R. G. KIRKWOOD.

OIL BURNER STAND.

APPLICATION FILED AUG. 6, 1906.

1,001,863.

Patented Aug. 29, 1911.

2 SHEETS—SHEET 1

Fig. 1.

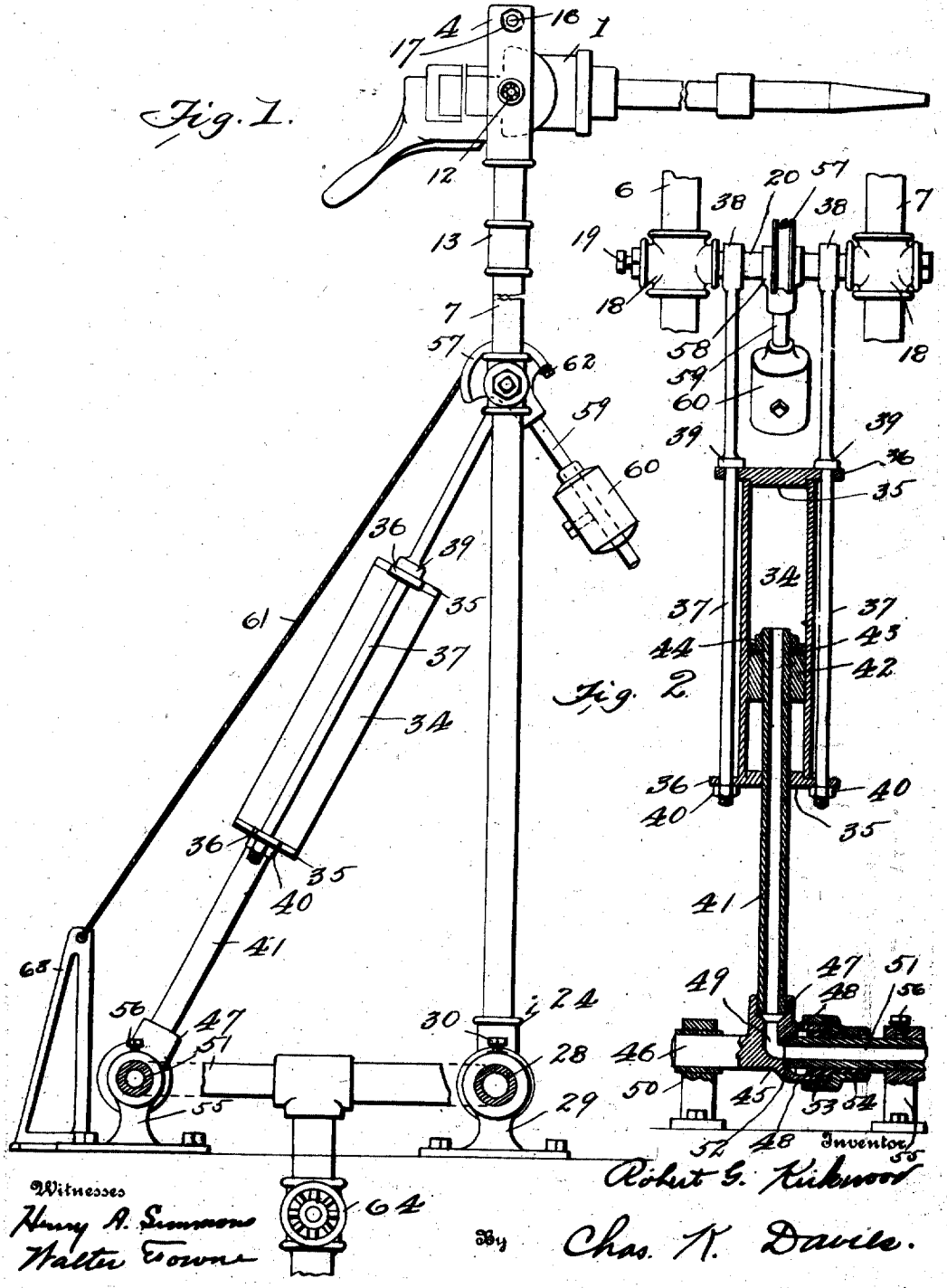

Fig. 2.

