Aug. 16, 1932. C. J. POHL 1,872,182

PACKING DEVICE FOR USE IN CASING HEADS, OR THE LIKE

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Fig. 1.

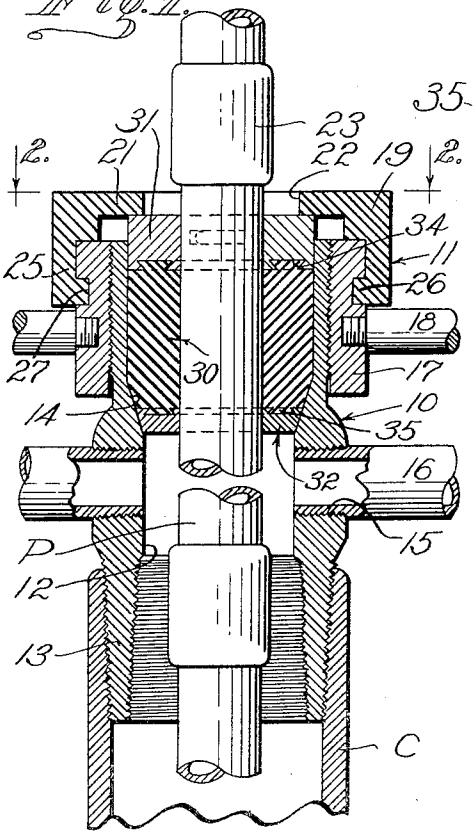


Fig. 3.

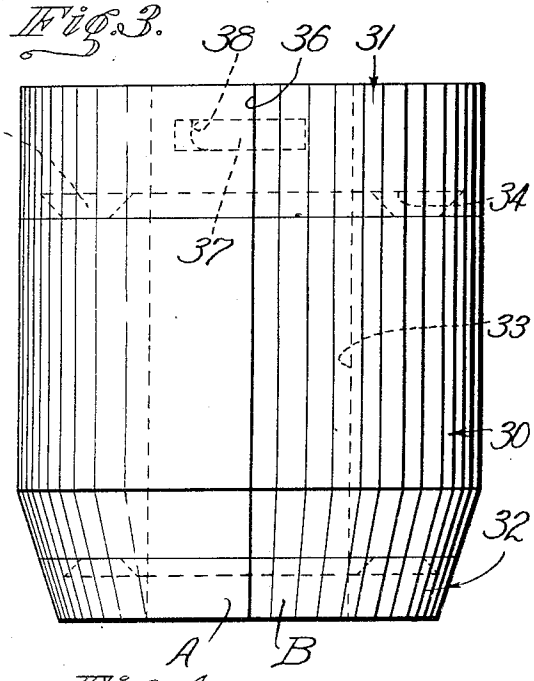


Fig. 4.

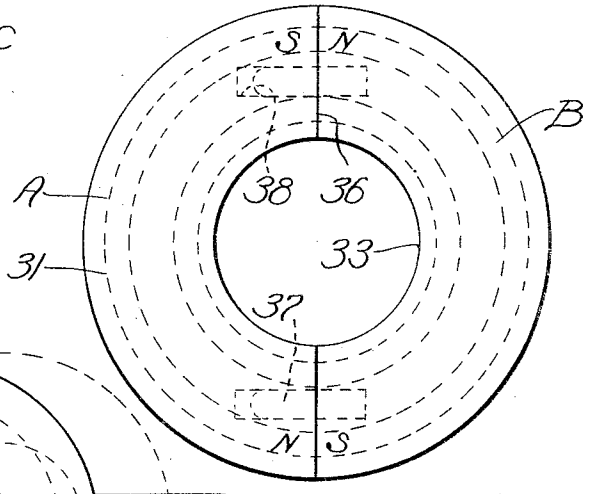
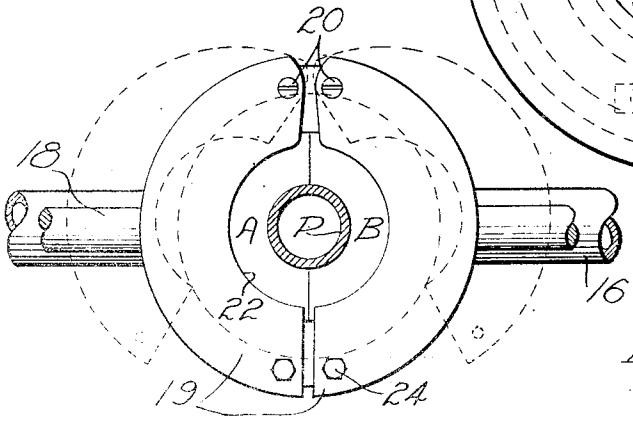


Fig. 2.



