

CHAPTER 16

Rotary Oil Burners

By definition, a rotary burner is *one which employs a rotating element to generate centrifugal force to project the fuel oil*. The oil is introduced under low pressure (gravity feed) instead of high

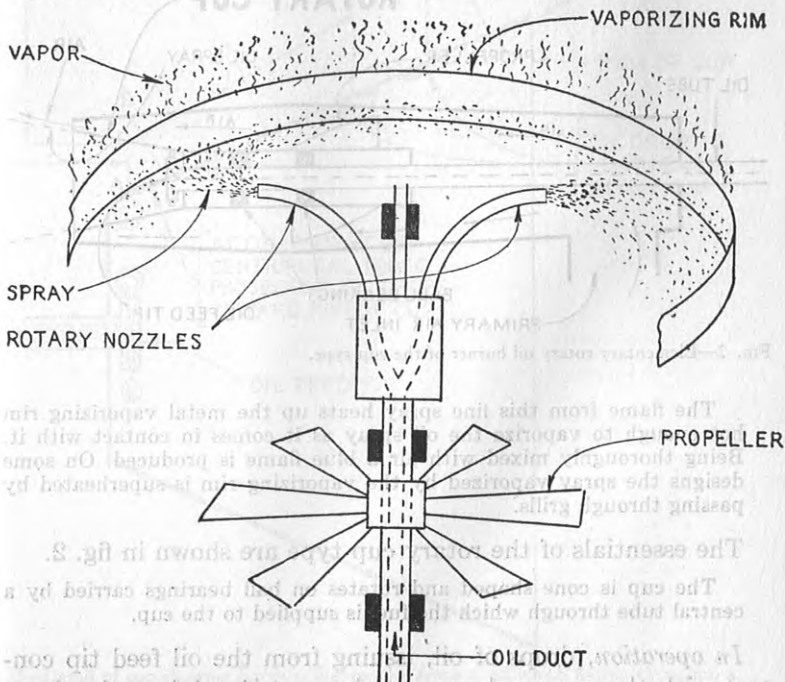


FIG. 1—Elementary rotary oil burner of the nozzle type.

pressure as with the high pressure sprayer burners.

There are two basic types:

1. Rotary nozzle.
2. Rotary cup.

The essentials of the rotary nozzle type are shown in fig. 1.

Air pressure acting on the propeller causes the nozzle assembly to rotate at a very high speed. Oil is supplied through the hollow shaft to the nozzles and the rotary motion causes the oil to be thrown off in a fine spray by centrifugal force.

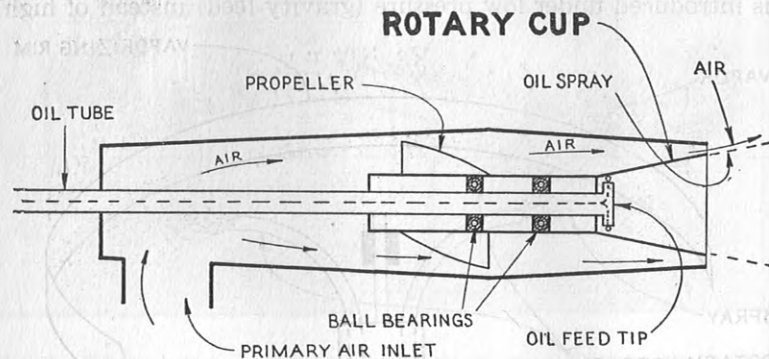


FIG. 2—Elementary rotary oil burner of the cup type.

The flame from this fine spray heats up the metal vaporizing rim hot enough to vaporize the oil spray as it comes in contact with it. Being thoroughly mixed with air a blue flame is produced. On some designs the spray vaporized by the vaporizing rim is superheated by passing through grills.

The essentials of the rotary cup type are shown in fig. 2.

The cup is cone shaped and rotates on ball bearings carried by a central tube through which the fuel is supplied to the cup.

In operation, drops of oil, issuing from the oil feed tip contact with the cup as shown and by centrifugal force the drops

are both flattened into a film and projected toward and off the rim of the cup.

The rim being surrounded by a concentric opening of the casing, the oil is met by the surrounding blast of primary air with which it mixes giving the proper mixture for combustion.

The action of the fast rotating cup is shown in detail in fig. 3.

