Jan. 1, 1946. J. E. HALL 2,392,145

CEMENT BASKET

Filed May 29, 1943

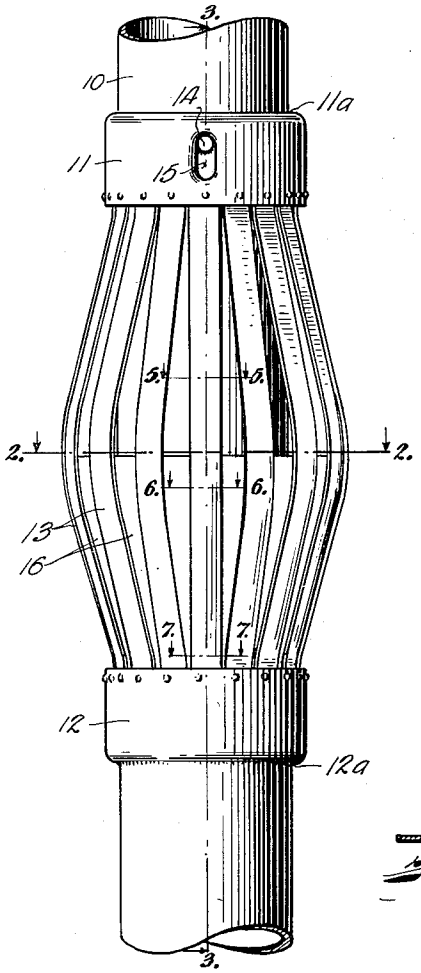


Fig. 1.

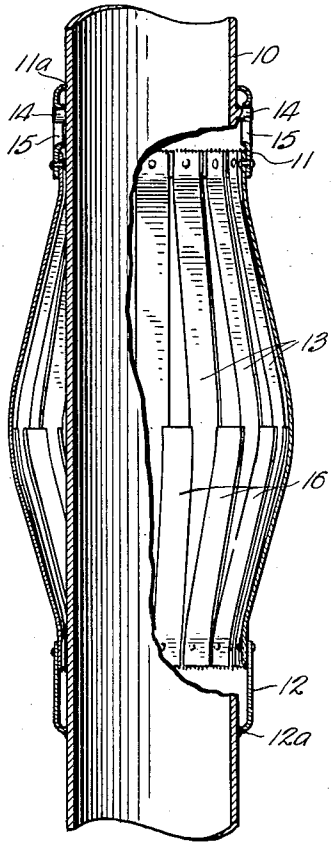


Fig. 3.

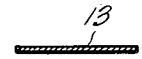


Fig. 5.

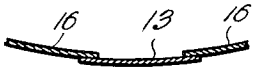


Fig. 6.

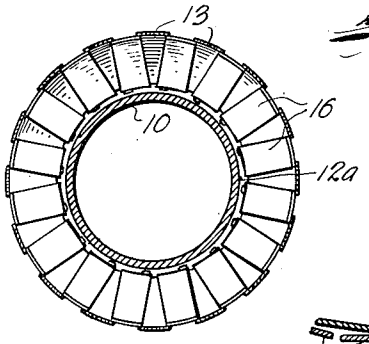


Fig. 2.

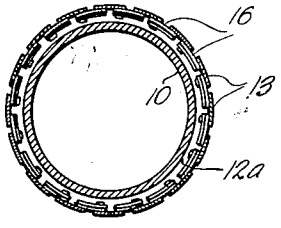


Fig. 4.



Fig. 7.

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Patented Jan. 1, 1946

2,392,145

UNITED STATES PATENT OFFICE

2,392,145

CEMENT BASKET

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Application May 29, 1943, Serial No. 489,047

4 Claims. (Cl. 166—13)

My invention relates to new and useful improvements in cement baskets for oil wells, and refers more particularly to a device attached to the casing for centering the casing during drilling operations and serving as an obstruction during cementing to position the cemented off zone.

On occasions it becomes necessary to introduce cement into the annular space between the casing and the well bore above and below the producing formation. The cement when set serves to isolate different producing zones penetrated by the well bore, to prevent water from entering the producing formations and to prevent side wall cavings from falling into the formation and obstructing the flow of oil into the well. Cement baskets attached to the casing below levels where the cement columns are to be located form receptacles and obstructions to downward flow of the cement.

The cement baskets are affixed to the casing at the surface and lowered with the casing to the desired point in the well. They must be so shaped that their flexible or expandible members will not be permanently distorted or bent by obstructions in the bore when the casing is either raised or lowered. They must be collapsible to conform to the uneven contour of the well bore and snugly fit the section of the bore when permanently located. Furthermore, it is desirable that the lower portions of the baskets are closed to effectively support the cement columns.

An important object of my invention is to provide cement baskets for oil wells which are inherently flexible and to readily follow the contour of the well bore, and withstand the weight of the cement.

Another object of my invention is to provide cement baskets adapted to form closed receptacles when either expanded or contracted.

Still another object of my invention is to provide cement baskets that are not permanently deformed by obstructions in the well bore either during raising or lowering of the casing.

Other objects and advantages of my invention will be apparent during the course of the following description.

