

Aug. 17, 1937.

L. K. MADELY

2,090,213

WELL SEAL

Filed Nov. 25, 1936

Fig. 1.

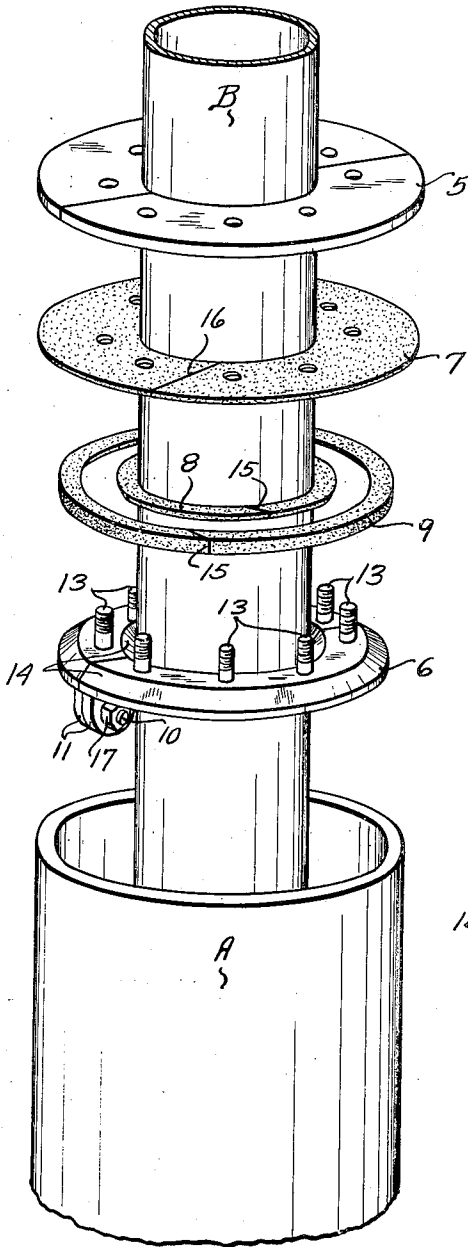


Fig. 2.

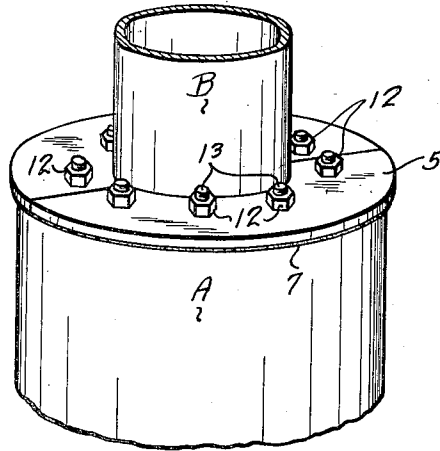
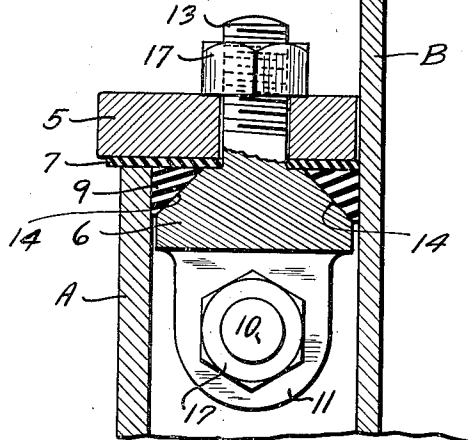


Fig. 3.



INVENTOR.

LEE K. MADELY

BY

Foy M. Liles

ATTORNEY.

UNITED STATES PATENT OFFICE

2,090,213

WELL SEAL

Lee K. Madely, Chicago, Ill., assignor to Fairbanks, Morse & Co., Chicago, Ill., a corporation of Illinois

Application November 25, 1936, Serial No. 112,673

5 Claims. (Cl. 285—22)

This invention relates to improved means for sealing wells to prevent contamination thereof by the entrance of foreign material or liquids at the upper or head end of the well, and an object of the invention is attained in the provision of an improved seal which forms a water-tight joint between the discharge or pump column and the upper extremity of the well casing member.

The object of the invention, generally, is to provide an improved well seal of the character and for the purpose described which is simple and economical of manufacture, which may be readily applied to the well members without disturbing previously installed pumping or other equipment, and which in all other respects is highly suitable for its intended purpose.

In the accompanying drawing, Fig. 1 is an exploded view showing the component parts of the improved seal arranged on the well members; Fig. 2 shows the upper end of the casing member with the seal structure applied thereto, and Fig. 3 is a fragmentary, sectional elevation showing the manner in which the elements are assembled to cap and seal the opening at the upper end of the casing.

Referring now by characters of reference to the drawing, A designates the upper end of the tubular casing member which lines the well bore. In some installations casing A projects a short distance above the ground level, and in others the casing terminates in a pit below, but close to the surface of the ground. B indicates the discharge or pump column which extends from the pump downwardly through the casing.

