FIP3201 SR 2,465,027

March 22, 1949. E. C. McMANAWAY 2,465,027

RELEASE COUPLING FOR WELL CASINGS

Filed Jan. 5, 1946

2 Sheets-Sheet 1

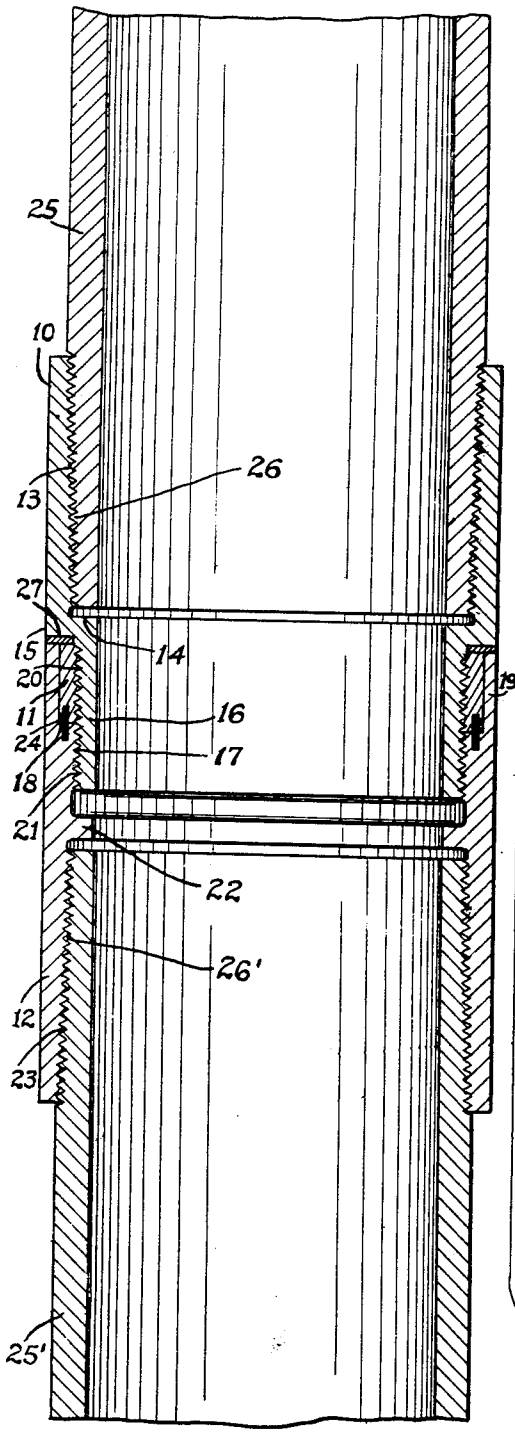