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PACKING DEVICE FOR USE IN CASING HEADS, OR THE LIKE

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Fig. 5.

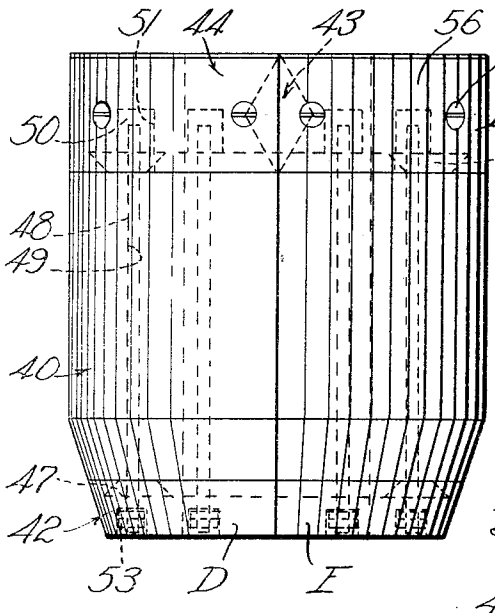


Fig. 6.

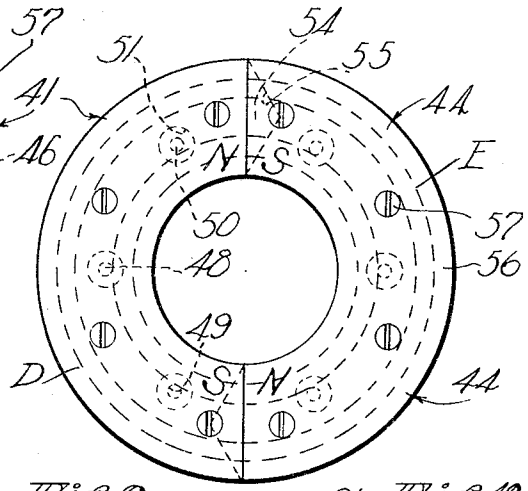


Fig. 9.

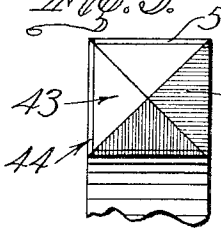


Fig. 10.

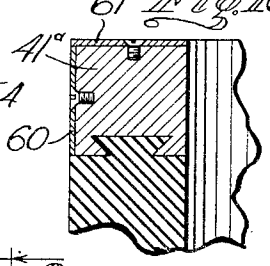


Fig. 7.

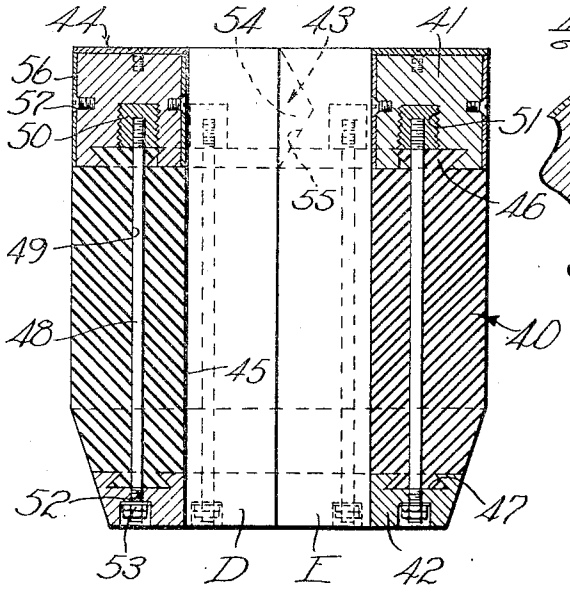
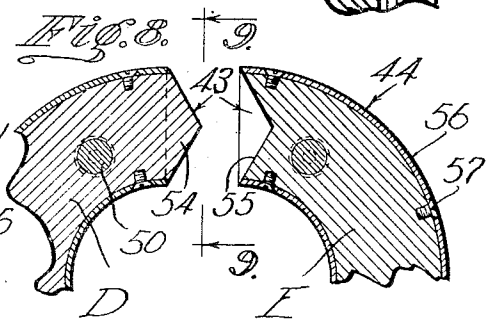


Fig. 8.



