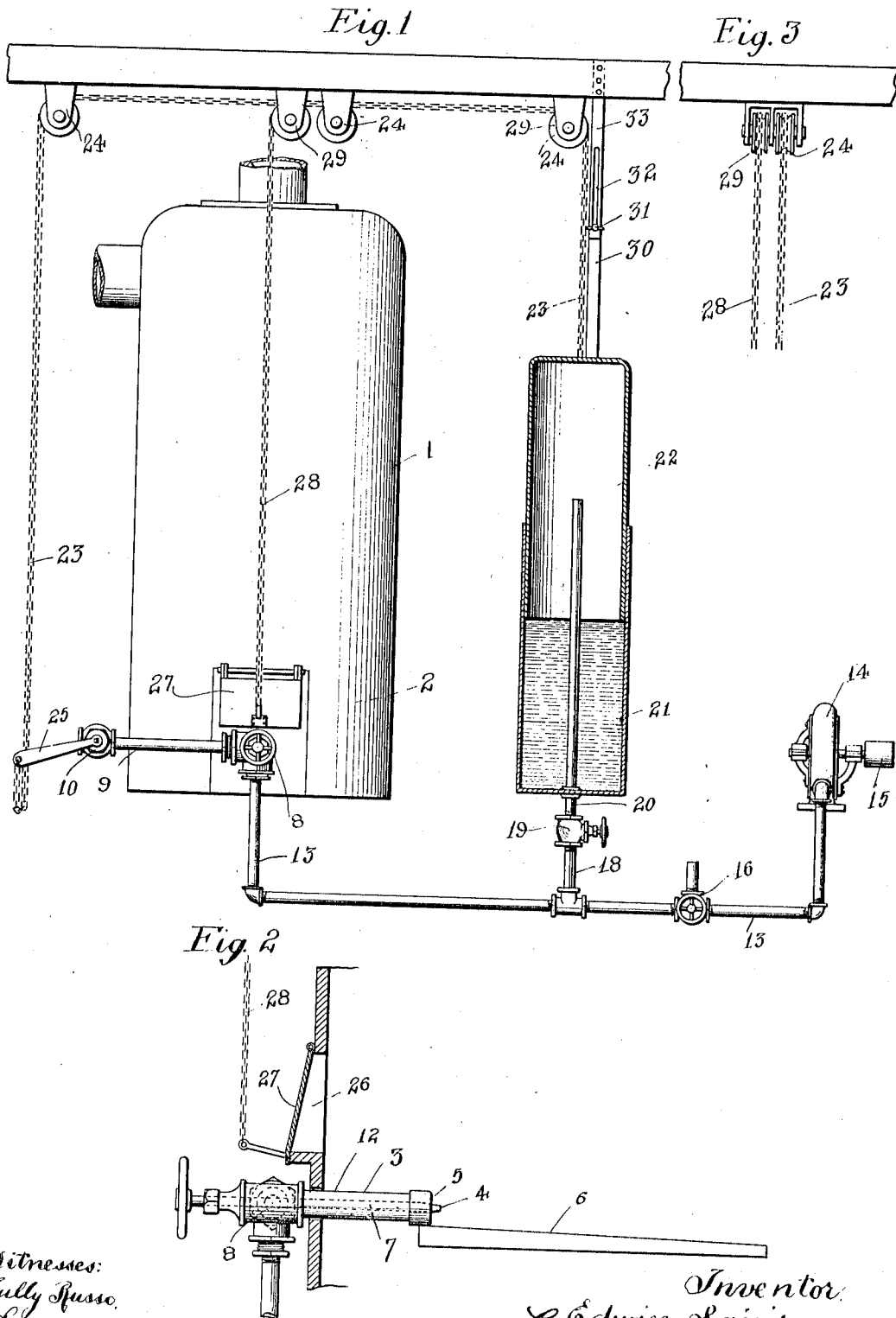


E. SQUIRE.
OIL BURNING FURNACE.
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Patented Sept. 24, 1912.



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UNITED STATES PATENT OFFICE.

EDWIN SQUIRE, OF CLAREMONT, CALIFORNIA.

OIL-BURNING FURNACE.

1,039,460.

Specification of Letters Patent. Patented Sept. 24, 1912.

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To all whom it may concern:

Be it known that I, EDWIN SQUIRE, a citizen of the United States, residing at Claremont, in the county of Los Angeles, State of California, have invented a new and useful Oil-Burning Furnace, of which the following is a specification.

This invention relates to oil burning furnaces using a supply of air under pressure in connection with the oil supply to produce a flame, and the main object of the invention is to provide means whereby the oil supply will be shut off automatically when the air supply fails so as to avoid the danger, inconvenience and waste that would ensue from the oil running into the furnace without access of sufficient air to burn the same.

A further object of the invention is to provide for a retarded cut-off of the oil supply under the conditions stated so that the oil will continue to run for a limited time when the air supply fails, thereby allowing for temporary failure in the air supply, leaving sufficient oil running to cause the burner to start up again without danger when the air supply is resumed.

Another object of the invention is to provide for an auxiliary natural draft air supply directly from the outer air when the compressed air supply fails.

Other objects of the invention will appear hereinafter.

The accompanying drawing illustrates an embodiment of the invention, and referring thereto—

Figure 1 is a side elevation of the furnace with the air and oil supply means therefor, the automatically controlling device for the oil supply being shown in section. Fig. 2 is a side elevation of the oil burner, the adjacent portion of the furnace wall being shown in section. Fig. 3 is an elevation of certain pulleys used in the invention.

