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W. C. GIBSON

2,842,209

SELF-LOCKING TUBING HANGER

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Fig. 1.

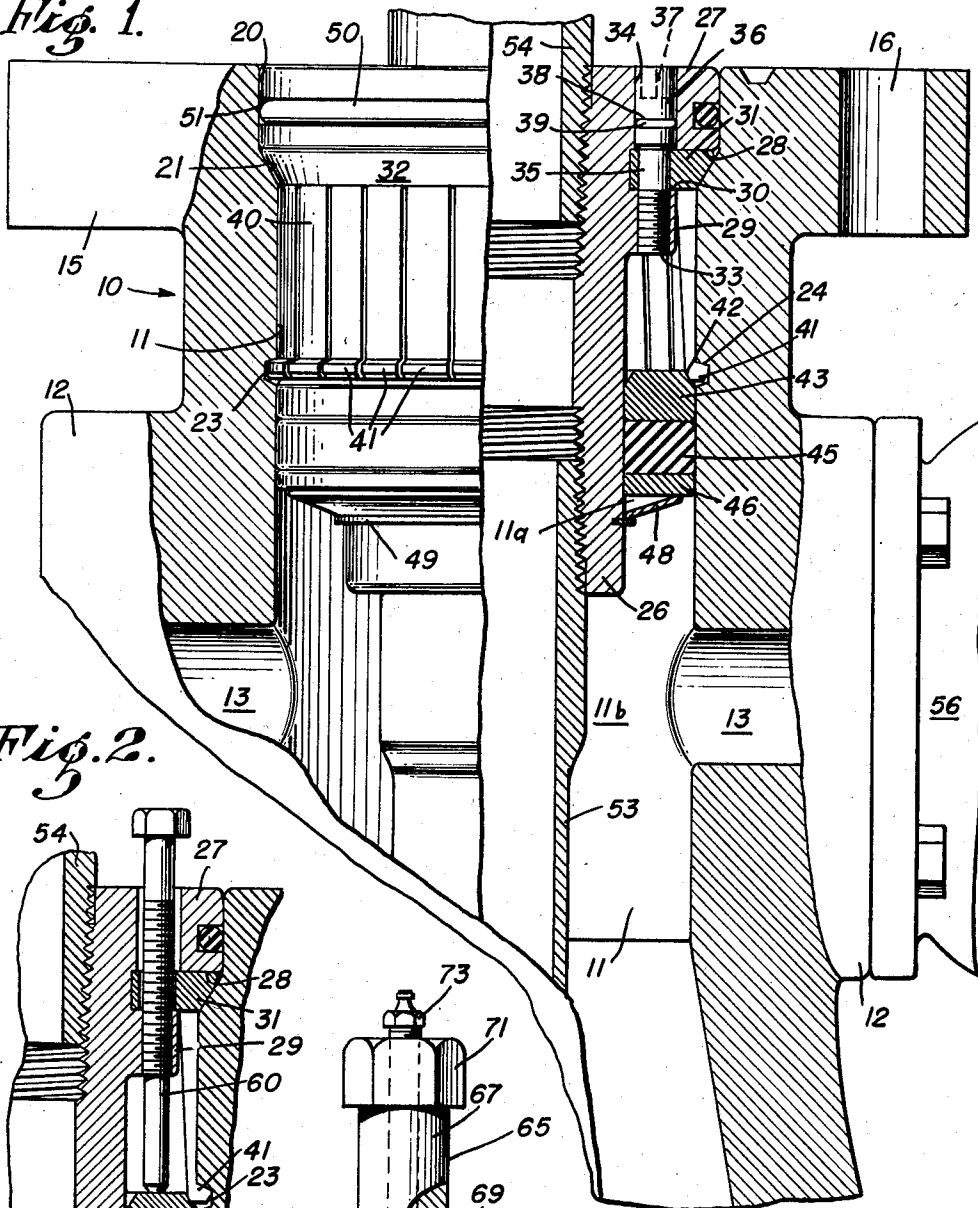


Fig. 2.