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Patented Aug. 16, 1932 1,872,182

UNITED STATES PATENT OFFICE

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PACKING DEVICE FOR USE IN CASING HEADS, OR THE LIKE

Application filed February 11, 1931. Serial No. 514,963.

This invention relates to a packing device and relates more particularly to a packing assembly for use in a casing head or blowout preventer at the upper end of a well casing. It is a general object of the invention to provide a simple, practical, and effective packing assembly that may be easily and quickly assembled around a pipe, or the like, extending from a well and arranged in operating position in a casing head, or the like, for sealing about the pipe.

Various types of packing devices are employed in casing heads, control heads, blowout preventers, etc., to pack around a string of drill pipe, or other object extending into the well, to seal off the upper end of the well casing. The majority of the common forms of packing devices employed in casing heads, and the like, are in the nature of split annular structures intended to be assembled around the pipe, extending into the well, and then lowered into the head. It has been found necessary to provide means for releasably connecting the abutting or adjoining ends of the sections of the packing devices to connect them together around the pipe or tool. Latches of various types have been employed for releasably connecting the sections of the packing devices. These latches and similar devices are usually difficult and inconvenient to operate and weaken and complicate the construction.

An object of the invention is to provide a packing device or packing assembly for use in a blowout preventer, control head, casing head, or the like, for sealing off the upper end of a well casing, that may be easily and quickly assembled around a pipe extending into a well, without the use of latches or other mechanical devices.

Another object of the invention is to provide a sectional packing device for use in a casing head or blowout preventer in which the sections are automatically assembled or connected around a pipe, or the like, upon their ends being brought together or in close proximity.

It is another object of the invention to provide a packing device of the character mentioned in which the sections are automatically connected and releasably held together by magnetism or magnetic forces.

Another object of the invention is to provide an embodiment in which the magnetized parts are separated or insulated from the casing head in which the device is to be used and from the pipe or tool which it packs about, and other parts which they may contact with by a sheathing of high magnetic reluctance, so that the device may be handled with ease.

It is another object of the invention to provide a packing device or assembly of the character mentioned in which the sections are automatically aligned and held in their proper alignment upon being assembled.

A further object of the invention is to provide a packing device of the character mentioned that may be embodied in forms for use in various types of casing heads, control heads, and blowout preventers, and for sealing about drill pipe, casing, and other objects.

The other objects and features of the invention will be best and more fully understood from the following detailed description of typical forms and applications of the invention, throughout which description reference is had to the accompanying drawings, in which:

Fig. 1 is a vertical detailed sectional view of a typical casing head or control head, being a view showing one form of the packing assembly in position therein and sealing about a string of pipe extending through the head. Fig. 2 is a top view or plan elevation of the control head, being a view taken as indicated by line 2—2 of Fig. 1. Fig. 3 is an enlarged side elevation of the packing device illustrated in Fig. 1. Fig. 4 is an enlarged top or plan view of the packing device. Fig. 5 is a side elevation of another form of the invention. Fig. 6 is a top or plan view of the device illustrated in Fig. 5. Fig. 7 is a vertical or longitudinal detailed sectional view of the device illustrated in Fig. 5. Fig. 8 is a fragmentary horizontal sectional view of the device illustrated in Figs. 5, 6, and 7 showing the end parts of the sections separated. Fig. 9 is a view of an end of one of the sections, being a view taken as indicated

by line 9—9 on Fig. 8, and Fig. 10 is a fragmentary sectional view of a part of another form of the invention.

The present invention is adapted to be embodied in forms for use in various types of well casing heads, blowout preventers, and the like, and for sealing about well casing, drill pipe, oil tubing or other objects extending into a well. Throughout the following detailed description the invention will be disclosed in typical forms suitable for use in a casing head of the general character fully described and claimed in my co-pending application entitled Control head, Serial Number 445,387, filed April 18, 1930. It is to be understood that the invention is not to be taken as limited or restricted to the particular forms or applications about to be described, but that it is to be taken as including any features or modifications that may fall within the scope of the claims.

The casing head or control head illustrated in Figs. 1 and 2 of the drawings is constructed so that the packing assembly may be actuated by the weight of a string of drill pipe P, or the like, extending into the well, or by mechanical compression means on the head. The control head illustrated includes, generally, a body 10 adapted to be mounted on the upper end of a well casing C, and means 11 for mechanically actuating or compressing a packing device to seal about the pipe P.

