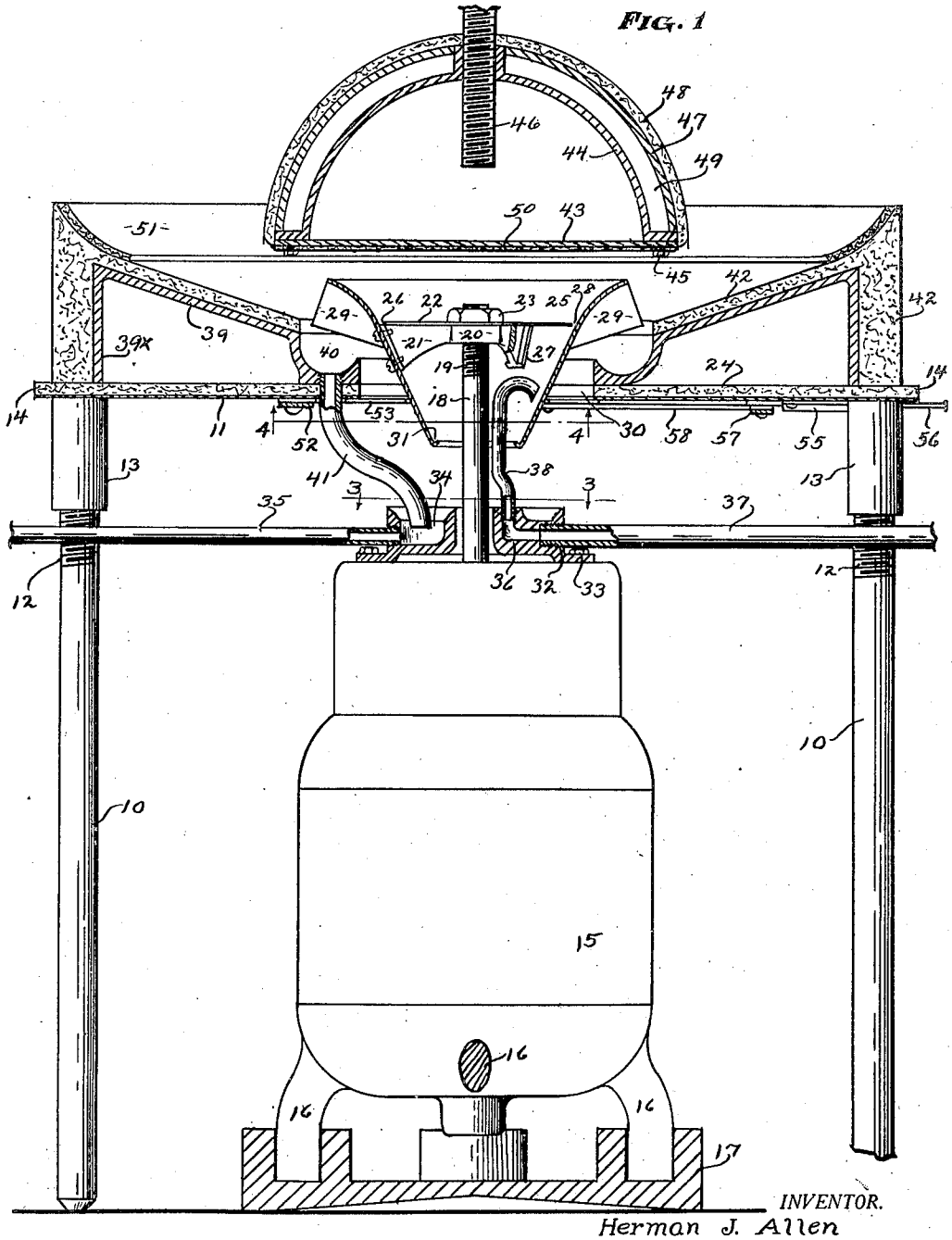
June 17, 1924. 1,497,829

H. J. ALLEN ET AL

OIL BURNER

Original Filed July 1, 1922 3 Sheets-Sheet 1

FIG. 1