Witnesses

Henry A. Simmons

Walter Towne

Inventor

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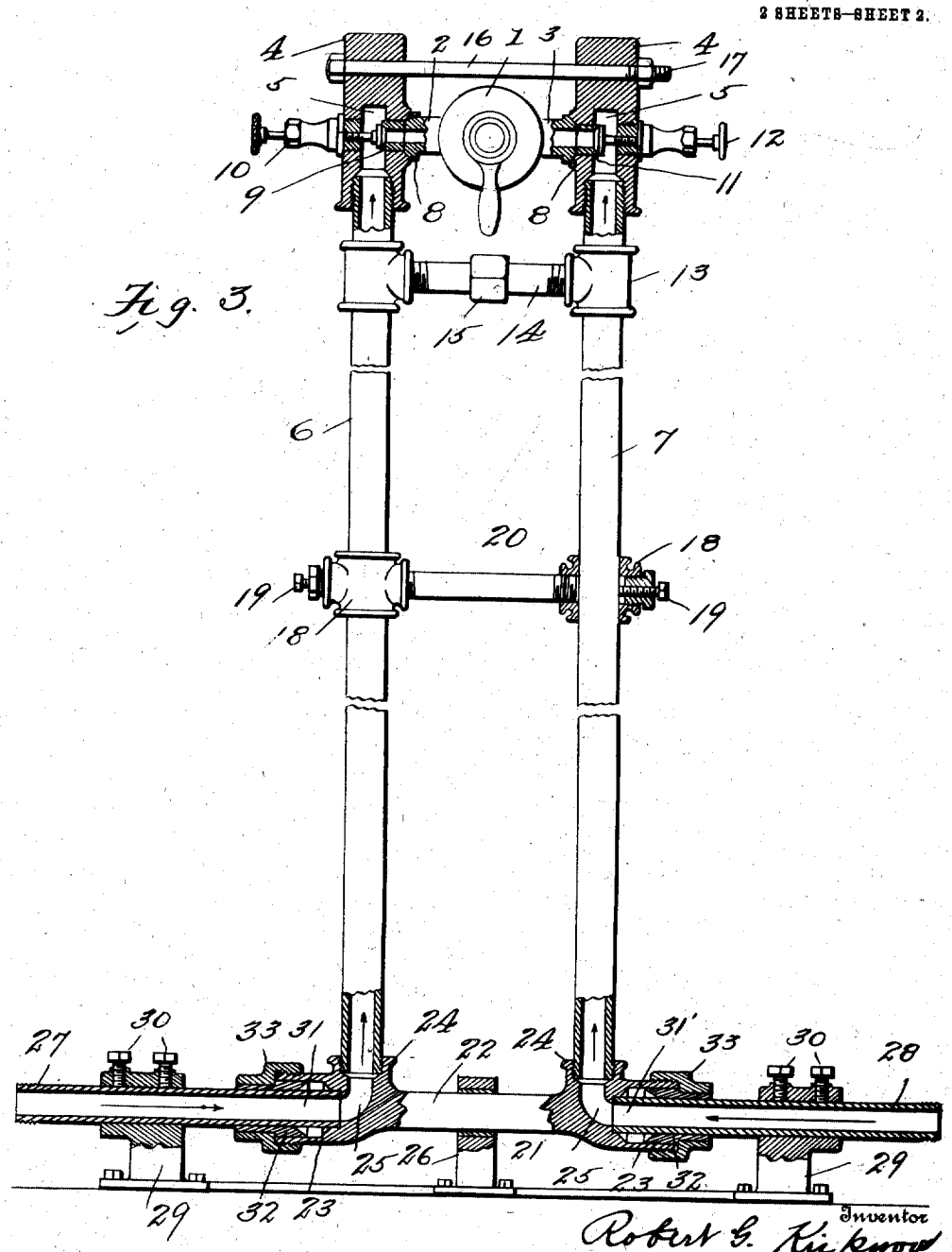

Fig. 3.

Witnesses

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UNITED STATES PATENT OFFICE.

ROBERT G. KIRKWOOD, OF PITTSBURG, PENNSYLVANIA.

OIL-BURNER STAND.

1,001,863. Specification of Letters Patent. Patented Aug. 29, 1911.

Application filed August 6, 1906. Serial No. 329,326.

To all whom it may concern.

