Oct. 15, 1935. C. C. HEETER 2,017,717

STUFFING BOX CASING HEAD

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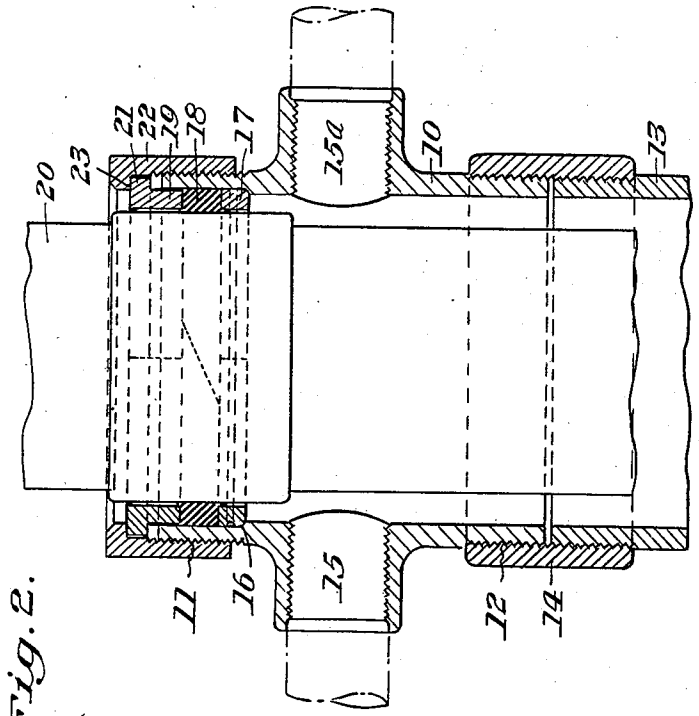


Fig. 2.



Fig. 4.

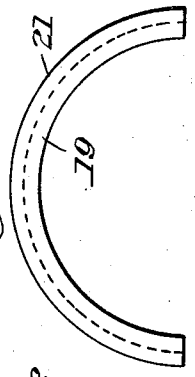


Fig. 3.

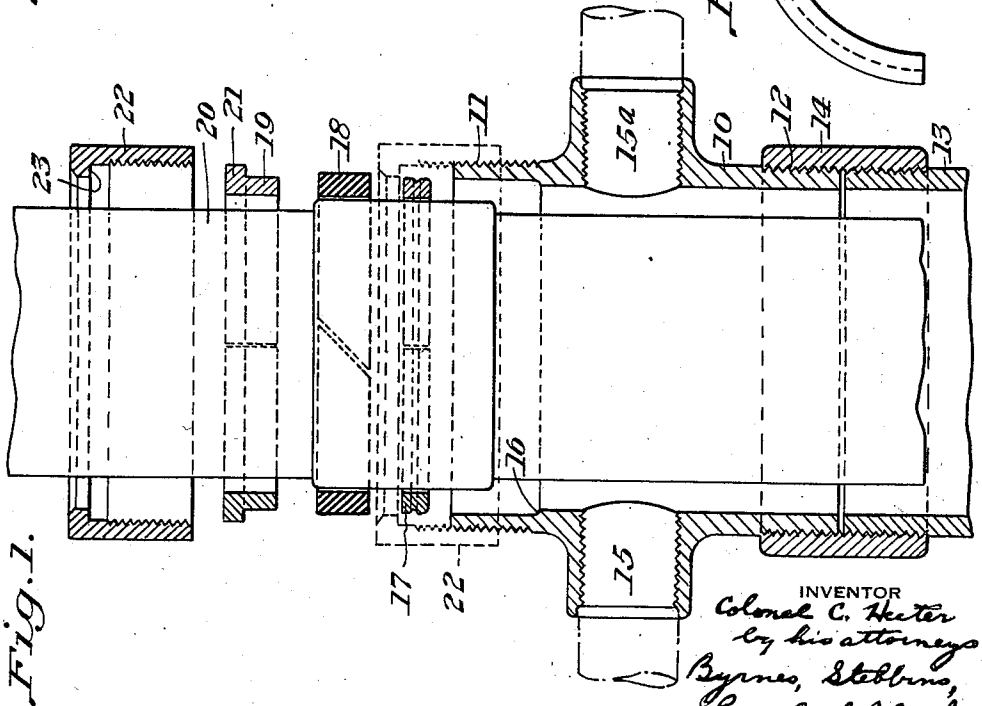


Fig. 1.