In the drawing forming a part of this specification and wherein like numerals are employed to designate like parts throughout the same,

Fig. 1 is an elevational view showing a cement basket embodying my invention mounted on a section of well casing,

Fig. 2 is a transverse sectional view taken on the line 2—2 of Fig. 1,

Fig. 3 is a vertical sectional view taken on the line 3—3 of Fig. 1, parts being broken away for clearness of illustration,

Fig. 4 is a transverse sectional view similar to that shown in Fig. 2 with the basket contracted,

Fig. 5 is an enlarged transverse sectional view taken on the line 5—5 of Fig. 1,

Fig. 6 is an enlarged fragmentary transverse sectional view taken on the line 6—6 of Fig. 1, and

Fig. 7 is an enlarged fragmentary transverse sectional view taken on the line 7—7 of Fig. 1.

Referring now to the drawing which shows a cement basket embodying my invention attached to a section of well casing 10. The basket is formed with upper and lower collars 11 and 12 connected by a plurality of out-bowed flexible strips 13. The ends of strips 13 are secured within the collars by riveting or welding. The inturned outside edges 11*a* and 12*a* of the collars snugly fit the casing 10 spacing the collars sufficiently from the casing to accommodate the attached ends of the flexible strips 13. As best shown in Figs. 1 and 3, the lower collar 12 is welded to the casing, while the upper collar 11 has a limited axial movement thereon. Pins 14 fixed to and projecting radially from the casing 10 through vertical elongated slots 15 in collar 11 limit the movement of the collar.

An inner second row of flexible strips 16 is positioned within the outer row of flexible strips 13. The lower ends of strips 16 are attached to the lower collar 12, while the free upper ends thereof terminate substantially midway the length of outer strips 13. As shown in Fig. 3 the inner free end strips 16 are spaced about the circumference of the lower collar 12 so as to close the spaces or interstices formed by spreading of the outer row of strips 13.

Both the inner and outer rows of strips 13 and 16 are curved in cross section substantially throughout the length of their contact as shown in Fig. 6, but are flat in cross section adjacent their attached lower ends as shown in Fig. 7. The flat cross sectional portions of the strips provide resiliency for spreading or outbowing of the strips and the curved cross sectional portions provide reinforcement and stiffening of the strips above the resilient portions. Furthermore, the curved cross sectional shape of the strips causes the inner strips to conform with and lie flat against the outer strips when the latter are either expanded or contracted, the intimate contact between the strips forming an essentially tight receptacle.

When expanded the basket is normally at least

as large as the maximum diameter of the well bore. When the casing and the basket are lowered into the well the basket contracts when passing through constricted portions of the well bore, i. e., collar 11 slides upwardly on the casing and the bowed portions of strips 13 move toward the casing. The basket holds the casing properly centered in the well bore so that cement injected into the annular space will flow properly around the casing to form an impermeable plug. The cement flows into the basket which thus forms a receptacle and an obstruction for the cement.

It is to be understood that the form of the invention herewith shown and described is to be taken as a preferred example of the same and that various changes in the size, shape and arrangement of parts may be resorted to without departing from the spirit of my invention or the scope of the appended claims.

Having thus described my invention, I claim:

1. In combination with a well casing, a cement basket and guide comprising upper and lower collars surrounding and attached to the well casing, outbowed flexible strips fastened at their extremities to the collars and extending lengthwise of the casing, upstanding free end strips anchored to the lower collar within the fastened outbowed strips and extending only a portion of the distance between the collars, said free end strips overlapping adjacent outbowed strips to close the lower portion of the spaces therebetween forming a receptacle surrounding the casing.

2. In combination with a well casing, a cement basket and guide comprising outbowed flexible strips extending lengthwise of the casing, said strips spaced around the circumference of the well casing and fastened at their ends to the casing, upstanding free end strips within the fastened outbowed strips, said free end strips having their lower ends anchored to the casing and their upstanding portions overlapping adjacent outbowed strips to close the lower portion of the spaces therebetween forming a receptacle surrounding the casing.

3. In combination with a well casing a cement basket and guide comprising outbowed flexible strips extending lengthwise of the casing, said strips spaced around the circumference of the well casing and fastened at their ends to the casing, upstanding free end strips within the fastened outbowed strips, said free end strips having their lower ends anchored to the casing and their upstanding portions overlapping adjacent outbowed strips to close the lower portion of the spaces therebetween forming a receptacle, said fastened and free end strips curved in cross section substantially throughout the length of their contact and flat in cross section adjacent their attached ends, the flat portions of said strips providing resiliency for spreading of the strips and the curved portions providing reinforcment and stiffening for the receptacle portion of the basket.

4. In combination with a well casing a cement basket and guide comprising upper and lower collars surrounding the well casing and at least one of said collars affixed to the casing, outbowed flexible strips fastened at their extremities to the upper and lower collars, upstanding free ends flexible strips attached to the lower collar within the fastened outbowed strips and extending only a portion of the distance between the collars, said free end strips overlapping adjacent outbowed strips to close the lower portion of the spaces therebetween, forming a receptacle surrounding the casing, said fastened and free end strips curved in cross section substantially throughout the length of their contact and flat in cross section adjacent their attached ends, the flat portion of said strips providing resiliency for spreading of the strips and the curved portions providing reinforcement and stiffening for the receptacle portion of the basket.

JESSE E. HALL.