

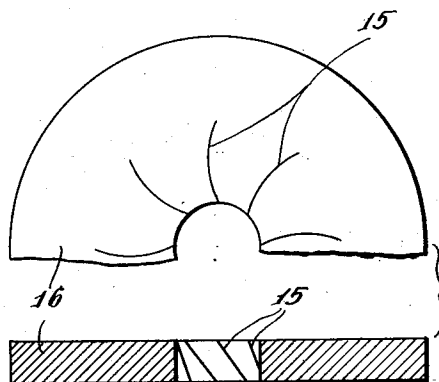
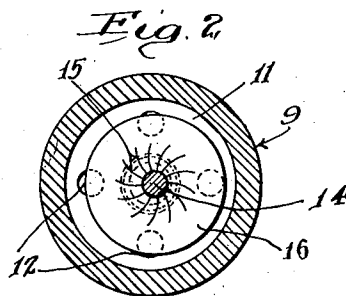
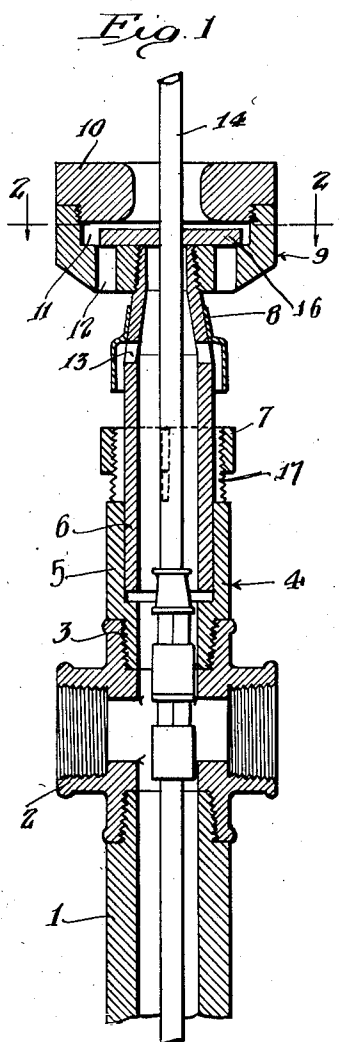
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WIPER DEVICE

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UNITED STATES PATENT OFFICE

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WIPER DEVICE

Application filed October 19, 1927. Serial No. 227,085.

This invention relates to a wiping device and oil saver. The invention relates particularly to a wiping device adapted to encircle sucker rods, tubing, cable and the like and to wipe off the oil clinging to said rods or cable when such rods or cable are being withdrawn from wells, particularly oil wells and, therefore, prevent such oil being wasted.

The general object of this invention is to provide a wiping device of simple construction which will operate effectively to wipe the oil from the sucker rod, tubing or cable as it passes out of the well and out of the casing or flow pipe and which wiping device is so constructed as to adapt itself to changes in cross section of the sucker rod, cable or tubing, portions of which are sometimes angular in form or of increasing diameter such as, for example, appurtenances which are part of the sucker rod, tubing or cable. Another object is to provide a device of this kind which will present a continuous wiping surface to the rod or cable notwithstanding rapid or large changes in the cross section of the rod or cable or appurtenances. Another object is to disclose a device in which the wiper is positioned, such device being attached to the casing or flow pipe of the well, in such a way as to enable it to disconnect itself automatically when struck by the tools carried by the sucker rod or cable.

As usually constructed, a wiper for a sucker rod is made of some soft resilient material, such as rubber, and provided with a central opening through which the sucker rod passes. It has been customary to secure this wiper in a fixed position. However, this is objectionable because in pulling the rod, the rod tends to wobble or move laterally as it is being pulled. This produces a great amount of wear on the opening through the wiper and reduced the period of usefulness. According to our joint invention disclosed in our co-pending application filed September 16, 1926, Serial Number 135,801, we provide means for holding the wiper in contact with the rod, but we construct this means in such a way as to permit free lateral movement of the wiper as the rod wobbles laterally. We also support the wiper box or casing in such a way

that when the plunger of the sucker rod arrives at the mouth of the well, the wiper box or casing will detach itself automatically from the flow pipe.

