ABSTRACT OF THE DISCLOSURE

Improvements in the mounting of well tubing the, mounting members being supported in a cavity of a body member at different vertical positions in spaced relation to each other. Radial passages in the body member communicate the exterior with the space between the mounting members. The innermost tubing passes through a seal in the upper mounting member and the upper end is connected directly to an opening in the body member.

This invention relates to well pressure apparatus and it is more particularly concerned with improved means for mounting tubing in a well head.

In U.S. Patent No. 3,151,680, there is described apparatus for mounting well tubing by means of a lower hanger supported by an upwardly facing shoulder and an upper concentric hanger supported on the lower hanger and so devised as to provide an annular inner manifold between the adjacent faces of the hangers. This manifold communicates with exterior discharge pipes by means of ducts passing through the lower hanger.

The present invention comprises improvements in such prior apparatus which simplify the structure by eliminating certain elements and rearranging the remaining elements. The means of supporting the hangers in the body member is also simplified. The resulting improved apparatus is simple in construction, easier to assemble and results in improved operating characteristics.

The invention generally comprises a body member adapted to be supported on the upper end of the outer casing of the well. It has a vertical opening, a portion of which has an inverted frusto-conical configuration forming a wall surface. An upper partition of septum and a lower tube hanger are mounted in the opening each having central openings and outer configurations conforming each to a different vertical portion of the wall surface. The septum and hanger are supported on the wall surface in coaxial spaced relation to each other. An outer well tubing is connected to and supported by the tubing hanger, while an inner tubing passes through a packing gland of the septum and is supported by a tubing hanger above the septum. Ducts extend through the wall of the body member radially from points in the space between the septum and the lower hanger to the exterior of the body member.

Other features and advantages of the invention will appear more fully from the following description taken in conjunction with the accompanying drawing which illustrates an embodiment of the invention.

In the drawing:

FIG. 1 is a vertical sectional view through the well head body and pertinent parts associated therewith along the line 1—1 of FIG. 4.
FIG. 2 is a vertical sectional view along the line 2—2 of FIG. 4.
FIG. 3 is a foreshortened vertical sectional view along the line 3—3 of FIG. 4.
FIG. 4 is a top plan view of the embodiment.
FIG. 5 is a sectional view along line 5—5 of FIG. 2.
FIG. 6 is a vertical sectional exploded view of the principal parts of the embodiment on a smaller scale.
end of the outer casing, said body member having a vertical opening axially therethrough, said opening having inverted frustoconical configurations forming corresponding wall surfaces, an upper septum and a lower tubing hanger mounted in said opening, said septum and hanger having each central openings therethrough and outer configurations conforming each to a different vertical portion of the wall surface, said septum and hanger being directly supported on said surfaces in vertically spaced relation to each other, tubular connection means associated with each of said septum and hanger, said septum and hanger being in coaxial relation to each other, and ducts extending through the wall of the body member radially from points in the space between the septum and hanger to the exterior of the body member.

2. Improved well apparatus as defined by claim 1 and a packing gland carried by the septum for engaging tubing to be connected thereto.

3. Improved well apparatus as defined by claim 1 in which the body member comprises an upper section and a lower section, means for removably securing said sections together, said upper section having an outlet opening and means associated with the opening for connecting well tubing thereto.

4. The combination with an outer well casing of a body member attached to and supported on the upper end of the casing, said body member having an upper section and a lower section secured together, said lower section having an inverted frusto-conical opening axially therethrough forming a wall surface of corresponding configuration, an upper septum and a lower tubing hanger mounted in said opening, said septum and hanger having each central openings therethrough and outer configurations conforming each to different vertically spaced portions of the wall surface, said septum and hanger being abuttingly engaged with and supported by the portions of the outer wall surface in vertically spaced relation to each other, outer tubing connected to the hanger in communication with the central opening therethrough, inner tubing coaxially disposed in the outer tubing connected to the septum and to the upper section of the body member, and ducts extending radially through the wall of the body member from points in the space between the septum and hanger and extending to the exterior of the body member, said upper body section having an opening in communication with the inner tubing.

5. The combination as defined by claim 4 and a packing gland between the septum and the inner tubing, said tubing passing through the gland and having its upper end attached to the opening of the upper body section.

6. Well apparatus comprising a body member adapted to be attached to and supported on the upper end of the outer casing of a well, said body member having a vertical opening axially therethrough, separate upper and lower means tubing hangers in said opening for supporting inner and outer tubings of the well, and a septum in the opening between said upper and lower tubing hanger, said septum having a vertical opening in which the inner tubing is disposed, said septum opening having a packing gland engaging said inner tubing, said septum and lower tubing hanger being removably supported in the vertical opening at different elevations, said vertical opening having two inverted frusto-conical configurations of different sloping sides, one for the septum and one for the lower hanger, said septum and lower hanger having corresponding outer surface configurations to react on the said inverted frusto-conical configurations of the vertical opening.

7. Well apparatus as defined by claim 6 and releasable means for holding the lower tubing hanger in its seated position relative to its corresponding configuration of the vertical opening.

8. Well apparatus as defined by claim 6 in which the septum is held in its seated position relative to its corresponding configuration of the vertical opening by contact with a removable upper part of the body.

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