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STUFFING BOX CASING HEAD

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2 Claims. (Cl. 166—14)

My invention relates to a stuffing-box casing head, in particular, to a casing head for gas wells.

Several types of stuffing-box casing heads have been known heretofore closing the space between the upper end of an outer well casing and an inner casing. The most common type of prior art head is that embodying split cast iron construction. The installation of this type of casing head involves practically no difficulty. After the inner casing is lowered to the desired depth, the casing head is merely placed around the two casings and bolted together, while the inner casing is either suspended by the elevators or is permitted to rest on the bottom of the well. The objections to this type of head, however, are that it is very heavy, quite costly, and involves some difficulty in assembly, since the two parts of the split head must be accurately alined prior to bolting together. These objections have caused the industry to demand tubular steel casing heads.

Steel casing heads of tubular form are characterized by ample strength for all practical purposes and by a weight and cost much less than those of the older type of split cast iron head. The usual method of using the steel head is to lower the inner casing into the outer casing, rest it on the bottom of the well, disconnect the elevators from the inner casing, and attach the tubular casing head to the outer casing. The suspension for the inner casing is then reattached to the elevators and the inner casing raised to the desired level before the space between the inner casing and the outer casing is finally closed by a packing gland.

The tubular steel casing head has proved quite satisfactory for certain installations. With the increasing depth of present day wells, however, it has become impractical to use this type of casing head because it is not safe to rest the long strings of inner casing on the bottom of the well because of the danger of collapsing the inner casing by its own weight. The inner string must be suspended from the elevators at all times and this fact makes it impossible to apply the previous type of tubular steel casing head with continuous packing to the top of the outer casing after the inner casing has been lowered.

I have invented a tubular steel casing head designed particularly for deep wells where the inner casing must be permanently suspended. In accordance with my invention, I provide a tubular steel casing head having a port intermediate its ends, the lower end of the head being adapted for attachment to the upper end of the outer casing. A gasket-compressing ring is threaded on to the upper end of the head. The head is attached to the outer casing before the inner casing is lowered and the inner casing descends through the casing head and gasket-compressing ring. After the inner casing has been lowered to the desired depth, the gasket-compressing ring is removed and split packing elements are disposed about the inner casing within the casing head. As the gasket-compressing ring is screwed home, the packing is compressed into engagement with the inner casing.

For a complete understanding of the invention, reference is made to the accompanying drawing illustrating a present preferred embodiment. In the drawing:

Figure 1 is a vertical, axial, sectional view showing the parts of the packing gland in spaced relation in order of their application to the casing head;

Figure 2 is a similar view showing the parts in assembled relation;

Figure 3 is a plan view of one of the packing elements; and

Figure 4 is a similar view of another of the packing elements.

Referring now in detail to the drawing, the invention comprises a short section of steel tube 10 having its ends threaded as at 11 and 12. The lower end of the head is attached to the upper end of an outer casing 13, for example, by a coupling 14. Radial ports 15 and 15a are provided intermediate the ends of the tubular member 10. The ports are preferably formed by welding nipples into suitable holes in the wall of the tube 10.

