Jan. 11, 1949. G. C. PETER 2,458,916

COMBINED BAFFLE AND OIL SUPPLY MEANS FOR OIL BURNERS

Filed Nov. 29, 1946 2 Sheets-Sheet 1

Fig. 1.

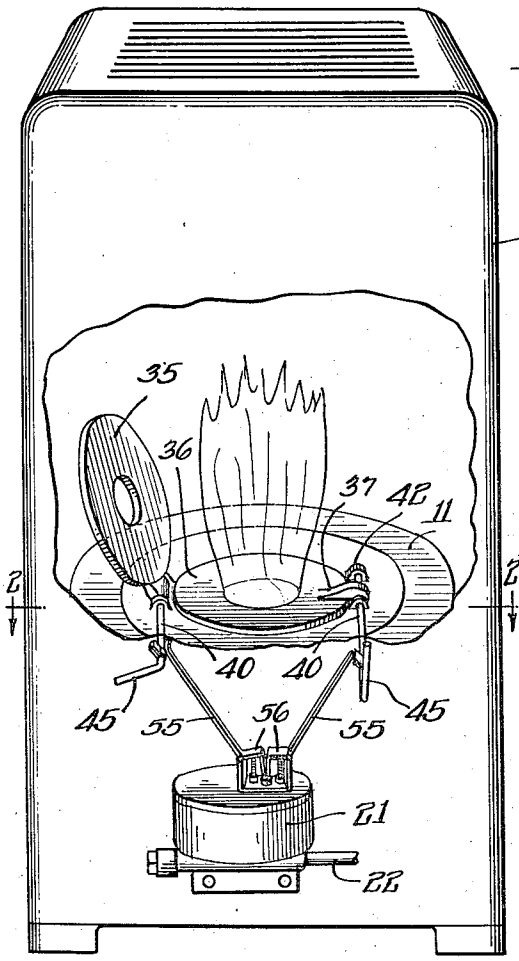
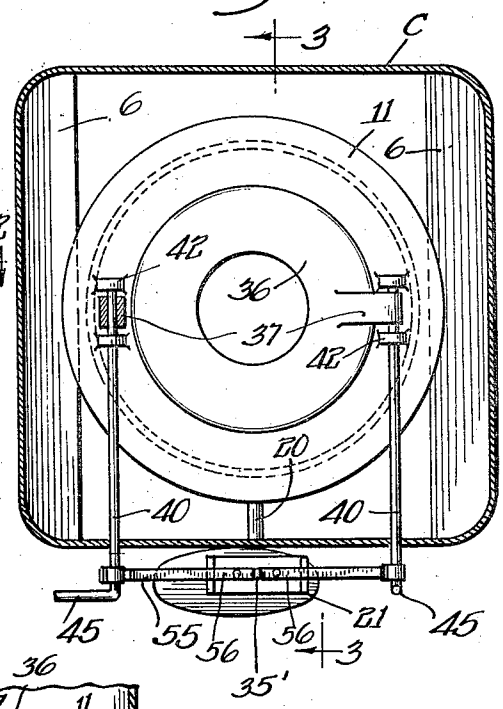


Fig. 2.



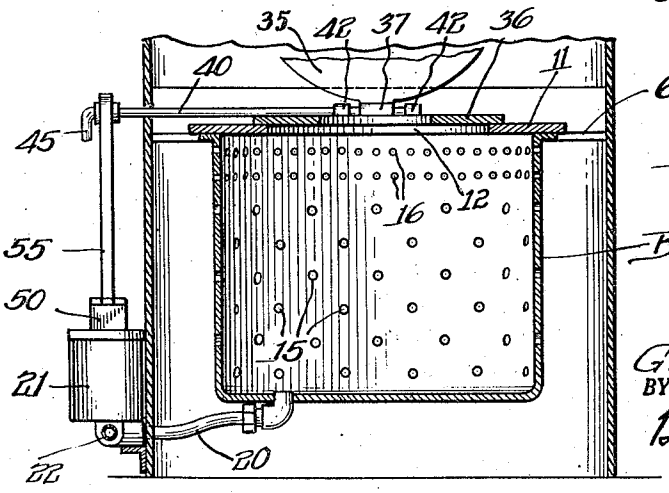


Fig. 3.