The particular form of wiper which we have invented and which may be used in the apparatus disclosed in our co-pending application mentioned above or in any other suitable oil saving device, comprises a disk of some soft resilient material such as rubber and the like, provided with a central opening adapted to receive the rod tubing or cable to be wiped. This central opening is preferably somewhat smaller than the smallest diameter of the cable or rod to be wiped. Furthermore, the wiper is radially cut from its inner opening, the cuts or slits extending in a general radial direction although they may be of slightly curved or arcuate form. These cuts, however, are not vertical, that is, are not perpendicular to the plane of the wiper disk or parallel to the cable or tubing passing through the central opening in the wiper, but instead they are inclined and disposed at an angle to the plane of the wiper. This novel construction allows the individual tongues formed by said cuts to slide upon each other without opening the slits when an enlargement in the rod or cable passes through the wiper and thereby a continuous uninterrupted surface is continuously presented by the wiper and effectively and completely removes the oil clinging to said rod or cable or enlargements therein. The method of using our oil saving device and wiper will be readily understood by referring to the attached drawing:

Figure 1 is a vertical section through the upper end of a flow pipe provided with one form of oil saving device containing our improved wiper;

Figure 2 is a horizontal cross section through the wiper box or casing taken on the line 2—2 of Figure 1;

Figure 3 is an enlarged view of a portion of one form of wiper.

Figure 4 is a vertical section through the wiper illustrating another embodiment of the invention.

According to our invention we construct

the wiper disk with a central opening and with a plurality of tongues projecting inwardly toward the central opening, and the disk is constructed so that the edges of the
5 tongues overlap each other, so that if the rod or cable running through the opening enlarges the opening, the tongues can move to enlarge the opening without producing spaces between the edges of the tongues.
10 We shall now describe the preferred embodiment of the invention.

Referring to the drawing, the well pipe or flow pipe 1 is provided with a 4-way T 2 which in turn is connected by screw threads
15 3 to a cap 4 having a socket 5 to receive the lower end of a guide 6. The guide 6 is frictionally and detachably retained within the cap 4 by means of wing nuts or by means of a collar 7 engaging tapered and externally
20 threaded, vertically slotted extensions 17 of the cap 4. The internal diameter of the guide 6 is preferably the same as the internal diameter of the flow pipe 1 so as to receive freely the sucker rod, cable and other tools attached thereto which may be used in drilling,
25 swabbing or pumping and other operations. The upper end of the guide 6 has a casing portion 8 so that the internal diameter of the casing 8 at its upper end is sufficiently large
30 to enable the sucker rod, cable and smaller joints or enlargements to pass through but to prevent the passage of the plunger or other working tool usually found at the bottom of a working string of tools.

35 The upper end of the casing end is firmly connected by means of screw threads or other suitable means to a wiper casing or wiper box 9 provided with a cap 10 attached thereto by suitable means. Between the
40 lower wiper box 9 and the cap 10 a wiper chamber 11 is formed which exceeds in size the dimensions of the wiper 16 loosely retained therein. The lower section of the wiper box is preferably provided with openings
45 12 to enable oil removed from the sucker rod, cable or tubing by the wiper to be discharged from the wiper box. The upper cap 10 is provided with rounded lower and upper corners as indicated in the drawing for
50 the purposes hereinafter described.

The guide 6 is also preferably provided with openings 13 near the point at which the internal diameter of the guide is reduced so as
55 to enable oil present in this section of the guide bore to readily escape.

The wiper 16 is preferably in the form of a disk having a centrally disposed opening through which the sucker rod, cable, tubing and appurtenances 14 may pass. This central
60 opening is preferably of smaller minimum diameter than the smallest diameter of the sucker rod, cable, or tubing passing through said opening so as to exert a positive wiping action upon said rod or cable at all
65 times. The wiper 16 may be made of one c.

more sheets of soft resilient material such as rubber or other flexible composition and containing a plurality of cuts extending from the centrally disposed opening into the body of the wiper in a more or less radial direction as
70 shown in Figures 2 and 3. The material between the cuts constitutes a plurality of tongues projecting inwardly. These cuts 15 are inclined, that is, they are at an angle to the plane of the wiper, an angle of 45° having
75 been found to work satisfactorily although angles of from 15 to 75° may be used. When the wiper is constructed of more than one piece of material the cuts in these sections are preferably so position as to cause
80 an overlapping of the tongues made by such cuts. This construction obviates any possibility of oil seepage taking place between the wiper tongues.

The disk forming the wiper should be relatively thin, that is, thin enough to permit the tongues to flex and enlarge the opening,
85 but without forming open spaces through the disk at the slits 15.