Fig. 1

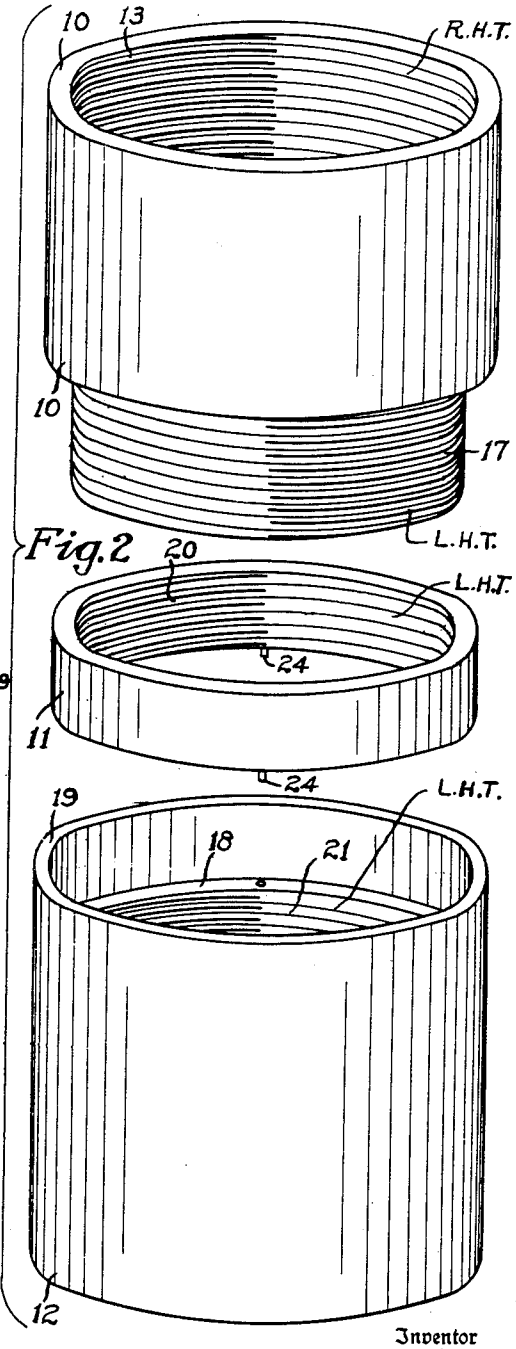


Fig. 2

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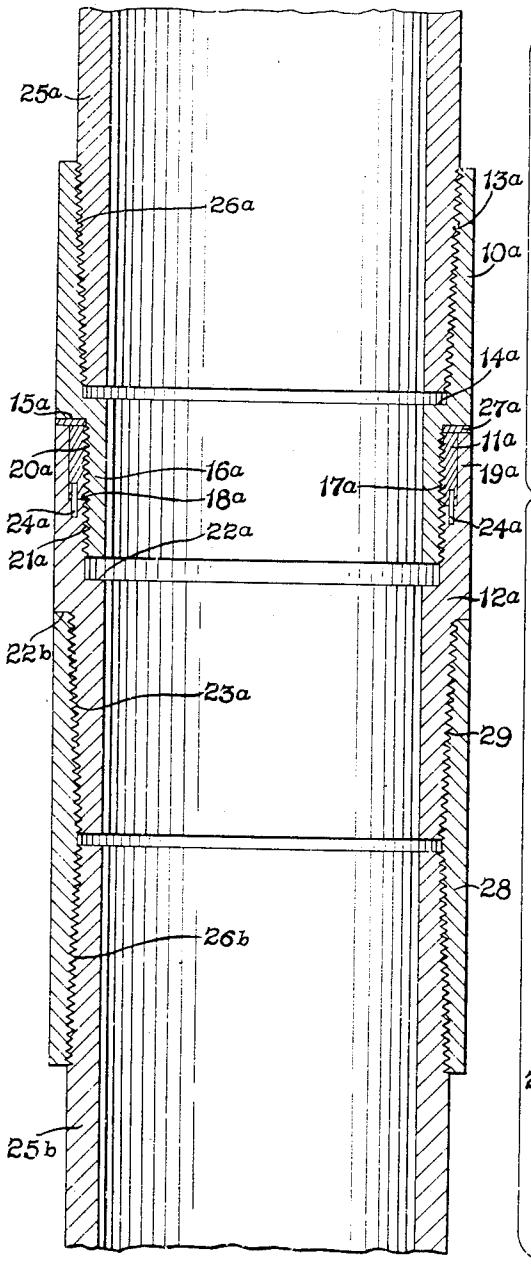