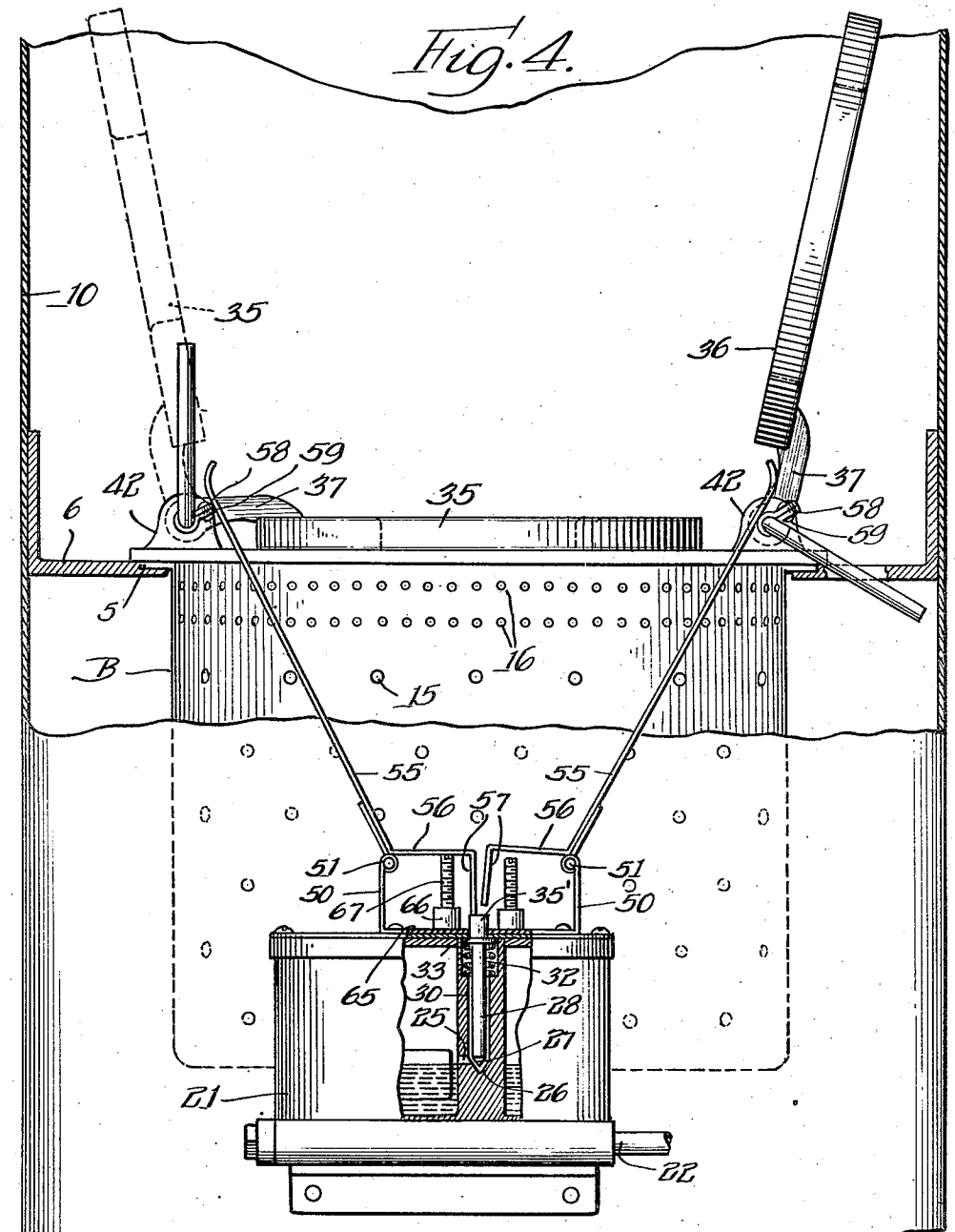
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Fig. 4.



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COMBINED BAFFLE AND OIL SUPPLY MEANS FOR OIL BURNERS

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12 Claims. (Cl. 158—28)

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My present invention is concerned with a combined baffle and oil supply means for oil burners. A principal object of the invention is to provide for varying concurrently the flow of vapor from the vaporizing chamber and the amount of liquid fuel entering into the same.