Here, the oil is shown coming out of the feed tip in drops. One

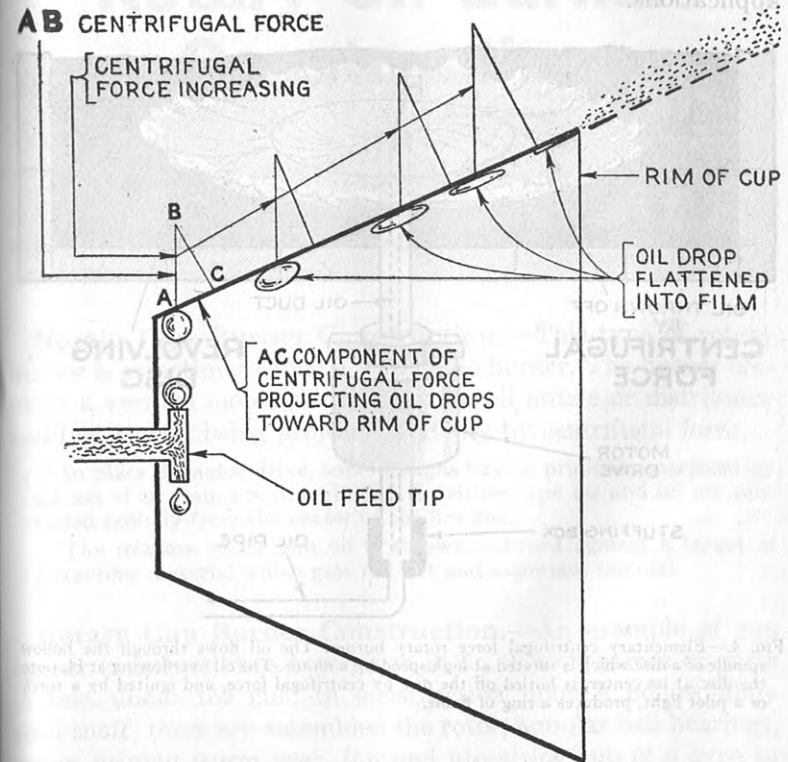


FIG. 3—Detail of cup showing forces acting on the drops of oil which flatten them into a film and project them toward and off the rim.

drop is shown touching the cup at A. It is given a rotary motion by the cup centrifugal force which causes it to press against the cup.

Let AB = the centrifugal force. Draw perpendicular BC , then AC , is the component of the centrifugal force which projects the oil drop toward and off the cup rim.

The component BC , of the centrifugal force AB , causing the oil drop to press against the cup, flattens it into a film during its progress toward the rim as shown.

Rotary cup burners are used both in domestic and industrial applications.

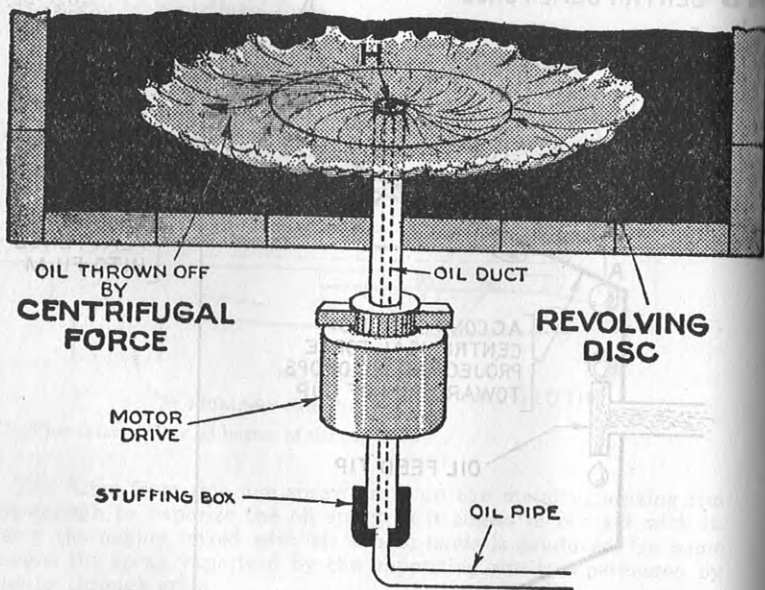


FIG. 4.—Elementary centrifugal force rotary burner. The oil flows through the hollow spindle of a disc which is rotated at high speed by a motor. The oil overflowing at H, onto the disc at its center, is hurled off the disc by centrifugal force, and ignited by a torch or a pilot light, produces a ring of flame.