Fig. 3

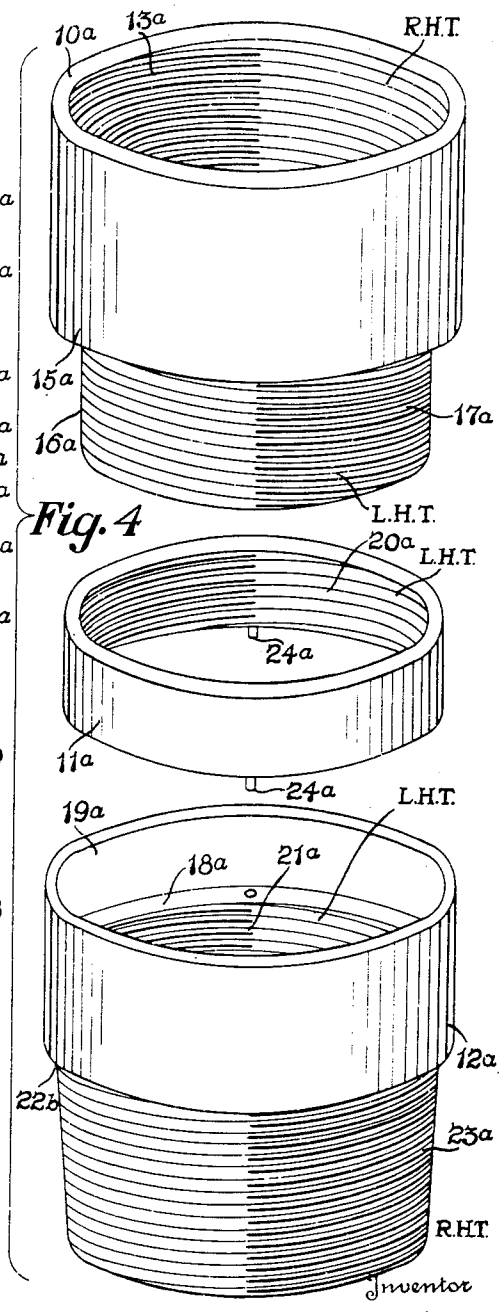


Fig. 4

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Patented Mar. 22, 1949

2,465,027

UNITED STATES PATENT OFFICE

2,465,027

RELEASE COUPLING FOR WELL CASINGS

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Application January 5, 1946, Serial No. 639,350

5 Claims. (Cl. 285—146)

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The invention relates to well casings and more particularly to a release coupling for such casings, and the present application is a continuation in part of my abandoned application Serial No. 561,691, filed November 3, 1944.

In the drilling of oil and gas wells, and the like, the lower section or sections of the casing or pipe sets in mud, settlings or cuttings, making it impossible to pull the casing or pipe without cutting or shooting it loose from the bottom section.

It has heretofore been common practice in seting a casing in a well to make up the last joint loose in the coupling so that after the casing has been allowed to set for the desired time the connection may be backed off.

Frequently the threads in the coupling become galled or crossed, so that considerable difficulty is sometimes experienced in breaking the connection, often resulting in backing the casing off at the wrong joint.

In order to overcome this difficulty what is known as a back-off tool is sometimes employed, but this requires considerable additional time and labor and is a troublesome operation, and if the threads are burred in coupling where the joint is broken out, it is very difficult to start new threads in it again.

When running a casing it sometimes happens that the bottom packer or shoe does not seal to cut the flow of water, and with the types of release couplings at present in use it is impossible to lift the entire string of casing to seal off the joint by mudding or cementing the bottom packer or shoe, because the rivets shear off when the casing is originally set on bottom so that it is impossible to pull it without pulling the coupling in two and causing all of the upper part of the casing to be taken from the hole, while the bottom section remains in the hole and requires a fishing job to pull it from sealing off the joint at the lower end.

Under present practice, when running a casing down, if the bottom of the casing strikes an obstruction the coupling is sometimes accidentally released causing considerable extra work and trouble, requiring that the entire casing be lifted and the bottom section removed by a fishing operation requiring extra time and labor.

It is an object of the present inventin to provide an improved release coupling by means of which the entire device is rigid and solid when running casing down so that if the bottom of the casing should strike an obstruction or tight place the coupling will not be accidentally released.

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Another object is to provide a release coupling which is fool proof and which requires a positive action by the drillers to release it.

Still another object of the invention is the provision of a release coupling which will permit the casing to be raised or lowered without releasing the coupling and in which there is no danger of the lower sections dropping down the hole since the release coupling will not accidentally release.

A further object is to provide a release coupling by means of which the lower section or sections of the casing may be quickly and easily released from the remainder of the casing in the event the lower section sets in mud, settlings or cuttings, making it impossible to pull the entire casing or pipe.

A still further object is the provision of a release coupling comprising upper and lower sections having regular tapered right hand pipe threads for connecting sections of well casing or pipe thereto, left hand threads being povided for connecting the two members of the coupling together and a collar being located between the members and connected to the upper member by means of the left hand threads.

Still another object of the invention is the provision of a release coupling of the character referred to in which the upper section of the coupling has internal pipe threads for receiving the usual pipe threads at the lower end of a length of well pipe or casing and the lower section of the coupling is provided with external pipe threads for insertion into the usual threaded collar at the upper end of a length of well pipe or casing.