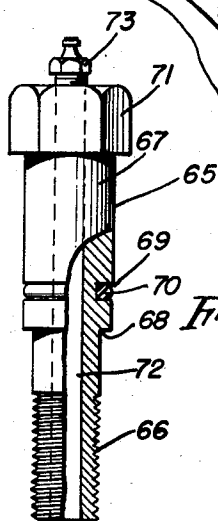
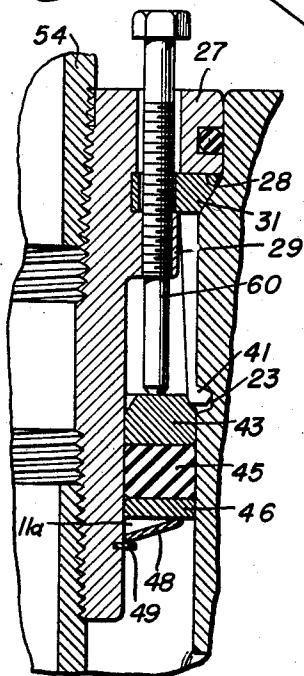


Fig. 3.

INVENTOR.
WILFRED C. GIBSON
BY *Shelton & Shuman*
Attorney

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2,842,209

SELF-LOCKING TUBING HANGER

Wilfred C. Gibson, Fullerton, Calif., assignor to
Shaffer Tool Works, Brea, Calif.

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19 Claims. (Cl. 166-75)

This invention relates generally to equipment for oil wells and relates more particularly to improvements in tubing hangers.

While the invention has particular utility in connection with oil wells and the like, and is herein shown and described in an oil well installation, it is to be understood that its utility is not confined thereto.

Tubing hangers are commonly used in oil wells, the tubing being secured to the hangers and held suspended thereby. The present invention provides a tubing hanger that is automatically self-locking in the tubing head, the locking or latching means including resilient fingers having respective members adjacent the free ends thereof receivable in an annular groove in the head, there also being an annular plate engageable with the free ends of the fingers for releasably securing said members in said grooves. A spring is provided to urge the plate into the member locking position and pressure within the well further urges said plate into the locking position. Normally, release of the hanger so that it may be removed is effected by release of the well pressure on said plate. There is also means provided for forcibly moving the plate out of the locking position under unusual conditions as when the parts stick in the tubing head.

It is another object of the invention to provide a tubing hanger of this character that may be easily and quickly installed.

It is a further object of the invention to provide a device of this character having an effective seal.

A still further object of the invention is to provide a device of this character wherein installation and removal time is reduced to a minimum.

Another object of the invention is to provide a device of this character that is simple and sturdy in construction and that is relatively inexpensive to manufacture.

The characteristics and advantages of the invention are further sufficiently referred to in connection with the following detailed description of the accompanying drawings which represent several embodiments. After considering these examples, skilled persons will understand that many variations may be made without departing from the principles disclosed, and I contemplate the employment of any structures, arrangements, or modes of operation that are properly within the scope of the appended claims.

Referring to the drawings, which are for illustrative purposes only:

Fig. 1 is a view, partially in longitudinal section, of a tubing hanger embodying the present invention, said hanger being installed in a tubing head and supporting tubing;

Fig. 2 is a fragmentary section showing an alternative release means; and

Fig. 3 is a side view of another alternative release means with a portion broken away to show certain structural details.

Referring more particularly to Fig. 1 there is shown a tubing head, indicated generally at 10, having a longi-

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tudinally extending passage 11 therethrough. Diametrically opposed, oppositely extending bosses 12 having passages 13 extending therethrough communicate with the longitudinally extending passage 11 of the head and the usual outwardly extending flange 15 is provided at the top end of the body and has the usual bolt holes, indicated at 16, therein.

The tubing head in which the present hanger is adapted to be disposed is the upper head of the well assembly. The passage 11 of the tubing head has an enlarged portion 20 at the upper end thereof from which a shoulder 21 tapers inwardly. Downwardly spaced from the shoulder 21, as shown in Fig. 1, is a groove or recess 23 extending from the surface of the passage 11 into the wall thereof, said groove having its upper wall 24 inclined outwardly from the surface of the passage 11 and in a downwardly direction, the purpose of this arrangement being more particularly described hereinafter.

