

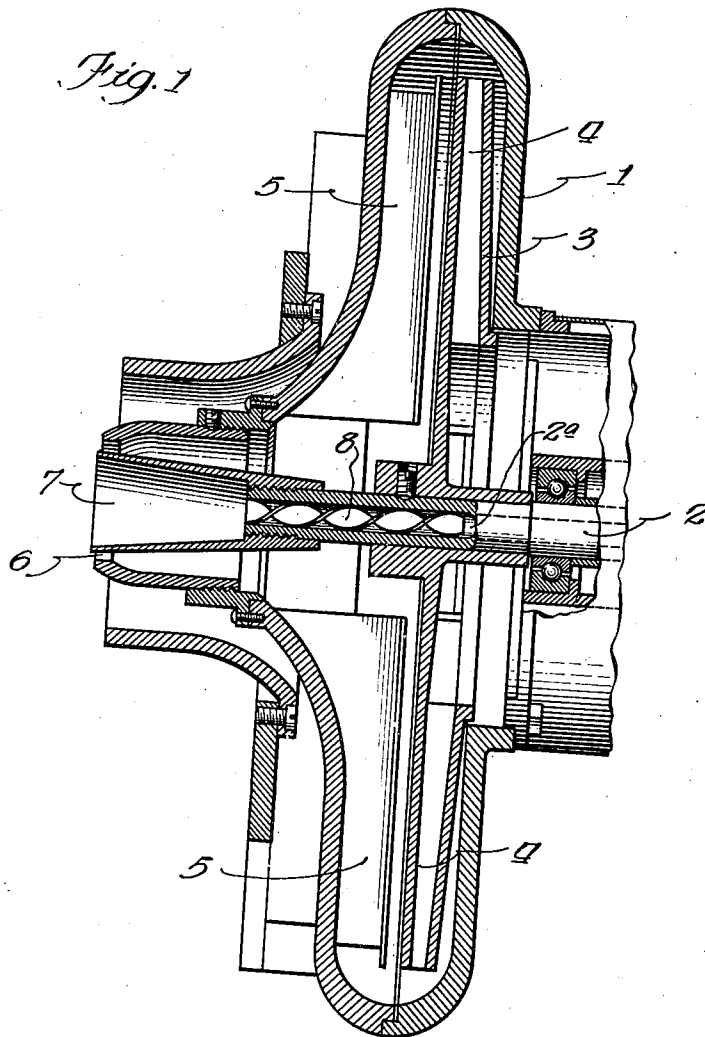
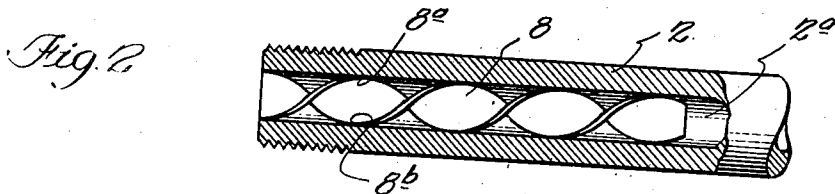
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OIL BURNER

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## UNITED STATES PATENT OFFICE

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## OIL BURNER

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## 1 Claim. (Cl. 158—77)

This invention relates to the control of liquid in a conduit through which it normally flows in horizontal direction and in which the flow is occasionally shut off. The invention is particularly concerned with means for wholly checking the flow when it is intentionally stopped so as to prevent the dripping of the liquid from the outlet end of the conduit.

One object of the invention is to provide means in a horizontal conduit which will permit the flow of liquid therethrough at any time under moderate pressure but will act to check such flow when the pressure is cut off.

Another object is to provide a form of dam for a horizontal flow passage which is adapted, without adjustment, to check the flow of liquid to the passage when substantially no pressure is applied thereto.

It is also an object of the invention to provide means to be fitted into a rotatable horizontal conduit for checking the flow of liquid therethrough when the conduit is at rest and no pressure is applied to the liquid.

More specifically, the invention is shown and described as applied to an oil burner in which the fuel oil is fed to the point of combustion through a horizontal conduit which is in a rotating member, and the object of the invention is to provide a dam in the bore of the shaft which prevents the dripping of oil therefrom when the pressure is shut off and the shaft is not rotating.

Other objects and advantages will appear as the description proceeds. The invention consists in certain features and elements of construction in combination, as herein shown and described and as indicated by the claim.

## In the drawing:

Figure 1 is a vertical axial section of a portion of an oil burner showing this invention applied thereto.