Specifically, the present improvements are concerned with an oil burner having means for changing the size of the opening between the vaporizing and combustion chambers, consisting of a plurality of baffle plates each having a central opening of smaller size than the opening between the vaporizing and combustion chambers, and each different from the others; together with a fuel control valve connected with the mechanism for operating the baffle plates whereby to vary the amount of fuel entering the vaporizer in accordance with the area of the central opening through the baffle plate which is in operative position at the time. Between the baffle operating means and the fuel control valve I provide operative interconnections which are simple, dependable, inexpensive, and easy to install, and which provide a combined control that is advantageous from the standpoints of economy in fuel consumption, and clean combustion during the stages of low, intermediate and high fires.

An exemplification of this invention in a preferred form is illustrated in the accompanying drawings wherein

Fig. 1 is a view in elevation of a cabinet containing an oil burner equipped with the interrelated dual control of this invention, the front wall of the cabinet being broken away to exhibit the top of the pot burner interiorly thereof;

Fig. 2 is a transverse section taken on line 2—2 of Fig. 1;

Fig. 3 is a vertical section taken on line 3—3 of Fig. 2; and

Fig. 4 is a view in elevation, somewhat enlarged, of the lower end of the cabinet, broken away in part to exhibit the oil burner and combustion chamber therewithin;

The oil burner, here shown as of the space heater type, is provided with a cabinet C wherein is contained a pot burner B having a top flange 5 adapted to rest upon an annular ledge 6 extending inwardly from the cabinet walls in whose upper region is the combustion chamber. The pot burner shown in section in Fig. 3, is provided at the top with a baffle plate in the form of an annular ring 11 having a central opening 12 which constitutes the passageway between the vaporizing chamber within the pot burner and

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the combustion chamber thereabove. The walls of the pot burner are formed with air ports 15 constituting primary air inlets, and near its top with other ports 16 which serve as secondary air inlets. These ports may be of whatever size, number, and arrangement that is desired for the intended purpose, it being preferred that the secondary air inlets near the top be somewhat more closely grouped together, as shown.

Liquid fuel is admitted into the pot burner close to its bottom through a conduit 20 which extends from a float chamber 21 that is mounted exteriorly of the combustion chamber. This float chamber may be of any approved design with an inlet near the bottom for fuel which is conducted thereto through a pipe 22. The liquid fuel in flowing through the chamber is taken through a passageway 25 wherein is a well 26 into which may enter the conical valve 27 at the bottom end of a valve stem 28 that is reciprocably mounted within a vertical passageway 30. Near its top this passageway is enlarged to accommodate a coil spring 32 which exerts an upward thrust on a collar 33 that is affixed to the stem having its top end terminating in a head 35' which is protruded upwardly beyond the top face of the float chamber. The vertical position of the valve will determine the size of the opening at the passageway 25 through which liquid fuel must flow in reaching the outlet of the float chamber for conduction through the pipe 20 into the pot burner.

The air control which I provide consists of mountings near opposite edges of the baffle plate 11 for other hinged baffle plates 35 and 36. Each of these plates is carried by an arm 37 which joins thereto near one edge thereof, and is provided with a transverse opening through which may be extended an operating rod 40 which is made fast thereto. Each rod is rotatably supported within a pair of ears 42 which upstand from the fixed baffle plate 11, and is extended laterally and outwardly away from the pot burner through the walls of the cabinet C so as to be accessible for manipulation upon the outer front face thereof where a laterally turned extension 45 provides an operating handle therefor.

The two baffle plates 35 and 36 are each annular in form to provide a center opening, but the openings of these two plates differ in size from each other, and both are smaller than the opening 12 in the fixed baffle plate 11. By operation of either of the handles 45, the associated baffle plate 35 or 36, as the case may be, may be swung down to a horizontal position overlying the fixed plate 11, the effect being to reduce the size of the opening

which intervenes between the vaporizing and combustion chambers. The baffle plate 11 acts as a high fire damper because its opening is the largest; the baffle 36 is the intermediate fire damper because its opening is somewhat less in size; and the baffle 35 is the low fire damper because its opening is the smallest. Since it is possible to swing down into operative position upon the pot burner either of the baffle plates 35 or 36, or leave both of them in up position, this simple arrangement provides for three sizes of openings to be selectively used, depending upon whether it is a low fire, medium fire, or high fire condition to be favored.