There is a tubing supporting member or collar 26 having an outwardly extending flange 27 at its outer end or upper end, said flange being operably received in the enlarged portion 20 of passage 11. The under side 28 of the flange 27 lies in substantially the plane of the upper end of the tapered portion 21 of the passage 11 and spaced downwardly from said under side 28 is a flange 29 which extends outwardly of the collar 26. The outer periphery of the flange 29 is spaced inwardly of the walls of the passage 11 and the upper side 30 of said flange 29 is substantially parallel to the under side 28 of the flange 27.

Locking means is provided for releasably securing the collar 26 in the tubing head and this locking means comprises a pair of complementary parts each having semi-circular body portions 31 removably received in the groove defined by the flanges 27 and 29. Combined, the body portions 31 form a ring extending about the collar 26. The outer edge 32 of the portions 31 are tapered downwardly and inwardly so as to seat on the surface 21, flange 27 then resting upon said body portions 31 so as to support the collar 26 within the tubing head.

Flange 29 of the collar is provided with axially extending, internally threaded bores 33 aligned with larger bores 34 in the flange 27, the bores 33 are arranged on diametrically opposite sides of the collar 26, the bores 34 being likewise arranged. Each of the body portions 31 is provided with an opening therethrough for reception of a bolt 35 having its lower end threaded for reception in a respective bore 33 and having a head 36 receivable in respective bore 34. Each bolt 35 is provided with a multiple sided opening 37 for reception of an "Allen" wrench, or the like, and there is a groove 38 for reception of an O ring 39 to provide a seal between the bolt and the adjacent walls of the bore 34. The bolts 35 secure the respective body portions 31 in position on the collar between the flanges 27 and 29.

Extending axially from the body portions 31 are a series of annularly spaced fingers 40 which are resilient. As shown in the drawing these fingers extend downwardly and each is provided with an outwardly extending flange 41 adjacent the free lower end. The upper face of each flange 41 is inclined at substantially the same angle as the wall 24 of the recess 23 in the tubing head so that when said flanges 41 are received in said recess 23 the upper sides of said flanges engage or abut said wall 24. It is to be noted that when the device is in position the outer surfaces of the fingers 40 are in substantial engagement with or lie alongside the adjacent surface of the passage 11.

The inner side of each finger, adjacent the free end thereof, is beveled at 42, the inclination of the part 42 being downwardly and outwardly of the back side of the finger. These beveled parts 42 of the fingers are

adapted to be engaged by a correspondingly beveled face of a plate 43, which will be termed the upper plate, said plate face being at the upper end, it being noted that said plate is of substantial thickness and the upper end portion extends upwardly of the plane of the lower ends of the fingers 40 and locks the flanges 41 in the grooves 23 when the device is in the locked position.

Beneath the packing ring, in the space 11a between the collar 26 and wall of the passage 11 is a gasket, or packing element 45 of any suitable resilient material such as Neophrene, or the like, and below said packing element is disposed an annular plate 46 which will be termed the lower plate. These plates and packing element are urged upwardly by an annular "Belleville" spring 48 which reacts between the lower plate 46 and an annular spring clip 49 disposed in a groove provided therefor in the outer side of the collar 26.

An additional seal is provided at the upper end of the device by an O ring 50 disposed in a peripheral groove 51 in flange 27.

The collar 26 has internally threaded portions at the respective ends thereof, the lower threaded portion threadably receiving the externally threaded end portion of a piece of tubing 53 and the upper threaded portion threadably receiving the externally threaded end of an upwardly extending section of tubing 54.

The passages 13 of the tubing head are provided with the usual connections, not shown, and a valve 56 is secured to one of the bosses 12 to control fluid flow from the passage 13 through said boss and relieve pressure within the space 11b between the wall of the passage 11 of the tubing head and the tubing 53.