1 designates a furnace casing which may be of any suitable construction and formed with an interior combustion chamber indicated at 2, into which the oil burner 3 extends. Said oil burner 3 may be of any suitable construction, consisting, for example, of a burner head having an outlet 4 for oil and an outlet 5 for air adjacent to the oil outlet. A firing and oil drip pan 6 may be provided adjacent to the oil burner to receive any temporary excess of oil and to facilitate starting the burner in operation. The oil outlet 4 communicates through a

pipe 7 and valve 8 with the oil supply pipe 9, in which is included a valve 10 operated automatically, as hereinafter set forth.

The air outlet 5 communicates through pipe 12 with a pipe 13 leading to any suitable source of compressed air, for example, a blower 14 operated by connection to a motor, for example, by means of a pulley 15 and belt running thereon. A relief valve 16 may be provided in the pipe 13 for controlling the amount of air flowing from the blower to the burner.

A pipe 18 communicates with the pipe 13 and is connected through a valve 19 with a pipe 20 extending upwardly into a tank 21 containing liquid and serving as the lower member of the gasometer, the upper member or bell 22 of the gasometer telescoping in the tank 21 and being suspended by a chain 23 running over pulleys 24 and connected to an arm 25 on the plug of the oil shut-off valve 10 aforesaid.

The parts are so proportioned as to weight that when there is no pressure in the interior of the gasometer bell 22 the weight of said bell will cause it to descend and through the chain 23 will turn the arm 25 so as to close the valve 10, thereby shutting off the supply of oil.

An auxiliary air inlet or opening 26 is preferably provided in the combustion chamber of the furnace, said inlet being normally closed by a damper or shut-off plate 27 operated by a chain 28 running over pulleys 29 and connected to the gasometer bell 22 so as to be operated thereby on failure of the compressed air supply.

When it is desired to start the burner oil is turned on by opening valves 8 and 10 and air is supplied through the pipe 13, the amount of air being regulated by adjustment of the relief valve 16, and this air issuing through the outlet 5 of the burner. The burner being lighted the oil is burned by combustion with the air supplied through pipe 13. The resistance to the efflux of air through the burner is sufficient to maintain a slight pressure in the pipe 13, and this pressure is communicated through the pipe 18, valve 19 and pipe 20 to the interior of the gasometer, causing the bell 22 to rise and slacking the chain 23. The valve 19 is preferably opened to only a slight extent so that the air will pass through the same gradually. If now there should be any temporary stoppage in the air supply due to the motor for

the pump ceasing to operate, the air will gradually leak from the interior of the gasometer through the connections 19, 18 and 13 and the outlet of the burner so that the member 22 will gradually descend and after a longer or shorter time, according to the adjustment of the apparatus, slack in chain 23 will be taken up and the oil valve will be closed, shutting off the supply of oil. In the meantime sufficient oil will be running to maintain the combustion in the furnace so that if, in the interim, the air supply should come on again the furnace will be in condition to renew its operation without relighting. If, however, the failure of air supply persists, the oil valve will be closed and remain closed, and by suitable adjustment the length of time required for the oil valve to close may be made sufficient to cover the period at which the furnace is capable of operation without compressed air supply and without the production of too much soot. On failure of the compressed air supply, the damper or air shut-off plate 27 will also be operated by the chain 28 in such manner as to admit an auxiliary supply of air by natural draft to the burner, so as to maintain the combustion more efficiently during this period of insufficient compressed air supply. This operation takes place at once on the failure of the forced draft, but the oil is not shut off until the slack in chain 23 has been taken up.

The upward movement of the gasometer bell is arrested by a stop consisting, for example, of a bar 30 adjustably connected by a bolt and slot connection 31, 32 to a fixed vertical bar 33 so as to provide for any desired amount of movement of the gasometer.

What I claim is:

1. The combination of a furnace, an oil burner therefor, compressed air supply means for said oil burner, a pressure operated controlling means communicating with said compressed air supply means to operate responsively to the pressure of the compressed air, an oil supply means for the burner, a valve for said oil supply means, a connection from said valve to said pressure operated controlling means to cut off the oil supply after a definite amount of movement of said controlling means so as to cut off the oil supply subsequently to the failure of the compressed air supply, an auxiliary air inlet

for the furnace open to the outer air, a damper therefor, and a connection from said damper to said pressure operated controlling means to open the said damper by operation of said pressure operated controlling means on failure of the compressed air supply.

2. The combination of a furnace, an oil burner therefor, compressed air supply means for said oil burner, air storage means communicating with said compressed air supply means, an oil supply means for the burner, a valve for said oil supply means, controlling means responsive to the pressure in the storage means and connected to said oil supply valve to cut off the oil supply on failure of the compressed air supply, and means for restricting the escape of compressed air from said storage means to retard the cut off of the oil supply.

3. The combination of a furnace, an oil burner therefor, compressed air supply means for said oil burner, a gasometer connected to said compressed air supply means, an oil supply means for the burner, a valve for said oil supply means, a connection from said valve to said gasometer to cut off the oil supply on failure of the air supply, and means for restricting the communication of air from said gasometer to the burner to retard the cut-off of the oil supply.

4. The combination of a furnace, an oil burner therefor, compressed air supply means for said oil burner, a gasometer connected to said compressed air supply means, an oil supply means for the burner, a valve for said oil supply means, a connection from said valve to said gasometer to cut off the oil supply on failure of the air supply, means for restricting the communication of air from said gasometer to the burner to retard the cut-off of the oil supply, an auxiliary air inlet for the furnace, a damper therefor, and a connection from said damper to said gasometer to open the said damper on failure of the compressed air supply.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 19th day of January 1912.

EDWIN SQUIRE.

In presence of—

ARTHUR P. KNIGHT,
GLADYS RUSSELL.