The body 10 of the control head is tubular, having a central longitudinal opening 12 for passing the drill pipe P, or the like, and for carrying a packing device. The lower end portion 13 of the body may be both internally and externally screw threaded for connection with the casing C. In the drawings I have illustrated the lower end 13 of the body screw threaded into the upper end of the casing. A downwardly and inwardly tapered shoulder 14 is provided in the opening 12 for supporting a packing device. The shoulder 14 is spaced some distance below the upper end of the body 10, and the upper portion of the opening above the shoulder may have straight cylindrical walls. Openings 15 are provided in the walls of the body 10 below the shoulders 14 to receive the ends of discharge conduits 16.

The means 11 for compressing or actuating the packing assembly includes a collar 17 screw threaded onto the upper end of the body 10. The collar 17 is detachably threaded onto the body and is provided with operating handles 18. A sectional compression member is provided on the collar 17 for engaging the upper end of the packing assembly to lock it in position in the opening 12 and for compressing or actuating the packing. The compression member consists of two like sections 19 pivotally mounted on the upper end of the collar 17. The sections 19 of the compression members are arcuate, being substantially semi-circular, and have adjacent ends pivotally mounted on the upper end of the collar 17 by pins or screws 20.

The pivoted ends of the sections 19 are curved and spaced apart so that the sections may be operated between the positions illustrated by the solid and broken lines in Fig. 2 of the drawings. Inwardly-projecting shoulders 21 are provided on the sections 19 to extend over the upper end of the opening 12 for engaging a packing device in the body. Semi-circular recesses 22 are provided in the inner edges of the flanges 21 to provide an opening for passing the pipe P and for permitting a coupling 23 on the pipe to engage the packing device. Bolts or pins 24 are adapted to be arranged in registering openings in the free ends of the sections 19 and the collar 17 to releasably retain the sections in the operative position. Downwardly-projecting flanges 25 are provided at the peripheries of the sections 19 to surround the upper end portion of the collar 17. Internal or inwardly-extending ribs or tongues 26 are provided on the flanges 25 to cooperate with grooves 27 in the collar. The ribs 26 are semi-circular and are adapted to cooperate with the annular grooves 27 to lock the sections 19 against longitudinal movement on the compression collar 17. It will be apparent how the sections 19 may be arranged, as illustrated in the drawings, to engage a packing device, and how the compression collar 17 may be threaded onto the body to actuate the packing device.

The form of packing assembly or packing device provided by the present invention and illustrated in Figs. 1 to 4, inclusive, is in the nature of an annular structure adapted to be arranged in the opening 12 to seal about the pipe P. This embodiment of the invention includes, generally, two sections A and B formed of a longitudinally-split annular body 30 of packing, and split collars 31 and 32 at the ends of the packing 30.

The packing 30 is a sectional annular body of rubber or other suitable packing material arranged between the collars 31 and 32. The packing 30 is longitudinally split at diametrically opposite points into two like or semi-circular sections. The packing 30 is proportioned to slidably fit into the upper end of the opening 12 of the casing head body and its lower portion may be downwardly and inwardly tapered to cooperate with the tapered shoulder 14. The opening 33 in the packing 30 is adapted to normally freely pass the drill pipe P or other object that the device is intended to seal about.

The collar 31 is provided at the upper end of the packing 30, while the collar 32 is provided at the lower end of the packing 30.

The collars 31 and 32 are longitudinally split at diametrically opposite points and are arranged so that the ends of their sections are in alignment with the ends of the sections of the packing. The upper collar 31 may have the same internal and external diameters as the packing 30 to pass the pipe P and to fit into the opening 12. The top or upper end of the collar 31 is preferably flat to receive the flanges 21 or a pipe coupling 23. The packing assembly is proportioned so that the upper collar 31 normally projects from the upper end of the body 10, as illustrated in Fig. 1. The lower collar 32 is provided to cooperate with the tapered shoulder 14 to support the assembly in the head, and its exterior or periphery is tapered downwardly and inwardly to effectively cooperate with the shoulder. The lower collar 32 may be of the same internal diameter as the packing 30 and collar 31. The lower end of the collar 32 is preferably flat to effectively receive a coupling on the pipe P in the event that the pipe is forced or pulled outwardly to actuate the packing.