When installing the hanger with the tubing supported thereby said hanger is dropped into the upper end of the tubing head. As the hanger assembly moves into position in said tubing head flanges 41 of the fingers 40 engage the inclined portion 21 of the internal passage of the tubing head and said flanges slide on the inclined portion 21. The free ends of the fingers are forced inwardly until the flanges reach the lower end of said portion. Further downward movement of the device causes the flanges to slide down the wall of the passage 11 until they reach and snap into the groove 23 due to the resilience of the fingers. The "Belleville" spring 48 urges the plates 43 and 46 and the packing element 45 upwardly so that the plate 43 locks the flanges 41 in the groove 23. Further, a locking force is applied by fluid pressure in the passage 11 which urges the plates 46 and 43 upwardly and compresses the packing element 45 to cause same to securely seal the collar in the head. The O ring 50 at the upper end of the device serves as a seal for hydraulic pressure and also provides a safety seal should the main seal 45 fail.

When it is desired to remove the hanger from the head the valve 56 may be opened to relieve the pressure within the head. The collar may then be removed by the application of suitable upward force. Removal of the device is possible due to the upward and inward inclination of the wall 24 of the groove 23 and the corresponding inclination of the upper surface of the flanges 41 and also to the inclination of the portion 42 at the back of the flanges 41 and corresponding inclination of the adjacent portion of the upper plate.

Under certain unusual conditions the device may become stuck so that it can not be removed upon relief of the pressure in passage 11. One of such conditions may occur after the device has been installed for a considerable period of time and the rubber packing element 45 adheres to the wall of the passage 11. Should such a condition occur the present invention contemplates means for effecting release of the device.

One of the means for thus releasing the device is shown in Fig. 2. The bolts 35 are removed and bolts 60 are

screwed into the tapped openings 33 of the flange 29. The screws 60 are of sufficient length so as to engage the upper plate 43 and force said plate, packing element 45 and plate 46 downwardly against the force of spring 48. This downward pressure will break the adhesion of the packing element to the adjacent wall of the passage 11 and move the plate 43 sufficiently to permit flanges 41 of the fingers 40 to leave the groove 23 and permit ready removal of the hanger assembly.

Another means for effecting release of the device under the above referred to unusual conditions is shown in Fig. 3. In this arrangement bolts 65 are substituted for the bolts 35. Each bolt 65 has an inner end portion 66 which is externally threaded and is screwed into the tapped bore 33. The body 67 of the bolt is of greater diameter than the threaded portion and is received in the bore 34. A shoulder 68 at the lower end of the body engages the portions 31 of the latching spring means or mechanism and the bolt is provided with an annular recess 69 in which is disposed an O ring 70 to provide suitable sealing means for the bolt. Extending longitudinally through the bolt from the outer end of the head 71 is a passage 72. The outer end portion of the passage 72 is internally threaded for reception of a nipple 73 by means of which a hydraulic device may be attached for forcing suitable hydraulic fluid through the passage 72 and into the space in portion 11a of passage 11 between the body portions 31 of the latching means and the upper plate 43. Sufficient pressure may be thereby applied to the plate 43 so as to force same downwardly to effect downward release of packing element 45 and the spring locking device.

I claim:

1. In combination with the tubing head having a longitudinal passage therethrough with an upwardly and outwardly flaring merging at its upper end in an enlarged diameter portion, and an annular groove in said passage, said groove being spaced downwardly from said shoulder and having the upper wall thereof inclined outwardly and downwardly to the bottom of said groove, said tubing head having a cross-passage extending outwardly from the longitudinally extending passage, of a tubing hanger comprising a collar for connection with tubing, said collar having an enlarged diameter upper end portion removably received in the enlarged portion of the tubing head and having diametrically arranged, longitudinally extending bores, and an outwardly extending flange spaced downwardly from the enlarged portion of said collar and having tapped openings therein aligned with the bores of said enlarged portion of the collar, the periphery of said flange being spaced from the adjacent wall of the tubing head passage; latching means comprising a pair of semi-circular members each comprising a body portion removably received in the space between the flange of the collar and the enlarged end portion thereof and having the outer arcuate edge tapered to conform to and seat upon said shoulder, each body portion having a hole aligned with the bore of the enlarged portion of the collar and the tapped opening in the flange thereof; bolts having portions received in said bores and threaded portions screwed into said tapped openings; arcuately spaced, longitudinally extending resilient fingers depending from the body portions and disposed adjacent the wall of said tubing head passage, the outer surfaces of said fingers conforming to the curvature of said passage wall; an outwardly extending flange on each finger adjacent the lower free end thereof and receivable in the groove in the tubing head and having an upper side with substantially the same inclination as the inclination of the upper wall of the groove, each of said fingers also having a downwardly and outwardly inclined surface at the inner free end; an annular upper plate provided with an outer face having substantially the same inclination as said surface of the inner free ends of the fingers and