An internal annular shoulder 16 is formed in the tube 10 adjacent its upper end. The shoulder 16 provides a seat for a split two-part, gasket-supporting ring 17. A compressible gasket ring 18 is adapted to rest on the ring 17. A split gland ring 19 is provided for applying downward pressure to the gasket ring to compress the latter and cause it to engage an inner casing indicated at 20 to form a gasket-tight joint therewith. The gland ring has an out-turned flange or shoulder 21 adjacent its upper edge which overhangs the upper end of the tube 10 when in position thereon. A gasket-compressing ring 22 is threaded internally for cooperation with the threaded upper end 11 of the tube 10. The ring 22 has an inturned shoulder or flange 23 adjacent its upper end. The shoulder 23 overhangs the shoulder 21 of the gland ring and the upper end of the tube

10 when screwed thereon. Figures 3 and 4 illustrate one half of the split gland ring and gasket-supporting ring.

It will be apparent that when the parts are in the position shown in Figure 2, the gasket-compressing ring 22, on being screwed home, by the engagement of the flanges 21 and 23, causes the gland ring 19 to exert sufficient pressure on the gasket 18 to force the latter into close contact with the periphery of the inner casing 20.

In the application of the device, the tube 10 is first attached to the top of the outer casing 13 and the ring 22 is partially screwed on to the upper end, as shown in dotted lines in Fig. 1, the gasket, its supporting ring and the gland ring being removed. The inner casing 20 is then lowered through the ring 22 and the tube 10 to the desired depth, being supported by the elevators at all times. When the inner casing has been properly positioned, the ring 22 is unscrewed and raised sufficiently to permit introduction of the two halves of the gasket-supporting ring 17. The halves of the ring 17 have an external, peripheral groove therein. After the two halves have been pressed together abutting the inner casing, they may be held in assembled relation by tying a cord therearound, the cord lying in the external, peripheral groove. When the ring 17 is properly seated on the internal, annular shoulder 16 adjacent the upper end of the tube 10, the gasket ring 18 is placed thereon. The two halves of the gland ring are then placed on the gasket ring. The ring 22 is lowered and screwed on to the upper end of the tube 10. As previously explained, the engagement of the inturned flange 23 on the ring 22 with the out-turned flange 21 on the ring 19, forces the latter into engagement with the gasket as the ring 22 is screwed home, to compress the gasket into gasket-tight engagement with the inner casing 20.

It will be apparent from the foregoing description that the invention is characterized by numerous advantages over the stuffing-box casing heads known to the prior art. The invention has the desirable characteristics of previous tubular steel casing heads in that it is light in weight and low in cost compared to the old split type of cast iron head. It has the further advantage that the inner casing string need not be rested on the bottom of the well to permit the application of the head to the outer casing. As already pointed out, this is of great importance in view of the increasing depth to which wells are being drilled, and the fact that it is not safe to rest the entire weight of the inner casing string on the lower sections thereof. The invention, therefore, is applicable in many cases where the previous structures could not be used.

Although I have illustrated and described herein but one preferred embodiment of the invention, it will be obvious that changes in the construction disclosed may be made without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. In a casing head, a tubular section adapted to make threaded connection with an outer casing, and dimensioned to receive a suspended inner casing string with its couplings, a gasket adapted to seat in the head, a gland adapted to engage the gasket, said gasket and gland being split to permit their installation while maintaining the inner casing suspended, and a clamping ring engaging the gland and threaded onto the section, the gasket and the gland having inside diameters sufficient to pass said inner casing and its couplings.

2. A stuffing-box casing head comprising a tube having a port intermediate its ends, the lower end of the tube having means for attachment to an outer well casing, a gasket-supporting ring seated within the tube, means projecting inwardly of the tube for supporting the ring therein, a gasket positioned on the ring, a gland ring superposed on the gasket and having means projecting outwardly thereof, and a gasket-compressing ring screwed directly onto the upper end of the tube, the gasket-compressing ring having means projecting inwardly for engaging the outwardly projecting means on the gland ring for forcing the latter against the gasket as the gasket-compressing ring is screwed onto the tube, to cause the gasket to engage an inner well-casing extending through the tube, said gland ring being of sufficient diameter to pass said inner casing and its couplings.

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