For best results it is desirable that the amount of fuel entering into the pot burner be varied in accordance with the conditions within the vaporizing chamber. Since these conditions are largely a function of the area of the opening between the vaporizing and combustion chambers, I have provided thrust motion transmitting means for varying the position of the fuel valve 28 in accordance with operation of the baffle plates at the top of the burner. This part of my invention will now be described.

To the top of the float chamber I affix a pair of supporting brackets 50, both alike, and located by preference at opposite sides of the valve stem head 35'. Each bracket is provided at its top with a pivotal mounting 51 for a bell crank having a relatively vertical arm 55 and a relatively horizontal arm 56 from whose free end depends a finger 57 adapted to bear upon the head 35' of the valve stem 28. Each upstanding arm 55 also extends outwardly to engage a cam 58 on the proximate shaft 40. As shown, each cam consists of a strap encircling the shaft with its two ends joined as by a screw 59.

The brackets 50 extend upwardly from a base 65 which carries a pair of bosses 66 each threaded to receive an adjustable stop screw 67 which projects upwardly therefrom for a desired distance. As shown in Fig. 4, one of these screws extends upwardly from the top of the float chamber slightly higher than does the other. The top end of each screw furnishes a stop against which the crank arm 56 will abut to limit its rocking movement inwardly and downwardly, thereby determining the distance to which the valve stem will be depressed in response to such motion. It is obvious that by adjusting the two screws 67 to different heights the two bell cranks, when operated, will depress the valve stem 28 for different distances, thereby varying the clearance through the fuel passageway 25.

If both baffle plates 35 and 36 be allowed to remain in their up positions, as shown by full lines at the right of Fig. 4 and by dotted lines at the left thereof, both bell cranks 55 will be free to rock back by gravity so as to rest against the shafts 40. The rotative position of each cam 58 is such as to assure this result. The valve stem 28 under such conditions will rise to its top position whereby a maximum flow of fuel to the pot burner may take place. This is the condition which obtains for high fire. For the low fire condition, however, the baffle plate 35 is lowered to position as indicated by the full line showing in Fig. 4. Here the bell crank arm 55 is tilted forwardly to lower its arm 56 to the limit permitted by the stop screw 67. The valve stem 28 is then pushed down to reduce to a minimum the clearance through the conduit 25, as required for a low fire condition. Should the other baffle plate 36 be lowered to position, instead of the plate 35, then the controls will be set for a medium fire condition. Here the size of the opening through the baffle plate is somewhat reduced from that which is provided in the fixed baffle plate 11. In reaching this position, the cam 58 on the associated shaft 40 pushes the bell crank arm 55 inwardly to depress its lower arm 56 as far as is permitted by the adjustment of the stop screw 67. This is so placed as to arrest down movement of the valve stem 28 when it has partially closed the conduit 25, but not so much so as in the adjustment for low fire.

It will be observed that the parts entering into the dual control herein described are very few and simple in construction. When once installed, they may be operated conveniently from the outside of the cabinet at the point where the fuel control valve is ordinarily placed. At the start, adjustments are made for the low fire condition by swinging the baffle plate 35 into operative position. Later, this is replaced by the baffle plate 36 so as to provide favorable conditions for a medium fire. In each of these operations, the fuel valve is also operated so as to regulate in accordance therewith the amount of fuel admitted to the pot burner. Finally, when high fire conditions prevail, both baffle plates 35 and 36 are raised so that a maximum clearance may obtain between the vaporizing and combustion chambers, with the fuel valve also opened to its maximum position.

By the means herein described, any separate operation of the flow control means can be eliminated. In choosing the proper fire by operation of the control for the baffle plates, the oil control is automatically operated, thereby providing a dependable arrangement for control of the fuel feed. While the mechanism heretofore described is one that may be manually operated, it is apparent that power means may be employed for the same purpose. An advantageous result is attained by use of a single movable baffle plate for varying the area of the opening between the vaporizing and combustion chambers, although the dual arrangement herein shown will be preferred in most cases.

A feature of advantage inherent in this invention is the simplicity of the few parts that combine together to make up the dual control. These parts may be installed for operation with many existing types of oil burners with little or no preparatory work being required. The fixed baffle plate, as shown, provides a mounting for the movable baffle plates, and in the usual float valve chamber the valve stem protrudes upwardly through its top whereon may be affixed the unitary support for both bell crank levers and their associated parts. The location of the controls thus provided may be at the front of the burner where they are most accessible and convenient for operation.