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engageable therewith, said plate being received between the collar and the adjacent wall of the tubing head passage; an annular packing element beneath said upper plate and between said collar and wall of said tubing head passage; an annular lower plate beneath said packing element; a frusto-conical spring washer engageable with the lower plate; releasable means for securing said washer to the collar; sealing means for the enlarged upper end of the collar to provide a seal between said enlarged upper end and the adjacent wall of the enlarged portion of the passage of the tubing head; and valve means for controlling said cross-passage of the tubing head.

2. In combination with the tubing head having a longitudinal passage therethrough with an upwardly and outwardly flaring shoulder merging at its upper end in an enlarged diameter portion, and an annular groove in said passage, said groove being spaced downwardly from said shoulder and having the upper wall thereof inclined outwardly and downwardly to the bottom of said groove, said tubing head having a lateral passage extending outwardly from the longitudinally extending passage, of a tubing hanger comprising a collar for connection with tubing, said collar having an enlarged diameter upper end portion removably received in the enlarged portion of the tubing head and having longitudinally extending bores, and an outwardly extending flange spaced downwardly from the enlarged portion of said collar and having tapped openings therein aligned with said bores of the collar, the periphery of said flange being spaced from the adjacent wall of the tubing head passage; latching means comprising a pair of semi-circular members each comprising a body portion removably received in the space between the flange of the collar and the enlarged end portion thereof and having the outer arcuate edge tapered to conform to and seat upon said shoulder, each body portion having a hole aligned with the bore of the enlarged portion of the collar and the tapped opening in the flange thereof; bolts having portions received in said bores and threaded portions screwed into said tapped openings; arcuately spaced, longitudinally extending resilient fingers depending from the body portions and disposed adjacent the wall of said tubing head passage; an outwardly extending flange on each finger adjacent the lower free end thereof, receivable in the groove in the tubing head and having an upper side with substantially the same inclination as the inclination of the upper wall of the groove, each of said fingers also having a downwardly and outwardly inclined surface at the inner free end; an annular upper plate on said collar and provided with an outer face having substantially the same inclination as said surface of the inner free ends of the fingers and engageable therewith; an annular packing element on said collar beneath said upper plate and forming a seal between said collar and wall of said tubing head passage; an annular lower plate on said collar beneath said packing element; a frusto-conical spring washer on said collar, engageable with the lower plate and exerting yielding pressure on said lower plate; releasable means for securing said washer to the collar; sealing means for the enlarged upper end of the collar to provide a seal between said enlarged upper end and the adjacent wall of the enlarged portion of the passage of the tubing head; and valve means for controlling said lateral passage of the tubing head.

3. In combination with the tubing head having a longitudinal passage therethrough with an upwardly and outwardly inclined annular shoulder merging at its upper end in an enlarged diameter portion, and an annular groove in said passage, said groove being spaced downwardly from said shoulder and having the upper wall thereof inclined outwardly and downwardly to the bottom of said groove, said tubing head having a branch passage connected with the longitudinally extending passage, of a tubing hanger comprising a collar, said collar having an enlarged diameter upper end portion remov-