The above objects together with others which will be apparent from the drawing and following description, or which may be hereinafter referred to, may be attained by constructing the improved release coupling in the manner illustrated in the accompanying drawings in which;

Figure 1 is a vertical, longitudinal section of a portion of well casing or pipe with the improved release coupling applied thereon;

Fig. 2 is an expanded, perspective view of the three parts of the improved released coupling;

Fig. 3 is a vertical, longitudinal section of a portion of well casing or pipe with a slightly modified form of the improved release coupling applied thereto; and

Fig. 4 is an expanded, perspective view of the three parts of the modified form of release coupling shown in Fig. 3.

Referring first to the form of the invention illustrated in Figs. 1 and 2, the improved release

coupling consists of three component parts, namely the upper member 10, the collar 11 and the lower member 12.

The upper member 10 has the usual inside, tapered, right hand pipe threads 13 within its upper portion, below which is the inside shoulder 14 and the outside shoulder 15. Below the shoulder 15 the member 10 is reduced as at 16 and provided with the outside left hand thread 17.

The lower edge of the collar 11 fits upon a machined seat 18 in the upper portion of the lower member 12 and upon the inside thereof, the outside of the collar 11 being machined to fit within the reduced upstanding flange 19 extending upwardly from the seat 18.

The inside of the collar 11 is provided with the internal left hand threads 20 which engage the external left hand threads 17 of the upper member 10.

The lower member 12 is provided with the internal left hand threads 21 below the seat 18, for engagement with the left hand threads 17 on the lower end portion 16 of the upper member 10 and may be provided midway of its length with the internal annular rib 22 below which the member 12 is provided with the regular inside tapered right hand pipe thread 23.

As shown quite clearly in Fig. 1, the inside left hand threads 20 of the collar 11 and the threads 21 of the lower member 12 are continuous and matched together so that the collar 11 and lower member 12 may be simultaneously screwed upon the external left hand threads 17 on the lower extension 16 of the upper section 10.

The collar 11 may be held in place within the collar seat of the lower section 12 as by pins 24 which may be located in the collar and lower section 12, preferably through the bottom of the collar and the seat 18 as shown in the drawings, although these pins may be radially located if desired.

An ordinary section of well casing or pipe indicated at 25 and provided with the usual tapered right hand pipe threads 26 may be screwed into the tapered right hand pipe threads 13 of the upper coupling member 10 and a similar ordinary section of casing 25' provided with the usual tapered right hand pipe threads 26' may be screwed into the tapered right hand pipe threads 23 of the lower section 12, in assembling the improved release coupling upon a well casing.

The coupling is assembled above ground with a gasket or packing 27 between the shoulder 15 of the upper section 10 and the upper edges of the lower section 12 and collar 11 to prevent leaks, by screwing the collar and lower section 12 tightly onto the upper section 10. The coupling is then connected to the upper and lower sections 25 and 25' of casing or pipe and the casing is run in the usual manner to the bottom of the hole.

If it is desired to draw or pull the casing, the casing is turned to the right, tightening all joints except the left hand thread joint in the coupling. The casing is turned until the threads 17 on the upper section 10 are screwed out of engagement with the threads 21 on the lower section 12.

At this point the collar 11 will still be fixed to the section 10 through the threads 17 and 20 when an upward pull upon the casing will separate the coupling. In the event the pins 21 are located radially through the collar and lower section 12 this upward pull will shear the pins permitting the coupling to separate.

The collar 11 being then mounted upon the lower end of the threaded extension 16 of the upper section 10 will prevent the threads from dropping together and will protect the threads on the upper section 10 while the casing is being pulled. Thus the casing is pulled free from the section or sections 25' set in the mud or settlings and all except the bottom section or sections of the casing can be easily pulled.

In the form of the invention above described and illustrated in Figs. 1 and 2, it will be obvious that the usual collar must be removed from the upper end of the lower length 25' of well pipe or casing in order that the pipe threads 26' thereon may be inserted into the internal pipe threads 23 of the lower section 12 of the release coupling.

For the purpose of providing means for attaching the lower section of the release coupling to the internal pipe threads upon this usual collar on the upper end of the well pipe or casing, the modified form of the invention, illustrated in Figs. 3 and 4, is provided.