In accordance with the broader aspects of the invention, any suitable means may be provided for connecting or assembling the parts of the sections A and B. In the simple form of the invention illustrated in Figs. 1 to 4 of the drawings, circular dovetailed grooves 34 are provided in the inner ends of the collars 31 and 32 to receive dovetailed ribs 35 on the ends of the packing 30.

The present invention provides novel and improved means for releasably connecting the sections A and B of the device so that it may be easily and quickly assembled about a pipe P, or the like, and lowered into operative position in the opening 12. In accordance with the invention, one or both of the collars 31 and 32 are magnetized so that upon the sections A and B being brought together they are held together or connected by a magnetic force. In practice, a single collar, for example, the upper collar 31, may have one or both of its parts or sections magnetized. In the preferred construction the upper collar 31 is the active or holding member of the assembly as it is of greater dimensions and presents larger abutting ends than does the lower collar 32. In accordance with the broader principles of the invention, either one or both of the sections of the collar 31 may be in the form of a permanent magnet. In the event that both the sections of the upper collar 31 are permanently magnetized, they are positioned and related so that their abutting ends have opposite magnetic polarity, i. e., the north pole or end of one section will oppose or abut the south pole of the other section and have its south pole opposite the north pole of the said other section, as illustrated in Fig. 4 of the drawings. When both of the sections of the collar 31 are permanently magnetized, they exert a maximum magnetic force upon one another to tightly hold the sections A and B of the assembly together.

In the event that it is found practical to construct the device with only one of the sections of the collar permanently magnetized, the other section of the collar acts as the armature or keeper for the permanently magnetized part and is effectively connected with the permanently magnetized section when the sections A and B are brought together. The sections of the collar 31 being semi-circular, are similar, generally, in configuration to the "horseshoe" type of magnet, and when permanently magnetized, form effective magnets. The active or connecting collar 31 of the assembly may be formed of a suitable hardened steel, or the like, so that the magnetic charges of its sections are held or retained for a long period. The abutting ends 36 of the sections of the collar 31 forming the poles of the magnetic forces may be flat and radial to have large cooperating surfaces. It will be obvious that when both the sections of the collar 31 are permanent magnets, one section forms the armature or keeper for the other, and a complete circuit is formed when the device is assembled. Also when only a single section of the collar 31 is permanently magnetized, the other section forms the keeper or armature, so that a complete, effective magnetic circuit is formed. When the device is not in use, it is preferred to keep the ends or poles of the sections of the collar 31 in abutment so that the sections operate as keepers or armatures to preserve their magnetism. It will be readily apparent how the sections A and B may be easily and quickly connected together about the pipe, or the like, upon being brought together, and how the device may be slid down the pipe P, or the pipe P may be lowered to lower the device into the opening 12.

The present invention provides means for aligning the sections A and B and for locking the sections A and B against relative longitudinal and radial movement upon being connected magnetically in the manner described. The aligning or locking means may be provided on either one or both of the collars 31 and 32. In the simple form of the invention illustrated, the aligning and locking means is provided on the upper collar 31 and includes lugs or pins 37 projecting from the ends or poles of one section of the collar 31 to cooperate with sockets 38 in the ends of the other section. The outer ends of the pins 37 may be rounded so as to readily pass into the sockets 38 upon the sections A and B being assembled. The pins 37 cooperate with the sockets 38 to automatically align the sections A and B upon the device being assembled and operate to positively hold the sections A and

B against relative longitudinal and radial shifting.

It is believed that the utility and operation of the form of the invention illustrated in Figs. 1 to 4, inclusive, of the drawings will be readily apparent from the foregoing description. During normal operation of the well tools the compressing collar 17 may be removed from the body 10 of the head, or the locking sections 19 may be swung to an out position such as indicated by the broken lines in Fig. 2 of the drawings, so that the drilling operations are not in any manner interfered with. When it is desired to control the well by packing off around a drill pipe P, or the like, the sections A and B of the packer or packing assembly are brought together around the pipe P at a point above the head. The magnetism of the section or sections of the upper collar 31 operates to tightly connect the sections A and B around the pipe. Further, the drill pipe P may act as a core and be acted upon by the magnetic fields, so that the packing assembly is secured to the pipe. The drill pipe P may then be lowered to bring the packing assembly into operating position in the body 10 of the head, or the packing assembly may be forced downwardly on the pipe to seat on the shoulder 14. The packing assembly may then be actuated in any suitable manner to seal about the drill pipe P, or the like.