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ably received in the enlarged portion of the tubing head, and an outwardly extending flange spaced downwardly from the enlarged portion of said collar, the periphery of said flange being spaced from the adjacent wall of the tubing head passage; latching means comprising a pair of semi-circular members each comprising a body portion removably received in the space between the flange of the collar and the enlarged end portion thereof; means for securing said body portions to said collar; arcuately spaced, longitudinally extending resilient fingers depending from the body portions and disposed adjacent the wall of said tubing head passage; an outwardly extending flange on each finger adjacent the lower free end thereof, receivable in the groove in the tubing head and having an upper side with substantially the same inclination as the inclination of the upper wall of the groove, each of said fingers also having a downwardly and outwardly inclined surface at the inner free end; an annular upper plate on said collar, said plate being provided with an outer face having substantially the same inclination as said surface of the inner free ends of the fingers and engageable therewith; an annular packing element on the collar and beneath said upper plate; an annular lower plate on said collar beneath said packing element; a frusto-conical spring washer engageable with the lower plate; releasable means for securing said washer to the collar; sealing means for the enlarged upper end of the collar to provide a seal between said enlarged upper end and the adjacent wall of the enlarged portion of the passage of the tubing head; and valve means for controlling said branch passage of the tubing head.

4. In combination with the tubing head having a longitudinal passage therethrough with a tapered shoulder therein, and an annular groove in said passage, said groove being spaced downwardly from said shoulder and having the upper wall thereof inclined outwardly and downwardly to the bottom of said groove, of a tubing hanger comprising a collar, said collar having an enlarged diameter upper end portion removably received in the enlarged portion of the tubing head; latching means comprising a pair of semi-circular members each having a body portion removably seating on said shoulder; means for securing the body portions to the collar; arcuately spaced, longitudinally extending resilient fingers depending from the body portion; an outwardly extending flange on each finger adjacent the lower free end thereof and receivable in the groove of the tubing head, and having an upper side with substantially the same inclination as the inclination of the upper wall of the groove; a pair of annular plates on the collar; an annular packing element on the collar disposed between said plates; yielding means engageable with one of the plates to urge the plates and packing element upwardly so that the other plate will engage said fingers and lock the flanges thereof in said groove and compress said packing element into secure sealing engagement with the collar and adjacent wall of the longitudinal passage of said tubing head; and means for effecting release of said latching means.

5. The invention defined by claim 4 wherein the release means comprises means for releasing fluid pressure within the longitudinal passage of the tubing head.

6. The invention defined by claim 4 wherein the means for effecting release of the latching means includes means for applying downward pressure on the upper plate for effecting downward movement of the plates and packing element.

7. The invention defined by claim 4 wherein means for effecting release of the latching means includes screws for applying downward pressure on the upper plate.

8. The invention defined by claim 4 wherein the means for effecting release of the latching means comprises means for applying fluid pressure on the upper plate for effecting downward movement thereof.

9. In combination with the tubing head having a longitudinal passage therethrough with an upwardly and out-

wardly flaring shoulder merging at its upper end in an enlarged diameter portion, and an annular groove in said passage, said groove being spaced downwardly from said shoulder and having the upper wall thereof inclined outwardly and downwardly to the bottom of said groove, of a tubing hanger comprising a collar, said collar having an enlarged diameter upper end portion removably received in the enlarged portion of the tubing head and having diametrically arranged, longitudinally extending bores, and an outwardly extending flange spaced downwardly from the enlarged portion of said collar, and having tapped openings therein aligned with the bores of said enlarged portion of the collar; latching means comprising a pair of semi-circular members each having a body portion removably received in the space between the flange of the collar and the enlarged end portion thereof, each body portion having a hole aligned with the bore of the enlarged portion of the collar and the tapped opening in the flange thereof; arcuately spaced, longitudinally extending resilient fingers depending from the body portion and disposed adjacent the wall of said tubing head passage, the outer surfaces of said fingers conforming to the curvature of said passage wall; and outwardly extending flange on each finger adjacent the lower, free end thereof and receivable in the groove in the tubing head and having an upper side with substantially the same inclination as the inclination of the upper wall of the groove; an annular upper plate on said collar engageable with the free ends of said fingers; an annular packing element on said collar, beneath said upper plate; an annular lower plate on said collar beneath said packing element; spring means urging the plates and packing element upwardly; and bolts in the bores of said enlarged collar portion, said bolts being threaded into the tapped openings of the collar flange and engageable with said upper plate to force same downwardly.