Referring now to this form of the invention, the modified form of the improved release coupling consists of the three component parts, namely the upper member 10*a*, the collar 11*a* and the lower member 12*a*. The upper member 10*a* has the usual internal, tapered, right hand pipe threads 13*a* in its upper portion, below which is located the inside shoulder 14*a* and the outside shoulder 15*a*. Below the shoulder 15*a* the member 10*a* is reduced as at 16*a* and provided with the external, left hand threads 17*a*.

A machined seat 18*a* is formed in the upper portion of the lower member 12*a* and the lower edge of the collar 11*a* fits upon this seat, the exterior of the collar being machined to fit within the reduced, upright flange 19*a* which extends upwardly from the seat 18*a*. Inturned, left hand threads 20*a* are formed upon the inside of the collar 11*a* and engage the external, left hand threads 17*a* of the upper member 10*a*.

Internal, left hand threads 21*a* are provided on the exterior of the lower member 12*a*, below the seat 18*a*, for engagement with the external, left hand threads 17*a* on the lower end portion 16*a* of the upper member 10*a*, and said lower member may be provided midway of its length with the internal, annular shoulder 22*a* and the external annular shoulder 22*b*, below which the member 12*a* is externally reduced and tapered and provided with external, tapered, right hand pipe threads 23*a*.

Referring to Fig. 3, it is clearly seen that the internal, left hand threads 20*a*, of the collar 11*a*, and the internal, left hand threads 21*a*, of the lower member 12*a*, are continuous and matched together so that the collar 11*a* and lower member 12*a* may be simultaneously screwed upon the external, left hand threads 17*a* or the lower extension 16*a* of the upper section 10*a*.

For the purpose of holding the collar 11*a* in place within the collar seat of the lower section 12*a*, pins 24*a* may be located in the collar and the lower section 12*a*, preferably through the bottom of the collar and the seat 18*a*, as shown in Fig. 3, although if desired, these pins may be radially located through the collar and the lower member of the coupling.

A section of well casing or pipe, the lower end portion of which is indicated at 25*a*, is provided with the usual external, tapered, right hand pipe threads 26*a* which may be screwed into the tapered, internal right hand pipe threads 13*a* of the upper coupling member 10*a*, as shown in Fig. 3.

An ordinary section of well casing or pipe, the upper end portion of which is indicated at **25***b* in Fig. 3, and having the usual external, tapered, right hand pipe threads **26***b*, is provided with the threaded collar **28** usually mounted upon the upper end of each section of well casing or pipe.

This collar **28** is provided at its upper end with the usual internal, right hand, tapered pipe threads **29** which in ordinary practice receive the external pipe threads at the lower end of the next upper section of pipe or casing. These internal pipe threads **29** of the collar **28** may be screwed upon the tapered, external pipe threads **23***a* of the lower member **12***a* of the coupling in assembling the improved release coupling upon a well casing or pipe.

The coupling is assembled above ground, in the manner above described with reference to the form of the invention illustrated in Figs. 1 and 2, and a gasket or packing **27***a* may be located between the shoulder **15***a* of the upper member and the upper end of the lower member of the coupling to prevent leaks at this joint, and the coupling is connected to the pipe sections **25***a* and **25***b*, as above described, and the casing is run in the usual manner to the bottom of the hole.

If it becomes necessary to pull the casing, it is turned to the right, tightening all joints except the left hand thread joint in the coupling and the turning movement of the casing is continued until the threads **17***a* on the upper member **10***a* are screwed out of engagement with the threads **21***a* in the lower section **12***a*.

At this point the collar **11***a* will still remain fixed to the upper member **10***a* through the left hand threads **17***a* and **20***a* so that an upward pull upon the casing will separate the coupling members from each other. In cases where the pins **24***a* are located radially through the collar and lower member **12***a* this upward pull upon the casing will shear the pins permitting the coupling members to separate.

The collar **11***a* is then mounted upon the lower portion of the externally threaded extension **16***a* of the upper member **10***a* and will prevent the threads from dropping together and protect the threads on the upper member **10***a* while the casing is being pulled. Thus the casing is entirely free from the lower section or sections **25***b* of well casing or pipe, which is set in mud or settlings at the bottom of the hole, and all except this lower well casing or pipe section can be easily pulled.