The packing may be expanded or actuated by allowing the weight or a portion of the weight of the string of drill pipe to be supported on the packing assembly through a coupling 23 engaging or seated on the upper end of the collar 31. The packing may be mechanically actuated by positioning the locking sections 19 to extend over the upper end of the opening 13 and threading the collar 17 downwardly to compress the packing 30. The form of the invention illustrated in Figs. 1 to 4 of the drawings provides a simple, inexpensive packing assembly or packer that may be effectively connected together for insertion in a casing head, or the like, and that does not embody latches or complicated and expensive means for holding its sections together. The section or sections of the upper collar 31, being permanently magnetized, act to automatically connect and hold the sections A and B assembled upon the sections A and B being brought together. The device may be removed from the head by raising the string of pipe P or by engaging the sections A and B and forcibly raising them upward. The sections may be disconnected by striking the device a blow or by forcibly pulling the sections A and B apart.

The embodiment of the invention illustrated in Figs. 5 to 9, inclusive, of the drawings is similar, generally, to the form of the invention described and includes means for preventing the lines of magnetic force of the magnetized collar from passing into objects of magnetic material with which it may come into contact. The form of the invention shown in Figs. 5 to 9, includes, generally, two sections D and E formed of a split annular body of packing 40 and split collars 41 and 42 at the ends of the packing. This embodiment of the invention also includes means 43 for holding the sections A and B in alignment, and sheathing means 44 for the magnetized collar 41.

The sections D and E are similar, generally, to the sections A and B described above, i. e., they are semi-circular structures adapted to be connected together around a drill pipe to form an annular assembly for use in a casing head, or the like, to seal off the upper end of a well casing. The packing 40 is an annular body of rubber or rubber composition and is longitudinally split at diametrically opposite points into two separable parts. The packing 40 is proportioned to fit into the opening of a casing head, or the like, and the opening 45 in the packing is adapted to normally pass the object about which the device is to be assembled. The lower end portion of the packing 40 may be tapered downwardly and inwardly to seat on a tapered shoulder in the casing head or control head.

The collars 41 and 42 correspond in structure and purpose to the collars 31 and 32 described above. The collars 41 and 42 are longitudinally split at diametrically opposite points and are arranged to have their ends in alignment or register with the ends of the sections of packing 40. The exterior or periphery of the lower collar 42 is tapered downwardly and inwardly to seat on a shoulder in the body of the control head. The openings in the collars 41 and 42 may be of substantially the same diameter as the opening 45 in the packing. Dovetailed circular ribs 46 may be provided at the opposite ends of the packing 40 to fit into correspondingly shaped grooves 47 in the inner ends of the collars to provide effective connections between the packing and collars.

The embodiment of the invention being described includes means for loosely connecting the collars 41 and 42 at the opposite ends of the assembly. Rods 48 extend between the collars 41 and 42. The rods 48 extend through longitudinal openings 49 in the packing 40 and have their upper ends attached to the collar 41. The upper ends of the rods 48 may be screw threaded into sockets or nipples 50 of non-magnetic material. The nipples 50 are screw threaded into sockets 51 in the collar 41. The lower ends of the rods 48 slidably pass through openings 52 in the lower collar. Heads in the form of nuts 53 may be provided on the lower ends of the rods 48 to slidably fit enlarged portions of the openings 52. The rods 48 slidably fit the openings 49

and 52 so that the packing 40 is free to expand and flex.

The means 43 for holding the sections D and E against relative longitudinal and radial shifting when assembled together includes intermeshing or overlapping parts at the abutting ends of the sections of the collar 41. The means 43 includes a projection 54 at one end of each section of the collar 41 for cooperating with a socket 55 in an end of the other section. The projections 54 may be conical or pyramidal, and the sockets 55 may be of corresponding configuration to receive the projections. The bases of the pyramidal projections 54 and sockets 55 occur at the diametric lines of division of the collar 41, so that the sections of the collar are adapted to fit together to form an annular or circular assembly. When the sections A and B are assembled together, as illustrated in Figs. 5, 6, and 7 of the drawings, the projections 54 cooperate with the sockets 55 to effectively hold the sections D and E against relative longitudinal and radial movement.