With this construction, it will be evident
90 that any transverse or lateral movement of the sucker rod, or cable, within the guide or flow pipe will be freely transmitted to the wiper within the wiper chamber and will permit the wiper to follow the rod or cable in any position that it may assume. This prevents any continuous friction between the rod and the inner edge of the centrally disposed opening in the wiper and uniformly
95 distributes the friction around this edge. As the sucker rod or cable passes up out of the flow pipe and through the device, oil which is wiped off by the wiper passes down through the openings communicating with the wiper chamber in the lower portion 9 thereof. The
100 tongues formed by the various cuts in the wiper 16 are very effective in wiping the oil off the rod or cable and furthermore, will adapt themselves and the size of the centrally disposed opening in the wiper to any shape or size that the sucker rod or cable may have at any portion of its length. Furthermore,
105 during the upward passage of the sucker rod, for example, through the wiper, enlargements in the sucker rod such as buttons or
110 joints, will cause the tongues of the wiper disc to flare upwardly and into the central opening of the upper cap 10 and in this way centralizes the sucker rod within the guide and has a tendency to prevent the rod from
115 wobbling or pulling to one side. The same action also acts as a stop to prevent oil and gas blowing out of the well when pulling the rod although the 4-way T generally provided
120 between the flow pipe and the device takes care of all such oil. When the plunger or other tool carried by the rod or cable enters the guide at its upper constricted section it comes in contact therewith and no injury can
125 be done to the guide or the wiper box because
130

the blow will simply cause the guide 6 to move upwardly and detach itself from the socket

wiper, without forming open spaces at the cuts.

5 This device therefore, increases the safety of the workmen as it avoids the necessity for a man standing near ascending rods and tools, as is necessary when the rod or cable is wiped by hand. In Figure 4 we illustrate an embodiment of the invention in which a plurality of disks 16a are employed superposed upon each other. In this view 15a indicates the slits corresponding to the slit 15 of the single disk shown in Figure 3, and the dotted lines 15b indicate the slits of the disks that are below the uppermost disk. In this view 15 the different slits 15b are represented as equidistant from each other, but it should be understood that this would not necessarily be their arrangement if used in practice. However, by employing a sufficient number of disks, the slits will be sufficiently out of line with each other to insure effective operation of the wiper.

Although we have described in detail one form of oil saving device in which our oil wiper may be used, we do not desire to be limited to this particular adaptation of our invention which is here concerned chiefly with the wiper disk and its construction. Various modifications and changes may be made in the wiper disk and it is understood that our invention embraces all modifications and changes which fall within the scope of the appended claims. The invention may be practiced by providing a plurality of wiper disks of the type illustrated in Figure 3, juxtaposed upon each other. This is illustrated in Figure 4 in which figure 15a indicates the slits in the disks which slits have the same character as the slits 15 already described. In Figure 4, 16a indicates the separate disks that cooperate to form the complete wiper.

We claim:

1. As a new article of manufacture, a wiper comprising a disk of soft rubber, having a centrally disposed opening in said disk and a series of cuts extending from said central opening into the disk, said cuts being made in planes inclined at an angle to the plane of said disk, passing part way from the central opening to the periphery of the disk, and operating to flex when an enlarged portion of the reciprocating rod passes through the wiper, without opening spaces through the disk.

2. As a new article of commerce, a wiper comprising a plurality of superimposed disks of a soft resilient material, centrally disposed openings in said disks and a plurality of cuts extending from the centrally disposed opening into the disks, said cuts in one disk not coinciding with cuts in a superimposed disk and said cuts giving each disk a plurality of tongues operating to flex when an enlargement on the packed part passes through the

3. As a new article of manufacture, a wiper for wiping the surface of a reciprocating rod or cable, consisting of a relatively thin disk of resilient material having a central opening through which the rod or cable passes, said disk having a plurality of flexible tongues projecting radially inward at said opening, with the side edges of the tongues of the disk overlapping each other, said disk constructed relatively thin so that the central opening may be enlarged by an enlargement on the rod or cable without opening spaces between the tongues.

4. As a new article of manufacture, a wiper for a reciprocating rod comprising a resilient substantially flat body portion having a centrally disposed opening, and having a series of cuts passing through the same diverging from each other in a general radial direction, and extending part way to the periphery of the wiper from said central opening, said cuts being made in planes inclined to the planes of said body portion and forming inwardly projecting tongues adapted to flex when an enlarged portion on a reciprocating rod passes through the wiper, without opening spaces between the tongues.

Signed at Santa Maria, Calif., this 11th day of October, 1927.

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WILLIAM F. BREEN.