10. In combination with the tubing head having a longitudinal passage therethrough with an upwardly and outwardly flaring shoulder merging at its upper end in an enlarged diameter portion, and an annular groove in said passage, said groove being spaced downwardly from said shoulder and having the upper wall thereof inclined outwardly and downwardly to the bottom of said groove, of a tubing hanger comprising a collar, said collar having an enlarged diameter upper end portion removably received in the enlarged portion of the tubing head and having diametrically arranged, longitudinally extending bores, and an outwardly extending flange spaced downwardly from the enlarged portion of said collar and having tapped openings therein aligned with the bores of said enlarged portion of the collar; latching means comprising a pair of semi-circular members each having a body portion removably received in the space between the flange of the collar and the enlarged end portion thereof, each body portion having a hole aligned with the bore of the enlarged portion of the collar and the tapped opening in the flange thereof; arcuately spaced, longitudinally extending resilient fingers depending from the body portion and disposed adjacent the wall of said tubing head passage, the outer surfaces of said fingers conforming to the curvature of said passage wall; an outwardly extending flange on each finger adjacent the lower free end thereof and receivable in the groove in the tubing head and having an upper side with substantially the same inclination as the inclination of the upper wall of the groove; an annular upper plate on said collar engageable with the free ends of said fingers; an annular packing element on said collar beneath said upper plate; an annular lower plate on said collar beneath said packing element; spring means urging the plates and packing element upwardly; and a fixture screwed into at least one of said tapped openings adapted to be connected to a source of fluid pressure.

11. In combination with the tubing head having a passage therethrough with a shoulder therein and an

annular groove in said passage spaced downwardly from said shoulder, of a tubing hanger comprising a collar; latching means comprising a pair of semi-circular members each having a body portion removably seating on said shoulder; means for securing the body portions to the collar; arcuately spaced, longitudinally extending resilient fingers depending from the body portion; a projection adjacent the free end of each finger for reception in said groove; a pair of annular members on the collar; an annular packing element on the collar between said members; yielding means urging said plates and element upwardly; and means for effecting release of the latching means.

12. A tubing hanger, comprising: a collar for connection with tubing, said collar having an enlarged diameter upper end portion with a peripheral groove for a sealing element and having diametrically arranged longitudinally extending bores, and an outwardly extending flange spaced longitudinally from the enlarged portion of said collar and having tapped openings therein aligned with the bores of said enlarged portion of the collar; latching means comprising a pair of semi-circular members each comprising a body portion removably received in the space between the flange of the collar and the enlarged end portion thereof and having an outer arcuate, tapered edge, each portion having a hole aligned with the bore of the enlarged portion of the collar and the tapped opening in the flange thereof; bolts having portions received in said bores, and threaded portions screwed into said tapped openings; arcuately spaced, longitudinally extending resilient fingers on the body portions; an outwardly extending flange on each finger adjacent the free end thereof, having an upper side inclined outwardly and away from the body portions, each of said fingers also having a back surface at the free end, inclined outwardly and toward said free end; an annular plate on said collar provided with an outer face having substantially the same inclination as said surface of the inner free ends of the fingers and engageable therewith; a second annular plate on said collar; a resilient packing element on said collar and between said plates; a frusto-conical annular spring washer engageable with said second annular plate; and releasable means for securing said washer to the collar.

13. A tubing hanger, comprising: a collar for connection with tubing, said collar having an enlarged diameter upper end portion having diametrically arranged longitudinally extending bores, and an outwardly extending flange spaced longitudinally from the enlarged portion of said collar and having tapped openings therein aligned with said bores; latching means comprising a pair of semi-circular members each comprising a body portion removably received in the space between said flange and said enlarged end portion having an outer arcuate, tapered edge, each portion having a hole aligned with the bore of the enlarged portion of the collar and the tapped opening in the flange thereof; bolts having portions received in said bores and holes, and threaded portions screwed into said tapped openings; arcuately spaced, resilient fingers extending longitudinally from the body portions; an outwardly extending member on each finger adjacent the free end thereof; an annular plate on said collar engageable with the inner sides of the free end portions of said fingers; a second annular plate on said collar; a resilient packing element on said collar and between said plates; a frusto-conical annular spring washer engageable with said second annular plate; and releasable means for securing said washer to the collar.