I claim:

1. For an oil burner having a vaporizing chamber open at its upper end, a combined baffle and oil supply means, said means comprising a baffle plate mounted adjacent said opening and adapted to swing down from a relatively vertical position at one side of said opening to a position partially closing the same to regulate the flow of vapor from said burner, an operating rod in connection with said baffle plate, a valve for regulating the supply of fuel to the burner, reciprocable operating means for said valve, a bell crank lever pivoted intermediate its ends adjacent said valve and having one arm proximate to the operating

rod for the baffle plate and the other arm engageable with the valve operating means, and a cam device on the operating rod engageable with one arm of the lever when the former is rotated to swing its associated baffle plate to down position, whereby it engages said arm to rock the bell crank and actuate the valve operating means toward its closed position.

2. For an oil burner having a vaporizing chamber open at its upper end, a combined baffle and oil supply means, said means comprising a baffle plate mounted adjacent said opening for movement from a position at one side thereof to a position partially closing the opening to regulate the flow of vapor from the burner, operating means for said baffle plate, a valve for regulating the supply of liquid fuel to the burner, a cam associated with the operating means to be moved thereby, and a pivotally mounted lever extending between the cam and said valve adapted to actuate the latter toward its closed position when said baffle plate is moved to a position to partially close the opening in the upper end of the vaporizing chamber.

3. For an oil burner having a vaporizing chamber open at its upper ends, a combined baffle and oil supply means, said means comprising a pair of baffle plates each mounted adjacent said opening for movement from a position at one side thereof to a position partially closing the same to regulate the flow of vapor from the burner, independent operating means for said baffle plates, a valve for regulating the supply of fuel to the burner, a cam associated with each operating means to be moved thereby, and a pivotally mounted lever extending between each cam and said valve, each lever adapted to actuate said valve toward closed position when the associated baffle plate is moved to a position to partially close the opening in the upper end of the vaporizing chamber.

4. For an oil burner having a vaporizing chamber open at its upper end, a combined baffle and oil supply means, said means comprising a pair of baffles each mounted adjacent said opening for movement from a position at one side of the opening to a position partially closing the opening to regulate the flow of vapor from the burner, independent operating means for said baffle plates, a valve for regulating the supply of fuel to the burner, a cam associated with each operating means to be moved thereby, a pivotally mounted lever extending between each cam and said valve, each lever adapted to actuate said valve toward closed position when the associated baffle plate is moved to a position to partially close the opening in the upper end of the vaporizing chamber, and a pair of adjustable stops, one engageable with each lever, adapted to limit the extent of motion transmitted thereby to said valve whereby one lever is restrained from actuating said valve a lesser distance toward its closed position.

5. For an oil burner having a vaporizing chamber open at its upper end, a combined baffle and oil supply means, said means comprising a baffle plate mounted adjacent said opening for movement from a position at one side of the opening to a position partially closing the same to regulate the flow of vapor from the burner, operating means for the baffle plate, a valve spring-actuated in one direction for regulating the supply of fuel to the burner, a cam associated with the operating means to be moved thereby, and motion-transmitting thrust means extending between the cam and said valve adapted to actuate the latter, counter to the tension of its spring, toward a closed position when said baffle plate is moved to a position to partially close the opening in the upper end of the vaporizing chamber.

6. For an oil burner having a vaporizing chamber open at its upper end, a combined baffle and oil supply means, said means comprising a pair of baffle plates each mounted adjacent said opening for movement from a position at one side thereof to a position partially closing the opening to regulate the flow of vapor from the burner, a valve spring-actuated in one direction for regulating the supply of fuel to the burner, independent operating means for the baffle plates, a cam associated with each operating means to be moved thereby, and unidirectional motion-transmitting means extending between each cam and said valve, each adapted to actuate the latter, counter to the tension of its spring, toward closed position when the associated baffle plate is moved to a position to partially close the opening in the upper end of the vaporizing chamber.