The seal structure embodying the present invention serves to close and render water-tight the annular opening between the upper end of the casing and the pump column. Described generally, the seal comprises a pair of annular plates 5 and 6 between which plates are disposed a flat annular gasket member 7, and a pair of packing bands or cords 8 and 9. The plates are adapted to be drawn together by means of threaded elements to compress the packing cords into tight, sealing engagement with the casing and pump column.

The upper and lower ring plates 5 and 6 are rigid metal members split diametrically to facilitate their application to previously installed well conduits. The upper plate 5 is adapted to fit closely around the pump column B and project laterally over the end of casing member A. The lower plate 6 is dimensioned to fit snugly within the annular space between the tubes A and B,

and the paired sections of plate 6 are rigidly secured together by means of bolts 10, (only one thereof appearing), which extend transversely through integral lugs 11 at the under side of the plate adjacent the mating ends of the sections. The plates 5 and 6 are adapted to be drawn together by means of nuts 17 on studs 13 which are anchored in the lower plate and extend through openings in gasket 7 and upper plate 5.

The inner and outer peripheral margins at the upper surface of plate 6 are chamfered, as indicated at 14, to provide angularly sided grooves or seats to accommodate the packing rings 8 and 9. The packing rings 8 and 9 are preferably made of pure gum rubber, and to facilitate placing them about the inner pipe B, the rings are cut diagonally as indicated at 15 so that the junction of their overlapping ends will be water-tight.

The gasket 7, located above packing rings 8 and 9 and between the plates 5 and 6, comprises a flat annulus of appreciable thickness and may be formed of any of the materials customarily employed for gaskets used in connection with fittings for water pipes. The member 7 corresponds in size to that of the upper plate 5 and its outer marginal portion is adapted to be compressed between the plate 5 and the upper end of casing member A. The gasket 7 is provided with a diagonal, radially extending cut 16, in the manner of, and for the same purpose as the cuts 15 in the packing rings 8 and 9.

It will now appear that the described sealing structure may be assembled on the well members with the upper plate 5 and gasket 7 seated on the end of the casing member A, and the lower plate 6 and packing rings disposed within and spaced slightly below the upper end of the casing. As the nuts 12 are tightened, the lower plate 6 is drawn upwardly, compressing the packing cords and expanding them laterally into water-tight, sealing engagement with the casing A and pump column B. In this manner the lower plate becomes effectually locked to the well columns, and further tightening of the nuts 12 tends to clamp the gasket 7 solidly between the plates, and between the upper plate and end of the casing.

It will appear that the described device provides a double seal to exclude liquid or other material from the upper end of the well casing. In the first instance, materials tending to enter the casing at the joints of the upper plate sections, or through the juncture of the upper plate and the end of the casing, are met by the plate

gasket 7. The principal seal afforded by the packing rings 8 and 9 completes, and renders absolute the sealing function of the device.

Having described my invention, what I claim is:

- 5 1. A closure assembly for the upper end of a well casing comprising a pair of diametrically sectioned annular discs, one thereof having beveled inner and outer circumferential margins to accommodate packing rings, a flat annular gasket between said discs, packing rings on said 10 beveled margins, adjacent said gasket, and threaded elements adapted to draw said discs together to compress said gasket and packing rings.
- 15 2. In combination with the casing member and discharge column of a well, a closure assembly for the upper end of the casing member comprising an upper annular disc overlying the end of the casing member, a lower annular disc disposed within the mouth of the casing member, 20 the upper edges of said lower disc being chamfered to form inner and outer circumferential grooves, packing rings disposed in said grooves, and means for drawing said discs together to force said packing rings into sealing engagement 25 with the casing member and discharge column.
- 30 3. In combination with the casing member and discharge column of a well, a closure assembly for the upper end of the casing member comprising a lower annular disc situated within the mouth of the casing member, an upper annular disc overlying the end of the casing member and said lower disc, said lower disc having its upper peripheral margins chamfered to provide packing 35 seats, packing rings disposed in said seats,

and means for drawing said discs together to force said packing rings into sealing engagement with the casing member and discharge column.

4. In combination with the casing member and discharge column of a well, a seal comprising 5 upper and lower annular discs surrounding the discharge column and extending to the casing member, the upper circumferential margins of said lower disc being chamfered to provide seats for packing rings, a flat annular gasket substantially coextensive with the upper disc, disposed 10 between said discs, packing rings on said seats, underlying said gasket, and means for drawing said discs together to force said packing rings into sealing engagement with the casing member 15 and discharge column.

5. In combination with the casing member and discharge column of a well, a seal comprising a diametrically sectioned lower annular disc adapted to fit snugly within the casing member, 20 lugs depending from said disc and bolts extending through said lugs for securing the disc sections rigidly together, threaded studs projecting upwardly from the upper face of said disc, 25 the upper circumferential margins of said disc being beveled, packing rings disposed on the beveled surfaces of said lower disc, a flat annular gasket projecting over the end of the casing member, above the disc and packing rings, an upper, 30 diametrically sectioned annular disc, substantially coextensive with, and mounted over said gasket, said gasket and upper disc having apertures to receive said studs, and nuts threaded on said studs for drawing the discs together.

LEE K. MADELY. 35