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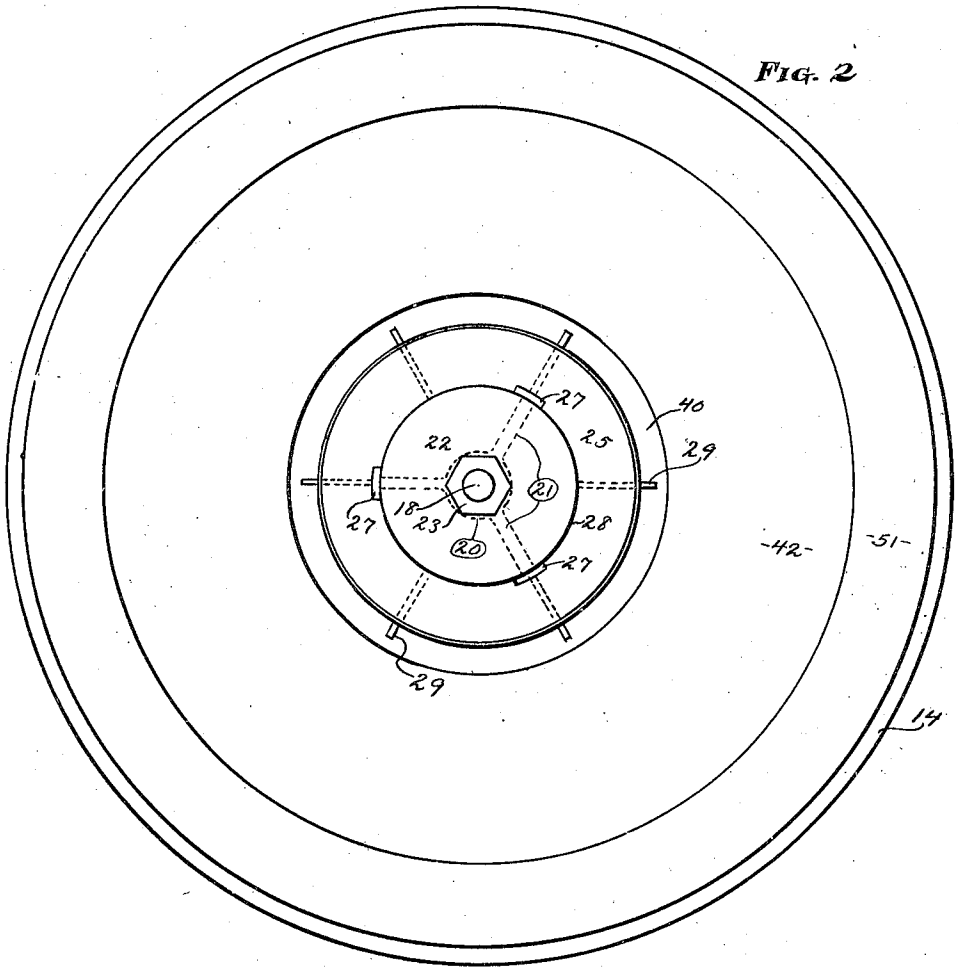
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FIG. 2