7. For an oil burner having a vaporizing chamber open at its upper end, a combined baffle and oil supply means, said means comprising a pair of baffle plates each mounted adjacent said opening for movement from a position at one side thereof to a position partially closing the same to regulate the flow of vapor from the burner, independent operating means for said baffle plates, a valve spring-actuated in one direction for regulating the supply of fuel to the burner, a cam associated with each operating means to be moved thereby, unidirectional motion-transmitting means extending between each cam and said valve, each of said motion-transmitting means adapted to actuate said valve, counter to the tension of its spring, toward closed position when the associated baffle plate is moved to a position to partially close the opening in the upper end of the vaporizing chamber, and a pair of adjustable stops, one engageable with each motion-transmitting means adapted to limit the extent of motion transmitted thereby to said valve, whereby one motion-transmitting means is restrained from actuating the valve a lesser distance toward its closed position.

8. For an oil burner having a vaporizing chamber open at its upper end, a combined baffle and oil supply means, said means comprising a pair of baffle plates each mounted adjacent said opening for movement from a position at one side thereof to a position partially closing the same to regulate the flow of vapor from the burner, a valve for regulating the supply of fuel to the burner, said valve having an operating head extending exteriorly of a housing therefor, a bracket unit mounted on said valve housing, a pair of levers mounted on the bracket unit and each provided with means engaging said valve head, operating means for each of the baffle plates, and a cam associated with each operating means to be moved thereby, each lever being engaged by one of the cams to be operated thereby when its associated baffle plate is moved to a position to partially close the opening in the upper end of the vaporizing chamber, whereby said valve is operated concurrently therewith.

9. For an oil burner having a vaporizing chamber open at its upper end, a combined baffle and oil supply means, said means comprising a pair of baffle plates each mounted adjacent said opening for movement from a position at one side thereof to a position partially closing the same to regulate the flow of vapor from the

burner, operating means for each of the baffle plates, a valve for regulating the supply of fuel to the burner, said valve having an operating head extending exteriorly of a housing therefor, a motion-transmitting operative connection extending from each operating means to the head of said valve, and motion-arresting means engaging with each operative connection to arrest movement thereof, one before the other, whereby the extent of said valve operation will be different in response to operation of the baffle plates.

10. For an oil burner having a vaporizing chamber open at its upper end, a combined baffle and oil supply means, said means comprising a pair of baffle plates each mounted adjacent said opening for movement from a position at one side thereof to a position partially closing the same to regulate the flow of vapor from the burner, a valve for regulating the supply of fuel to the burner, said valve having an operating head extending exteriorly of a housing therefor, a bracket unit mounted on said valve housing, a pair of levers mounted on the bracket unit, operating means for each of the baffle plates, a cam associated with each operating means to be moved thereby, a pair of bell cranks pivoted to the bracket unit and each extending therefrom into operative relation with one of the cams adapted to be rocked thereby when the associated baffle plate is moved to a position to partially close the opening in the upper end of the vaporizing chamber, means on each lever in separable engagement with said valve head adapted to operate the latter, and a pair of adjustable stops, one engageable with each lever adapted to limit the extent of motion transmitted thereby to said valve, whereby one lever is restrained from actuating the valve a lesser distance toward its closed position.

11. For an oil burner having a vaporizing chamber open at its upper end, a combined baffle and oil supply means, said means comprising a pair of baffle plates each mounted adjacent said opening for movement from a position at one side thereof to a position partially closing the same to regulate the flow of vapor from the

burner, a valve spring-actuated in one direction for regulating the supply of fuel to the burner, independent operating means for the baffle plates, and a pair of unidirectional motion-transmitting means, one extending between each operating means and said valve, each adapted to actuate the latter, counter to the tension of its spring, toward closed position when the associated baffle plate is moved to a position to partially close the opening in the upper end of the vaporizing chamber.

12. For an oil burner having a vaporizing chamber open at its upper end, a combined baffle and oil supply means, said means comprising a pair of baffle plates each mounted adjacent said opening for movement from a position at one side thereof to a position partially closing the same to regulate the flow of vapor from the burner, independent operating means for said baffle plates, a valve spring-actuated in one direction for regulating the supply of fuel to the burner, a pair of unidirectional motion-transmitting means, one extending between each operating means and said valve, and each in separable engagement with the latter adapted to actuate the valve, counter to the tension of its spring, toward closed position when the associated baffle plate is moved to partially close the opening in the upper end of the vaporizing chamber, and means for adjusting the range of movement of each motion-transmitting means, whereby to vary the extent of said valve operation.

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