14. A tubing hanger, comprising: a collar for connection with tubing, said collar having an enlarged diameter upper end portion with a peripheral groove for a sealing element, and an outwardly extending flange spaced longitudinally from the enlarged portion of said collar; latching means comprising a pair of semi-circular members each comprising a body portion removably received in the space between the flange of the collar and

the enlarged end portion thereof and having an outer arcuate tapered edge; means securing said body portions to said collar; resilient fingers extending longitudinally from the body portions; an outwardly extending member on each finger adjacent the free end thereof; an annular plate on said collar engageable with the inner free ends of the fingers; a second annular plate on said collar; a resilient packing element on said collar and between said plates; and spring means engageable with said second plate, urging said plate toward the enlarged end of said collar.

15. A tubing hanger, comprising: a collar for connection with tubing, said collar having an enlarged diameter upper end portion with a peripheral groove for a seating element and having diametrically arranged longitudinally extending bores, and an outwardly extending flange spaced longitudinally from the enlarged portion of said collar and having tapped openings therein aligned with the bores of said enlarged portion of the collar; latching means comprising a pair of semi-circular members each comprising a body portion removably received in the space between the flange of the collar and the enlarged end portion thereof and having an outer arcuate tapered edge, each portion having a hole aligned with the bore of the enlarged portion of the collar and the tapped opening in the flange thereof; bolts having portions received in said bores, and threaded portions screwed into said tapped openings; arcuately spaced, longitudinally extending resilient fingers depending from the body portions; an outwardly extending flange on each finger adjacent the free end thereof having an upper side inclined outwardly and away from the body portions; each of said fingers also having a back surface at the free end, inclined outwardly and toward said free end; an annular plate on said collar provided with an outer face having substantially the same inclination as said surface of the inner free ends of the fingers and engageable therewith; an annular lower plate on said collar; a resilient packing element on said collar and between said plates; a frusto-conical annular spring washer engageable with one of the plates; and releasable means for securing said washer to the collar.

16. A tubing hanger, comprising: a collar for connection with tubing, said collar having an enlarged end portion; latching means comprising cooperating members each comprising a body portion secured to said collar adjacent said enlarged end portion and having a seat por-

tion; peripherally spaced resilient fingers extending from the body portions; an outwardly extending member on said fingers adjacent the free ends thereof; a pair of annular plates on said collar, one of said plates being engageable with the free ends of the fingers for urging same outwardly; resilient packing means on said collar and between said plates; and means urging said plates and packing means toward the enlarged end of said collar.

17. An article of manufacture, comprising: a semi-circular member comprising an arcuate body portion having an outer beveled edge, and having a longitudinally extending hole therein; arcuately spaced, resilient fingers extending longitudinally from the body portion; an outwardly extending flange on each finger adjacent the free end thereof having an upper side inclined outwardly and away from the body portion, each of said fingers also having a back surface at the free end, inclined outwardly and toward said free end; and means engageable with said back surfaces and adapted to be subjected to fluid pressure to urge said fingers outwardly radially.

18. A tubing hanger for wells, including: a collar for connection with tubing; latching means including cooperating members each comprising an arcuate body portion secured to said collar and having a seat portion; peripherally spaced resilient fingers extending from the body portions; an outwardly extending member on said fingers adjacent the free ends thereof; and means engageable with said fingers and adapted to be subjected to well pressure to urge said free ends of said fingers outwardly relative to said collar.

19. A tubing hanger for wells, including: a collar for connection with tubing; latching means for said collar including resilient fingers spaced about said collar and having the ends adjacent one end of said collar secured to said collar; an outwardly extending member on each of said fingers adjacent the free ends thereof; and fluid pressure responsive means engageable with said fingers and adapted to urge said free ends of the fingers outwardly of the collar when subjected to pressure in one direction.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 2,842,209

July 8, 1958

Wilfred C. Gibson

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 4, line 37, after "flaring" insert -- shoulder --.

Signed and sealed this 23rd day of September 1958.

(SEAL)
Attest:

KARL H. AXLINE
Attesting Officer

ROBERT C. WATSON
Commissioner of Patents