Figure 2 is an axial sectional view of the oil feed conduit of the oil burner taken on a larger scale.

For illustrating one application of this invention the drawing shows a portion of an oil burner having a housing 1 in which there is journaled a shaft 2 which is hollow so as to serve as a conduit for feeding oil to the point of combustion. The shaft is rotated by a motor, not shown, and within the housing 1 the shaft carries the rotor 3 of a centrifugal air pump or blower having outwardly extending passages 4 for the air. Air which is thus discharged under pressure travels between the vanes 5 toward the central portion of the housing and is fed from an annular orifice 6 which surrounds the flared outlet 7 secured

to the end of the horizontal shaft 2. Thus the oil which is fed through the shaft 2 is thrown outwardly by centrifugal force at the outer end of the part 7 and is then intermingled with the air issuing from the annular opening 6. Suitable pumping means, not shown, serves to feed the oil through the horizontal bore of the shaft 2, but when the apparatus is shut down, as occurs frequently in the operation of an automatic oil burner under thermostatic control, the pumping means ceases to operate and in some cases an automatic valve is employed to insure that the flow of oil through the hollow shaft 2 shall stop. At the same time, the blower ceases to discharge air under pressure at the opening 6 and combustion is temporarily arrested. However, since there is always a small quantity of oil left in the flow passage through the shaft 2, if this passage is even slightly inclined toward the outlet end, such oil will gradually flow into the flared terminal 7 and will tend to drip therefrom onto the heated surfaces of the combustion chamber where it may not burn but will create smoke and cause a disagreeable odor. This is one situation in which it is desirable to wholly arrest the flow of liquid in a horizontal conduit when the pressure has been shut off.

In the structure illustrated the outlet end of the hollow shaft 2 has its bore 2<sup>a</sup> fitted with a twisted strip of flat stock, shown at 8, and, preferably, this is simply a parallel-sided strip of steel or other metal twisted so that its oppositely helical edges 8<sup>a</sup> and 8<sup>b</sup> fit snugly against the cylindrical wall of the bore in the shaft 2. Thus a drop of liquid flowing along the bottom of this cylindrical wall 2<sup>a</sup> will be retarded by the obliquely trending, warped surfaces of the twisted member 8, and will be deflected thereby. But if the axis of the bore 2<sup>a</sup> is substantially level, and there is no pressure behind the liquid to advance it, the drop or other small quantity thus arriving at the twisted member 8 will be unable to climb along the inclined edge of this member which follows a helical course around the surface of the bore 2<sup>a</sup>. Hence, the member 8 will act as a dam to hold back any small accumulation of liquid in the bore 2<sup>a</sup> until pressure is applied or the shaft 2 begins to rotate.

Preferably, the member 8 is twisted in a direction such that it will act as a feed screw to assist the advance of liquid in the bore of the shaft toward the outlet when the shaft 2 is rotated in its normal direction; it will be understood that the pressure of the pumping means, not shown, is relied upon for feeding oil to the point of com-

bustion, but by twisting the member 8 in the proper direction it is prevented from setting up a back pressure which would oppose the flow of oil in the feeding direction, and the small cross-section of the twisted member 8 avoids materially reducing the capacity of the flow passage.

It will be evident that the same expedient may be useful in other situations and mechanisms in which liquid flows horizontally to an outlet, and it is desirable to prevent dripping of the liquid when its flow is shut off at some distance back from the outlet. It will also be recognized that the twisted or volute strip will not necessarily have both its edges in contact with the cylindrical wall of the flow passage, although that arrangement, as illustrated in the drawing, is perhaps the simplest to manufacture and the most effective for the purpose. Thus it will be manifest to those skilled in the art that various modifications and rearrangements of the structure may be made without departing from the spirit and scope of the invention, and that the same is not limited to the particular form herein shown

and described, except in so far as indicated by the appended claim.

I claim as my invention:

5 In an oil burner having a member which rotates in a predetermined direction when the burner is operating, said member having an oil feed passage extending horizontally to a constantly open unobstructed outlet which discharges to a combustion chamber and said  
10 passage including a cylindrical bore at the axis of rotation of said member, a twisted strip of flat stock secured in said bore with at least one of its helically formed edges in oil-tight contact with the wall of said bore whereby said strip  
15 acts to check the flow of liquid along the lower side of the bore when the member is not rotating, said strip being twisted in a direction to facilitate the flow of liquid through the bore toward the  
20 outlet when the member is rotated in the said predetermined direction, and said strip constituting the sole obstruction in the passage.

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