Be it known that I, ROBERT G. KIRKWOOD, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Oil-Burner Stands, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to improvements in liquid or gaseous fuel burners, and especially to certain novel means for supporting and operating such a burner.

The improved supporting stand or frame and operating mechanism is especially intended for use in connection with open hearth steel melting furnaces. In many instances this class of furnaces is fired by two burners, using a burner at opposite ends of the furnace alternately, and as the heated gas from the operating burner passes off at the opposite end of the furnace, it is necessary to withdraw the nozzle of the idle burner from the mouth of the furnace to prevent melting off of the same from the gases of the operating burner.

The object of the present invention is to provide means for supporting such a burner as indicated above, which will supply fuel, such as oil and air to the burner, and at the same time provide the burner with movements to introduce, or withdraw the nozzle of the burner from the furnace in which the fuel is to be used.

A further object is to provide means by which the point or nozzle of the burner may be elevated or depressed as desired for use in the furnace.

The invention consists in certain novel features of construction in the supporting frame; a pivoted burner; regulating valves on the air and oil inlets, and certain combinations and arrangements of parts as hereinafter set forth.

In the present description of the device I shall refer to the use of oil and air as the fuel, and air as the operating means for the supporting frame, but it will be understood that other liquid or gaseous fuel may be used, and power other than air may be used to move the frame which supports the burner.

In the drawings I have illustrated one example of the physical embodiment of my invention, constructed according to the best mode I have so far devised for the practical application of the principles of the invention.

Figure 1 is a side elevation view of the burner, supporting frame and means for moving the frame. Fig. 2 is a sectional view of the air cylinder, piston, and its connections, and illustrates a portion of the supporting frame. Fig. 3 is a partial elevation and partial sectional view of the supporting frame, the means for operating the frame being omitted.

Referring to the drawings, the numeral 1 designates a burner of usual construction; 2, and 3 hollow arms forming a trunnion for pivotally supporting the burner, the arm 2 leading to the oil chamber of the burner and the arm 3 leading to the air chamber thereof; 4, 4, castings forming caps having a portion thereof bored to form a chamber 5, 5, and formed with screw threads to receive the threaded ends of the upright pipes 6 and 7; these pipes 6 and 7 form the supporting frame for the burner; 8, 8, tapered shoulders formed on the burner trunnions adapted to seat against complementary tapered openings in one of said castings 4; 9, a bushing forming a valve seat in one of said castings; 10, an oil valve to fit said seat; 11, a bushing in the other casting forming a valve seat; 12, a valve adapted to fit said seat 11 and regulate the inlet of air to the burner; 13, 13, a pair of T couplings surrounding the pipes 6 and 7 and provided with right and left hand screw threads, to receive complementary screws on the ends of the bar 14, which is provided with a squared portion 15 for turning; 16, a long bolt connecting the two castings 4, threaded at one end and provided with a nut 17; 18, 18, two cross couplings, one of which surrounds each pipe 6 and 7, and secured in adjusted position by set screws 19, 19, as will be understood; 20, a bar or stud shaft having opposite screw threads at its ends which are tapped into complementary threads in the couplings 18; 21, a metallic casting of proper shape, formed with a central journal portion 22, screw threaded enlarged extensions 23, 23, and interiorly threaded extensions 24, these four extensions being hollow and connected in pairs by the board passage 25; and the extensions 24 forming couplings for the reception of the threaded ends of the pipes 6 and 7 of