From the above description of the form of the invention disclosed in Figs. 3 and 4 it will be obvious that it is not necessary to remove the usual threaded collar **28** from the upper end of the lower casing or pipe section **25***b*, but instead the internal, pipe threads **29** of this collar are screwed upon the tapered, threaded extension **23***a* of the lower coupling member.

It will be seen from the above that the entire device is rigid and fastened solidly when running casing down so that if the bottom of the casing should strike an obstruction or tight place in the hole the coupling will not be accidentally released. The coupling is absolutely fool proof as it requires a positive action by the drillers to release it.

In running the casing it is possible to raise or lower the casing without releasing the coupling permitting it to be driven past tight places without danger of releasing the coupling and allowing the lower section or sections to be dropped down into the hole.

Besides being entirely fool proof it will be seen

that when the casing is all in and the bottom section is set in the bottom of the hole, if for some reason it is desirable or necessary to pull all of the casing, for example where the water is not completely sealed off, the coupling may be released as above described and the casing pulled after which the bottom section or sections may be retrieved by means of fishing tools after which the whole apparatus can be reassembled and rerun.

It will also be evident that in running casing with the improved coupling, in the event the bottom packer or shoe does not seal to cut the flow of water, the entire string of casing may be released and by means of cementing or mudding the bottom packer or shoe the joint may be sealed off and the casing again lowered.

I claim:

1. A release coupling for well casing comprising an upper member having internal right-hand pipe threads in its upper portion for connection to a section of well casing and having external left-hand threads around its lower portion, a lower member having internal left-hand threads in its upper portion and an annular seat above said internal left-hand threads, and a collar located in said annular seat and having internal left-hand threads, the internal left-hand threads of the lower member and collar engaging the external left-hand threads on the upper member and right-hand pipe threads at the lower portion of the lower member for connection to a section of well casing.

2. A release coupling for well casing comprising an upper member having internal right-hand pipe threads in its upper portion for connection to a section of well casing and having external left-hand threads around its lower portion, a lower member having internal left-hand threads in its upper portion and an annular seat above said internal left-hand threads, and a collar located in said annular seat and having internal left-hand threads, the internal left-hand threads of the lower member and collar engaging the external left-hand threads on the upper member, pins engaging the collar and the lower member, and right-hand pipe threads at the lower portion of the lower member for connection to a section of well casing.

3. A release coupling for well casing comprising an upper member having internal right-hand pipe threads in its upper portion for connection to a section of well casing and having external left-hand threads around its lower portion, a lower member having internal left-hand threads in its upper portion and an annular seat above said internal left-hand threads, and a collar located in said annular seat and having internal left-hand threads, the internal left-hand threads of the lower member and collar engaging the external left-hand threads on the upper member and internal, right-hand pipe threads at the lower portion of the lower member for connection to a section of well casing, there being an external, annular shoulder on the upper member at the upper end of the left-hand threads thereon, the upper ends of the collar and of the lower member abutting said shoulder.

4. A release coupling for well casing comprising an upper member having internal right-hand pipe threads in its upper portion for connection to a section of well casing and having external left-hand threads around its lower portion, a lower member having internal left-hand threads in its upper portion and an annular seat above said

internal left-hand threads, and a collar located in said annular seat and having internal left-hand threads, the internal left-hand threads of the lower member and collar engaging the external left-hand threads on the upper member, pins engaging the collar and the lower member, and right-hand pipe threads at the lower portion of the lower member for connection to a section of well casing, there being an external, annular shoulder on the upper member at the upper end of the left-hand threads thereon, the upper ends of the collar and of the lower member abutting said shoulder.

5. A release coupling for well casing comprising an upper member having internal right-hand pipe threads in its upper portion for connection to a section of well casing and having external left-hand threads around its lower portion, a lower member having internal left-hand threads in its upper portion and an annular seat above said internal left-hand threads, and a collar located in said annular seat and having internal left-hand threads, the internal left-hand threads

of the lower member and collar engaging the external left-hand threads on the upper member and right-hand pipe threads at the lower portion of the lower member for connection to a section of well casing, there being an external, annular shoulder on the upper member at the upper end of the left-hand threads thereon, the upper ends of the collar and of the lower member abutting said shoulder, there being a gasket between said shoulder and the upper ends of the collar and of the lower member.

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