In accordance with the invention, the sections D and E are adapted to be connected or releasably held assembled by magnetic forces. One or both of the parts of the upper collar 41 may be permanently magnetized to hold the sections D and E assembled. When one part of the collar 41 is permanently magnetized, the other part of the collar is attracted to it, and, when brought into close proximity to it, is brought into contact with it, so that it forms an armature or keeper for the magnetized part. When both the sections of the collar 41 are permanently magnetized, they are charged or related so that their abutting ends are in opposed or opposite magnetic polarity, i. e., the north pole or end of one section of the collar is opposite and abuts the south pole of the other collar, as indicated by the letters S and N in Fig. 6 of the drawings. When both the parts or sections of the collar 41 are permanently magnetized as described above, they form armatures for one another when the sections D and E are assembled, so that a complete magnetic circuit is obtained. It will be apparent how the magnetized section or sections of the collar 41 operate to connect the sections D and E when brought together and act to hold the sections of the device assembled. If found desirable or practical, the faces of the pyramidal projections 54 and/or the faces of the sockets 55 may be rounded.

The sheathing means 44 is provided to cover the magnetized collar 41 with a material of high magnetic reluctance so that the collar proper cannot come into direct contact with the casing head in which the device is used, the pipe extending through the head, or any other object. The means 44 is in the nature of a covering or sheathing of a suitable non-magnetic material on the exposed or free parts of the collar 41, and includes a covering 56 of brass or other suitable material of high magnetic reluctance on the periphery, the upper side, and the interior of the collar 41. The covering or sheathing 56 preferably completely covers the periphery of the collar so that it separates the magnetized collar from the body of the head in which it is to be used. The sheathing at the top of the collar may completely cover the upper side of the collar to space the collar from the compression means on the casing head and the couplings, etc., on the drill pipe on which the device is assembled. The sheathing of non-magnetic material of the interior of the collar effectively prevents direct contact of the magnetized collar with the metallic or ferrous pipe, or the like, on which it is assembled. The sheathing 56 may be made in separate parts or sections for covering the separate faces of the collar 41, and may be secured to the collar by suitable screws 57. The nipples 50 are formed of a non-magnetic material such as brass, or the like, and prevent direct contact of the collar 41 with the connecting rods 48. The rubber packing 40 acts to prevent the lines of magnetic force from passing from the upper collar 41 to the lower collar 42.

The form of the invention illustrated in Fig. 10 of the drawings includes a sheathing 60 of material of high magnetic reluctance arranged on the periphery of the magnetized collar 41^a, and a covering or sheathing 61 of high magnetic reluctance material on the top or upper side of the collar 41^a. The interior or inner wall of the collar 41^a is adapted to directly engage the object about which the packer is assembled, so that it is secured to the object by the magnetic force of the collar 41^a.

The embodiment of the invention illustrated in Figs. 5 to 9, inclusive, of the drawings is adapted to be assembled around a drill pipe, or the like, and then lowered to operating position in the head. The magnetized upper collar 51 operates to automatically connect the sections D and E and to hold them assembled around the pipe. The sheathing 56 in the inner walls of the collar 41 separates the collar from the pipe so that the device may be readily slid down the pipe into the casing head. The sheathing 56 insulates the magnetized collar 41 from the body of the casing head or control head and from the pipe about which the device is assembled, so that the magnetic forces in the collar are directed in a path within the collar and are centralized or concentrated at the ends or poles of the collar sections. Further, the sheathing 56 separates the magnetized collar from the body of the head, so that the device may be readily removed or pulled out of the head when desired.

The form of the invention illustrated in

Fig. 10 of the drawings is adapted to be assembled on a drill pipe, or the like, and the magnetism of the collar 41 connects it with the pipe. The packing assembly may be lowered into operative position in the casing head by lowering the pipe P a suitable distance into the well to bring the packing assembly into the proper position. The sheathing 60 is formed of brass, or the like, and separates the magnetized collar from the casing head so that the head may be easily and quickly arranged in and removed.

Having described only typical preferred forms of my invention, I do not wish to limit myself to the specific details set forth, but wish to reserve to myself any changes or variations that may appear to those skilled in the art or fall within the scope of the following claims:

Having described my invention, I claim:

1. A packing device of the character described including two sections, each section including a part of magnetic material, and packing associated with the part, the said part of one section being magnetized and adapted to abut the part of the other section to connect the sections.

2. A packing device of the character described including a sectional annular assembly having its sections held together by magnetic force.