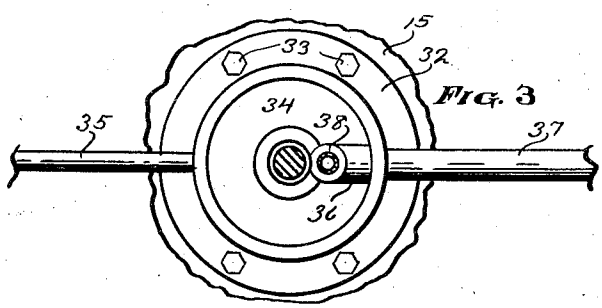


FIG. 3

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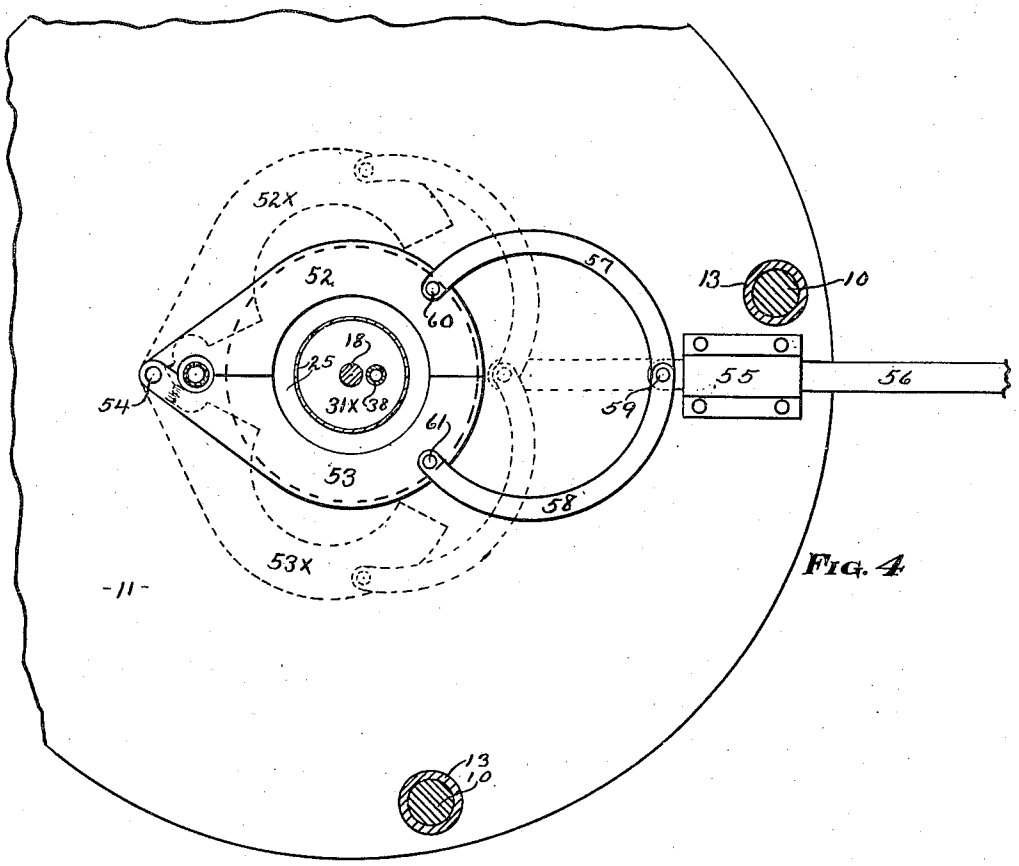


FIG. 4

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UNITED STATES PATENT OFFICE.

HERMAN J. ALLEN AND MARVIN LEE, OF WICHITA, KANSAS.

OIL BURNER.

Application filed July 1, 1922, Serial No. 572,220. Renewed May 2, 1924.

To all whom it may concern:

Be it known that we, HERMAN J. ALLEN and MARVIN LEE, citizens of the United States, residing at Wichita, in the county of Sedgwick and State of Kansas, have invented certain new and useful Improvements in Oil Burners, of which the following is a description, referring to the drawings which accompany this specification.

Our invention relates to that type of oil burners in which through the employment of a motor in operative combination therewith and by elements rotated thereby, a centrifugal motion is accorded to the oil and air mixture and blown as an atomized spray upon the burner surfaces for ignition purposes to then develop a horizontal and annular flame. Our type of burner may be employed in lieu of the coal grates generally employed in hot air, steam, hot water and vapor-vacuum furnaces; it is especially designed however for use in domestic installations employing annular sections, vertically combined. Our burner and motor are combined as a unit in the manufacture of the composite device.

Previous installations of the general character described above have proven objectionable in varied respects, for instance the proper adjustment and control of the air supply has not been properly taken care of; the waste oil is recollected for storage in our invention and all packings and stuffing boxes eliminated thereby rendering the device operable in a more perfect manner. Due to the inverted bell-shaped character of the centrifugally operable oil throwing receptacle, certain relations of a fixed air supply, oil reception and oil-air agitation are developed and whereby a primary comingling is accomplished prior to meeting the baffle plate and later permitted to follow the outwardly flaring lines of the inverted bell in the centrifugal travel of the oil-air mixture and to leave same as a spray to meet a further air spray likewise centrifugally functioning and adjustable features for controlling the volume of said secondary source of air supply.

Our burner very efficiently heats the furnace by directing the flame in an outwardly disposed annular flame in contra-distinction to burners of the central conical type or inwardly disposed horizontal type, a major portion of whose heat units are lost through the flue without being absorbed by the walls of the furnace or heater.

There are no heat losses on account of sooty deposits, our burner under operating conditions giving a smokeless flame, consequently labor costs of removing sooty deposits are entirely eliminated.

In the drawings, Fig. 1 shows a vertical section of our improved burner as supported from adjustable leg elements and in combination with a vertically disposed motor shown in elevation; allied features essential to the operation of the burner mechanism are illustrated in section and in their preferred arrangement in the combination. Fig. 2 is a top view of Fig. 1 with the bell-shaped deflector and heat protecting element removed. Figs. 3 and 4 represent sectional views taken along the lines 3—3 and 4—4, Fig. 1 and looking respectively, in the direction of their arrows. Similar numerals of reference indicate corresponding parts throughout all the figures of the drawings.

