the rotary filling machine designated generally by the reference numeral **72**.

The bottles or containers **33** to be filled are fed to the filling machine **72** by a conventional conveyor and directed by a conventional feed star (not disclosed) in spaced relation onto the filler bed **52** of the rotating machine. On this filler bed each container is disposed beneath and aligned with an elevated filling tube unit and filling tube head **38** (see dotted outline in FIG. 1) both carried by the rotary filling machine, and these containers of a predetermined capacity filled by its filling tube **13** during each revolution of the machine. To raise and lower the filling tube units and filling tube heads **38** and direct the filling tube of each unit into a container **33** to be filled, its filling tube head **38** is carried over the stationary elevated cam track **39** and in following the contour of the stationary cam track each filling tube head and its depending filling tube and filling tube unit is lowered for filling and elevated when filling has been accomplished, and when lowered the filling tube **13** enters the neck of a container and fills it to a predetermined depth, then is elevated and withdrawn from the filled container which continues in its travel upon the filler bed **52** until it is directed from the filler bed by a discharge star onto a discharge conveyor for delivery to sealing apparatus (not shown). Each filling tube head and filling tube unit is of substantial weight and thus closely follows the contour of the cam track which is sufficiently steep to effectively seal each bottle as the filling tube **13** is lowered into the bottle.

In the operation of the filler tube assembly the wine or liquid to be bottled is sealed against flow as shown in FIG. 5 until the filling tube unit is lowered over the empty container and the resilient sealer or sealing collar **31** seats upon the open upper end of the neck **32** of the bottle **33**. As the filling tube **13** is movable vertically and relative to the encompassing parts in the centering bell housing **10**, it continues its downward movement whereupon the cylindrical portion **48** of the tip **49** on the lower end **13a** of this filling tube is withdrawn from the lower end of the encompassing tube **27**, thereby breaking the seal effected by the O-ring and uncovering the outlet ports **47** (FIG. 4). Wine or liquid in a relatively small quantity but sufficient to cover these ports **47** when the tip **49** and filling tube **13** are lowered to adjacent the bottom of the bottle flows from the outlet ports **47**.

This initial flow is caused by the static head which tends to gently force the liquid outwardly through the ports **47** against the inner wall of the bottle from where the wine flows downwardly and collects in the bottom. This static head which results in initial flow is dissipated as the air in the bottle sealed to the atmosphere is being forced upwardly through the annular space between the filling tube **13** and encompassing outer tube **27**, into the space **26** and out through the nipple **22** and the relatively small internal diameter flexible return hose **23**, through the discharge pipe **24** and out through the orifice **24a** into the annular collecting space **71** in the tank or reservoir **25**.

The restricted return hose **23** is raised and lowered with the filling unit and this hose and the larger tube **13** function as a U-tube, with the level of the liquid collected in the smaller or restricted hose dropping as one end of this hose is lowered with the filler assembly, its other end being retained above the liquid level in the tank.

The initial flow from the filling tube **13** begins when this tube and the filling tube unit have been lowered upon a bottle, as shown in FIG. 4, and the lower end of the depending filling tube is forced downwardly by the filling tube head **38** out of the lower end of the encompassing tube **27** to expose the discharge ports **47**. At such time the lower end of the tube **27** is also open for the discharge of the entrapped air. As the entrapped air in the bottle is relieved before the main flow of the gravity fed liquid commences and this air with any entrained liquid can only be relieved through the restricted annular passage between the concentric tubes **13** and **27** and through the restricted opening in the return hose **23**, there is a time lag between the initial flow and the main flow while the entrapped air is relieved.

Before the main flow through the filling tube **13** and the outlet ports **47** of the tip **49** begins, the air in the bottle must be removed. In such removal the static head through the filling tube **13** forces some wine upwardly through the reduced annular column in the outer tube **27** through which escapes collected air. In the filling operation this time lag in which the collected air is dissipated through this reduced annular column or space in the outer tube **27** and through the small internal diameter of the flexible return hose **23** requires approximately one second which is sufficient to permit the tip **49** to reach approximately the bottom of the bottle **33** whereupon the main flow from the filling tube **13** commences.

This bottom flow of the wine in the filling operation is highly important to prevent turbulence and the entrainment of air in dry wines.

In one commercial embodiment of the present invention, two hundred and twenty-five bottles are filled per minute with the rotary filling machine provided with forty-five filling tubes so that the rotary filler bed **52**, the filling tube heads **38** and filler tube units with the filler tubes **13** make five revolutions each minute. In this embodiment, the filling operation for forty-five bottles requires a maximum of twelve seconds to complete, including approximately one second required to move each bottle to filling position, approximately one second to lower the filling tube, the filling tube is maintained lowered for approximately four seconds, approximately four seconds is required to slowly raise the filling tube into the encompassing outer tube **27** and complete the filling operation, approximately one second to completely withdraw the filling tube from the bottle and approximately one second to withdraw or remove the filled bottle. The lag period between the initial flow and before the main flow commences is between one and two seconds.

In this commercial embodiment the filling tube **13** has an internal diameter of approximately $^{25}/_{64}$ inch and an external diameter of approximately ½ inch. Due to the enlarged internal diameter of the cylindrical portion **48** of the tip **49** over that of the internal diameter of the filling tube **13**, the velocity of the liquid flow into the bottle being filled is maintained low. The inner diameter of the flexible return hose **23** which connects with the annular space between the filling tube **13** and the encompassing outer tube **27** is approximately $^{3}/_{16}$ inch and thus substantially smaller than the filling tube **13**.

Having thus disclosed the invention, I claim:

1. In a rotary filling machine for bottling liquids such as dry wines with a minimum of entrained air, a resevoir for receiving and supplying the liquid to be bottled in said machine, an inlet, a conduit rising from said inlet and connected to the base of said reservoir for vertical flow upwardly into said reservoir, said conduit having stepped enlargements to decrease the velocity and turbulence of the liquid entering said reservoir, a collecting chamber encompassing but separated from said conduit the liquid flowing by gravity from said collecting chamber for bottling, and baffles provided in said reservoir for directing the entering liquid in a tortuous path to said collecting chamber whereby the liquid in said collecting chamber is in a quiescent state and substantially free of entrapped air.

2. In a rotary filling machine for bottling liquids such as dry wines with a minimum of entrained air, a reservoir for receiving and supplying the liquid to be bottled in said machine, an inlet, a conduit rising from said inlet and provided with stepped enlargements connected to the bottom of the reservoir for decreasing the velocity and turbulence of the entering liquid, a collecting chamber in the base of said reservoir but separated from said inlet for receiving the liquid in a quiescent state, and baffles in