3. A packing device of the character described including a sectional annular assembly, a part of magnetic material on one section, and a magnetized part on another section to cooperate with the first mentioned part.

4. A packing device of the character described including an annular sectional assembly including two sections, each section comprising packing, and a collar part associated with the packing, the collar part of one section being magnetized to cooperate with the collar part of the other section.

5. A packing device for use in a casing head including, an annular body of packing and a collar at one end of the packing, the assembly of the packing and collar being longitudinally split into two separable sections, the collar part of one section being magnetized to connect with the collar part of the other section.

6. A packing device for use in a casing head including, an annular body of packing and a collar at one end of the packing, the assembly of the packing and collar being longitudinally split into two separable sections, the collar parts of the sections being permanently magnetized and being related so that their abutting ends have opposed magnetic polarity.

7. A packing assembly for use in a casing head including two substantially semi-circular sections adapted to be assembled together around an object, each section including packing, and a substantially semi-circular collar part at an end of the packing, the collar part of one section being magnetized to attract and connect with the collar part of the other section.

8. A packing assembly for use in a casing head including two substantially semi-circular sections adapted to be assembled together around an object, each section including packing, and a substantially semi-circular magnetized collar part at one end of the packing.

9. A packing assembly for use in a casing head including two sections adapted to be assembled together around an object, each section including a body of packing, a collar part at one end of the packing, and a magnetized collar part at the other end of the packing.

10. In combination, a casing head body having an opening for passing well tools, and a packing device adapted to be positioned in the opening to seal about a well tool, the packing device including two separable sections adapted to be assembled around a well tool, each section including a body of packing, and a collar part, the collar part of one section being magnetized.

11. In combination, a casing head body having an opening for passing well tools, and a packing device adapted to be positioned in the opening to seal about a well tool, the packing device including two separable sections adapted to be assembled around a well tool, each section including a body of packing, and a magnetized section of a collar at an end of the packing.

12. In combination, a casing head body having an opening for passing well tools, and a packing device adapted to be positioned in the opening to seal about a well tool, the packing device including two separable sections adapted to be assembled around a well tool, each section including a body of packing, a collar part, one of the collar parts being magnetized, and sheathings of high magnetic reluctance for the collar parts.

13. In combination, a casing head body having an opening for passing well tools, and a packing device adapted to be positioned in the opening to seal about a well tool, the packing device including two separable sections adapted to be assembled around a well tool, each section including a body of packing, a collar part, one of the collar parts being magnetized, and material of high magnetic reluctance for separating the collar parts from the casing head body.

14. In combination, a casing head body having an opening for passing well tools, and a packing device adapted to be positioned in the opening to seal about a well tool, the packing device including two separable sections adapted to be assembled around a well tool, each section including a body of

packing, a collar part, one of the collar parts being magnetized, and material of high magnetic reluctance for separating the collar parts from the casing head body and the object.

15. A packing device for use in a casing head including, an annular body of packing and a collar at one end of the packing, the assembly of the packing and collar being longitudinally split into two separable sections, the collar part of one section being magnetized to connect with the collar part of the other section, and a sheathing of high magnetic reluctance for said collar.

16. A packing device for use in a casing head including, an annular body of packing and a collar at one end of the packing, the assembly of the packing and collar being longitudinally split into two separable sections, the collar part of one section being magnetized to connect with the collar part of the other section, and means for holding the sections against relative longitudinal movement.

17. A packing device for use in a casing head including, an annular body of packing and a collar at one end of the packing, the assembly of the packing and collar being longitudinally split into two separable sections, the collar part of one section being magnetized to connect with the collar part of the other section, and means for holding the sections against relative longitudinal movement, said means including interlocking parts at the ends of the collar parts.

18. A packing device for use in a casing head including, an annular body of packing and a collar at one end of the packing, the assembly of the packing and collar being longitudinally split into two separable sections, the collar part of one section being magnetized to connect with the collar part of the other section, and a sheathing of material of high magnetic reluctance on the periphery of the collar.

19. A packing device for use in a casing head including, an annular body of packing and a collar at one end of the packing, the assembly of the packing and collar being longitudinally split into two separable sections, the collar part of one section being magnetized to connect with the collar part of the other section, the collar parts of the two sections being magnetized, and a sheathing of material of high magnetic reluctance for the collar.

In witness that I claim the foregoing, I have hereunto subscribed my name, this 4th day of February, 1931.

CHARLES J. POHL.