the burner supporting frame; 26 a supporting casting in which the casting 21 is journaled at its journal 22; 27, the oil feed or supply pipe; 28, the air supply pipe; 29, 29, castings, bored to receive the oil and air pipes, and provided with pairs of set screws 30, by means of which screws the pipes are held rigid with relation to their castings 29; 31, 31′, the inner ends of the supply pipes 27 and 28 which ends are located within the extensions 23 of casting 21; 32, 32, packing glands at the joint between pipes 27 and 28 and their respective extensions 23, 23; 33, 33, threaded nuts to engage the threaded extensions 23 to force the packing into the packing space to form an oil and air tight joint at the connections; 34, an air cylinder, preferably formed of brass tubing and provided with heads 35, each having a pair of perforated projecting lugs 36; 37, 37, a pair of suspending bars, each having a journaled end 38 adapted to swing on the stud shaft 20, and their outer threaded ends passed through the perforated lugs 36 on the air cylinder; 39, 39 shoulders formed on the bars 37, located adjacent the cylinder head 36, and adapted to bear thereon; 40, 40, nuts on the threaded ends of the bars 37, by means of which, in connection with the shoulders 39, the two heads 36 may be clamped with an air tight joint to the cylinder 34; 41, an air inlet pipe or tube passed through an opening in the lower head of the cylinder 34, and forming a stationary piston rod; 42, a piston located in the cylinder and secured by screw threads at the end of the air pipe 41; 43, a packing ring; 44, a packing nut; 45, a metallic casting provided with a journaled extension 46, an interiorly threaded extension 47, and exterior threaded extension 48, and a cord passage 49 which connects with the open ends of the extensions 47 and 48; 50, a supporting casting in which the journal 46 has a bearing; 51 a compressed air supply pipe; 52, a seat formed in the bore of the casting 45 to receive the end of the pipe 51; 53, a packing gland inclosed by the extension 48 and surrounding the pipe 51; 54, a packing nut, similar to the nuts 33 on the supporting frame, for securing an air tight joint between the pipes 41 and 51; 55, a supporting casting through which the pipe 51 is passed and secured rigidly therein by means of the set screw 56; 57 a sheave, loosely journaled by means of its hub on the shaft 20; 59, a bar or extension of the hub 58; 60, an adjustable weight connected to said bar; 61, a cord or rope having one end firmly secured at 62 to the sheave 57 and passed over said sheave, and 63 is a suitable anchor for the rope or cord 61.

The stand or supporting frame for the burner is arranged to receive oil from supply pipe 27 and compressed air from pipe 28 and convey these elements of the fuel through pipes 6 and 7, trunnion arms 2 and 3 and burner 1 and from the nozzle thereof the fuel passes into the furnace.

The hollow trunnion arms 2 and 3 have bearings in the castings or caps 4, and the oil burner may be elevated or depressed as desired on these trunnions as a pivot point. The bearings between the ends of the trunnion arms 2 and 3 and the openings in the castings 4 are ground to make a tight oil and air joint so that when the nut 17 on bolt 16, and the screw bar 14 are tight the trunnion of the burner is held between the castings 4, 4, and the joints are oil and air tight, but the joint also permits the burner to be oscillated in order to depress or elevate the nozzle thereof as desired. It will be observed that the valves 10 and 12 will be operative at all times to regulate the inlet of oil and air, regardless of the position of the burner.

The shaft 20 is rigid and does not rotate, except when turned by a wrench or other tool to adjust the distance between the pipes 6 and 7. The height of the shaft may be fixed by means of the set screws 19 which clamp the cross couplings 18 rigid with the upright pipes.

The supporting frame, carrying with it the burner, is adapted to swing on the journal 22 as a center to introduce the burner to, or withdraw it from the furnace. The oil supply pipe 27 and the air supply pipe 28 remain stationary, but when the frame is oscillated to move the burner the extensions 23 and their packed joints revolve around the ends of the respective pipes as a support, the main support for the swinging movement however, being the casting 26 in which the journal 22 rotates. The drawings illustrate one example of a desirable form of joint, the essential feature being that the frame shall swing, but at all times be in communication with the supply pipes.

Various ways may be adapted for use in swinging the frame to introduce the burner to or withdraw the same from the furnace. In the accompanying drawings I employ mechanism operated by the same air pressure which feeds the oil to the burner and furnace. To give the swinging movement to the supporting frame I provide the air or steam cylinder having a movable or swinging piston, to which is connected a hollow piston rod which forms the air inlet pipe to the cylinder. One end of the piston rod is connected to a rotatable casting in manner similar to the connection between the supporting frame and its supply pipes. The ends of the suspending rods are loosely journaled on the shaft 20 allowing the cylinder to oscillate when the supporting frame changes its position from vertical to inclined. The stud shaft carries a loose sheave

thereon provided with a weighted arm and the sheave is connected by rope 61 to the anchor 63. By opening valve 64, the motive pressure for moving the frame to position to introduce the burner into the furnace, and for supplying the feed of air to the furnace, is turned on simultaneously, and by closing the valve the pressure is discontinued.