Referring to the drawings; mounted upon a plurality of leg standards as supporting elements 10 is shown a horizontally disposed metallic plate 11 as a base or seat for the burner. The legs 10 are threaded at 12 upon which are screwed unions 13 and by means of which the plate 11 is properly leveled and positioned at a desired level within the firebox of the furnace. The periphery 14 of the plate 11 closely approximates the shape and area of the firebox and packing, (not shown) may be employed around the edge 14 so as to prevent air currents from below rising upwardly towards the flame. A motor 15 supported on legs 16 resting in a central base supporting casting 17 is centrally and vertically disposed beneath the plate 11 with the motor shaft 18 in a vertical plane as disclosed. The shaft 18 is threaded at its end 19 to receive the threaded hub 20 of the casting seen in Fig. 1 which includes radially extending fins 21 and upon which a horizontally disposed baffle plate 22 rests and is secured by the lock nut 23 engaging the threaded end 19 of the shaft 18. It will thus be seen that the parts 20, 21, 22 and 23 are adjustable from or towards the motor for purposes later explained. The plate 11 is covered with asbestos 24 or other suitable material. At 25 is shown an inverted bell-shaped ele-

ment which is bolted as at 26 to outer flange elements 27 of the fins 21. It will here be noted that the circumference of the baffle plate 22 does not quite reach to meet the bell element 25 thus providing an annular passage 28 for oil and air flow as later explained. A plurality of radially extending fins or wings are formed as at 29 on the upper and outer surface of the bell element 25. A circular opening is centrally formed in the sheets 11 and 24 at 30 thus leaving an annular air passage surrounding the outer walls of the element 25 as will be readily understood. The base of the bell 25 is not made solid neither does it form a boxing or bearing for the shaft 18 but it is cut away to form an enlarged opening through which the said shaft 18 is freely passed and as illustrated in Fig. 1, the edges of the metal adjacent this opening are curled upwardly to form a trough element of annular character as shown at 31.

A casting 32 is bolted as at 33 to the top end of the motor 15 and is provided with an annular ring portion 34 to receive unburnt oils as later explained and from which outwardly leads to a storage tank (not shown) a pipe 35 for carrying away the unburnt oils as collected in the annular ring portion 34. An L shaped tubular element 36 is cast integral with the member 32, the oil supply pipe 37 engages the L element 36; a pipe 38 leads away from the L 36 and its upper end is bent towards the trough 31 so that incoming oil is first deposited into said trough 31 of the motor driven bell element 25. It will also be noted that the fins 21 are likewise in rotation and air entering the opening in the base of the bell 25 mingles with the oil flow centrifugally traveling upwardly and outwardly past the passageway 28; it will here be noted how the inverted flaring edge portion of the bell 25 extending beyond the baffle plate 22 serves to still support and control the oil-air mixture prior to casting it outwardly for burner consumption.

Concentric with and supported by the elements 11—24 is shown the circular disc or metallic plate 39, whose flanged periphery 39× seats upon the plate 11—24 and its central portion being cut away to provide an opening equivalent to the opening 30, is formed as an annular trough element 40 from which leads a pipe 41 to carry unburnt oils that may be collected in the trough 40 into the trough 34 for storage disposal. An asbestos covering 42 upon the plate 39 completes the burner installation, proper. It being however noted that the periphery of the covering 42 is above the periphery of the inverted bell 25, while the lower or central portion of the dish-shaped plate 39 is arranged at a lower level than the periphery of the bell 25.

Arranged above and concentric therewith is shown a bell shaped element comprising a horizontal base plate 43, a bell shaped element 44 supported by and bolted to the plate 43 as at 45 and having a central threaded hub portion engaging for adjustment purposes a bolt 46 depending from an upper portion of the firebox of the furnace (not shown). A second bell shaped element 47 covered by asbestos covering 48 caps the first mentioned element 44 to provide an air spacing 49. The plate 43 is faced with asbestos 50.

The opening 30 may be restricted in size or otherwise closed or partially closed for major adjustment purposes; by means of the adjustments 20—23, the bell 25 may be raised or lowered in the opening 30 thus enlarging or decreasing the air passage leading to the fan elements 29 which force this adjusted air current to mingle with the first mentioned air-oil current as centrifugally cast from the upper periphery of the bell 25 towards the periphery of the burner covering 42. Such oils as are not burned or absorbed by the asbestos 42 flow back through 40—41—34 and pipe 35 to storage.

The bell elements 43—49 insulate the bell 28 and its oil-air spray so that the vaporization takes place in the outer annular ring where the ignition takes place. It will be especially noted that the position of the baffle plate 22 serves to prevent oil striking the plate 43, while assisting in conducting the flow of air-oil mixture upon the inner surface of the bell 25 for centrifugal horizontal casting purposes.

The asbestos covering 42 is relatively hard and compact and is covered around its periphery by an annular ring 51 of absorbing asbestos as a wick like element.

In addition to the adjustments 20—23 mentioned above for controlling the size of the opening 30, we may employ the auxiliary and positively acting damper mechanism illustrated in Figs. 1 and 4, wherein the opening 30 is shown fully closed, the only passage being that through the opening 31× through the base of the inverted bell-shaped device 25.

Referring to Figs. 1 and 4, the damper comprises two sections 52 and 53, preferably of sheet metal, each pivoting on the bolt 54 attached to the plate 11 and against which they are arranged to slidably be moved as later shown. These sections 52 and 53 are shaped to fit around the bell device 25 and to snugly fit the same when they are fully closed as illustrated in Fig. 4 and whereby the opening 30 is completely closed up. At 55 is a guide riveted to the plate 11; a sliding bar 56, housed in the guide 55, has two curved arm elements 57, 58 pivotally attached thereto at 59. The arms 57 and 58 pivotally engage at 60 and 61 to their re-

spective sections 52 and 53 as illustrated so that when the bar 56 is inwardly moved, the sections 52 and 53 will pivot outwardly to their ultimate or dotted positions 52^x and 53^x and in which position, the opening 30 will be fully and entirely uncovered to permit maximum air passage.

It is thus apparent that any desired area may be given the opening 30 intermediate that of zero and maximum areas; while the adjustments at 20 and 23 operate to accomplish a similar purpose with the additional features of adjusting the angle of centrifugal spraying action to best function with the bell device 43 and asbestos ring 51 for burner purposes.

Having fully described our invention and reserving the right to make such further modifications as lie within the scope of the appended claims, we desire to secure by Letters Patent:

1. In an oil burner, a motor, a vertical shaft rotatable by said motor; a hub adjustably carried by the upper portion of said shaft above the motor, fins radiating from the hub; a baffle plate supported upon and rigid to said fins; an inverted bell-shaped device, having an air port at its base and an oil trough adjacent thereto, rigid with said fins, the upper portion of said bell-shaped device extending above and beyond said baffle plate and an annular passage intermediate said device and baffle plate.

2. In an oil burner, a motor, a vertical shaft rotatable by said motor; a hub adjustably carried by the upper portion of said shaft above the motor, fins radiating from the hub; a baffle plate secured above the fins; an inverted bell-shaped device having an air port at its base surrounding the motor shaft, an oil trough formed by upturned lower edge portions of said device, an oil supply leading to said trough and wings outwardly radiating from the exterior surfaces of said inverted bell-shaped device; the upper portion of said bell-shaped device extending above and beyond said baffle plate and an annular passageway intermediate said device and baffle plate.

3. In an oil burner, an inverted bell-shaped device rotatably operable, an air port therein and an inner concentric oil trough adjacent said port; an annular plate concentric with said device, an annular trough underlying the periphery of the device; means for adjustably positioning the device from or towards said plate and for adjusting thereby an auxiliary air intake space intermediate said plate and the device for the purposes specified.

4. In an oil burner, a motor, a vertical shaft operable thereby; a hub adjustably mounted on said shaft, fins rigid with said hub, a baffle plate supported by said fins; an inverted bell-shaped device having an air port in the base thereof surrounding said shaft, an oil trough formed by upturned edges of the base of said device, an oil supply pipe leading to said trough, and wings outwardly radiating from the exterior of said device; the upper portion of said device extending upwardly and outwardly beyond said baffle plate and an annular passage therebetween; an annular plate concentric with said shaft, an annular air passage between said inverted bell shaped device and said annular plate and susceptible to adjustment as to air capacity through the vertical adjustment of said hub supported bell shaped device; an annular trough on said annular plate underlying the periphery of said inverted bell shaped device, an oil exit pipe leading therefrom; and means for supporting said foregoing elements in coacting relationship for the purposes specified.

5. In an oil burner, a motor, a vertical shaft operable thereby: a hub adjustably mounted on said shaft, fins rigid with said hub, a baffle plate supported by said fins; an inverted bell-shaped device, having an air port in the base thereof, carried by said fins and an oil trough in said device adjacent said air port; an oil supply pipe leading to said trough; wings, outwardly radiating, rigid with said device; the upper portion of said device extending upwardly and outwardly beyond said baffle plate and an annular passage therebetween; an annular plate concentric with the shaft and covered with asbestos terminating in an annular asbestos wicking; an annular passage intermediate the bell-shaped device and said annular plate, an annular trough adjacent said annular passage, an oil exit pipe leading therefrom; and pivotally acting damper means for adjustably opening and closing said annular passage for the purposes specified.

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