When the burner is to be introduced to the furnace, valve 64 is opened and compressed air passes through pipe 7 to the burner as described; the air also passes into the cylinder from pipe 51, casting 45 and pipe 41. The cylinder is forced away from the piston, (the cylinder swinging on the shaft 20 as a center and the piston rod swinging on journal 46) and the rods 37 push or force the supporting frame in a swinging motion with the journal 22 as a center. The rope 61 fastened to the anchor and being fast to the sheave, causes the sheave to turn on the stud shaft, lifting the weight 60 toward a horizontal position, until the frame carrying the burner reaches the desired position with relation to the furnace which the burner is to fire. The oil or other fuel being turned on, the fire is regulated by means of the valves 10 and 12. When it is desired to withdraw the burner from the furnace, the oil is turned off and valve 64 is closed, allowing the pressure to escape from the cylinder through burner pipe 7. The weight 60 falls winding the rope around the sheave until the weighted arm assumes the position shown in Fig. 1. A further drop of the weight to vertical position causes the supporting frame to pass beyond its upright position, and its own weight serves to carry it beyond the upright position to an inclined position away from the furnace, thus withdrawing the burner from the heated furnace.

Having thus fully described my invention, what I claim as new and desire to cover by Letters Patent is:

1. A pair of feed pipes each having a chambered cap thereon, an oil burner having hollow trunnions provided with conical ends to fit complementary seats in said caps, valves located in said caps for regulating the admission of fuel through said trunnions, and a threaded bar engaging a portion of each pipe for holding them in adjusted relation.

2. A pair of feed pipes each having a chambered cap thereon, a burner having hollow trunnions pivotally engaging said caps, means for holding said pipes in adjusted position, bushings in the caps formed with valve seats, and valves adapted to fit said seats.

3. The combination with a hollow supporting frame, of a pivoted burner having hollow trunnions communicating with said frame, a bushing at the end of each trunnion with valve seats formed therein, and valves in the supporting frame adapted to fit said seats.

4. A pair of feed pipes each having a chambered cap thereon, a burner having hollow trunnions formed with conical ends engaging recesses in said caps, means for holding the pipes in adjusted position, bushings in the caps formed with valve seats, and valves adapted to fit said seats.

5. A pair of feed pipes each having a chambered cap thereon, a burner having hollow trunnions formed with conical ends engaging recesses in said caps, a threaded bar engaging means on each pipe to hold them in adjusted position, bushings in the caps formed with valve seats, and valves adapted to fit said seats.

6. A pair of feed pipes each having a chambered cap screwed thereon, a burner having hollow trunnions formed with conical ends engaging complementary recesses in said caps, a sleeve on each pipe and a threaded adjusting bar engaging said sleeves, bushings in the caps formed with valve seats, and valves adapted to fit said seats.

7. The combination with a frame composed of supply pipes, of chambered caps, a burner having open trunnions communicating with said caps, valve seats formed in the caps and valves therefor to control the supply of fuel elements through the trunnions, and means whereby said frame is adapted to oscillate.

8. The combination with a frame composed of a pair of pipes, a base piece joining said pipes adapted to rotate and formed with passages connecting said pipes with the supply of elements of fuel; chambered caps on the pipes, and a burner having hollow trunnions opening into and supported by said caps.

9. The combination with a frame adapted to oscillate, of a burner pivotally supported in said frame, means for moving said frame into operative position, and automatic means for moving said frame out of operative position.

10. The combination with a frame adapted to oscillate, of a burner supported in the frame, means for moving said frame and burner into operative position, and automatic means for moving the same out of operative position.

11. The combination with a frame composed of feed pipes and adapted to oscillate, of a burner in communication with said pipes, and means for utilizing one of the elements of fuel under pressure for moving the frame and burner to operative position.

12. The combination with an oscillating frame, of a burner supported therein, means for utilizing one of the fuel elements under pressure for moving the frame and burner

into operative position, and a weight for withdrawing the frame and burner from operative position.

13. The combination with a burner, of an oscillating frame, a cylinder having pivotal connection therewith, a piston within the cylinder adapted to oscillate the frame in one direction, and a counterbalance to return the frame to normal position.

14. The combination with an oscillating frame, and a burner pivotally supported therein, of a cylinder having pivotal connection with the frame, a piston within the cylinder adapted to move the frame and burner to operative position.

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

ROBERT G. KIRKWOOD.

Witnesses:
CHAS. K. DAVIES,
A. M. PARKINS.