July 12, 1960 R. M. RUSH 2,944,608

CENTRALIZING SPIDER FOR WELLS

Filed March 25, 1958

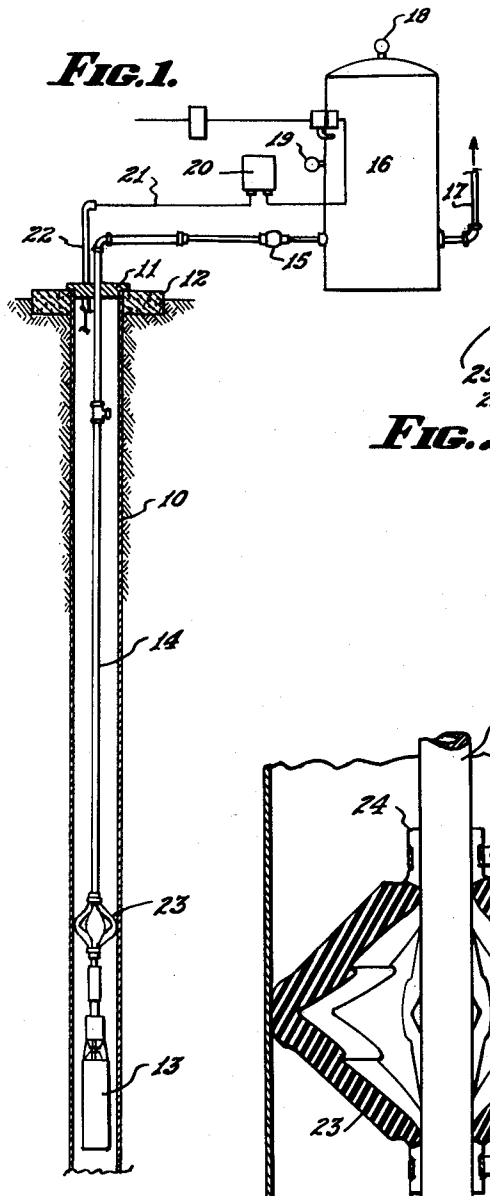

FIG. 1.

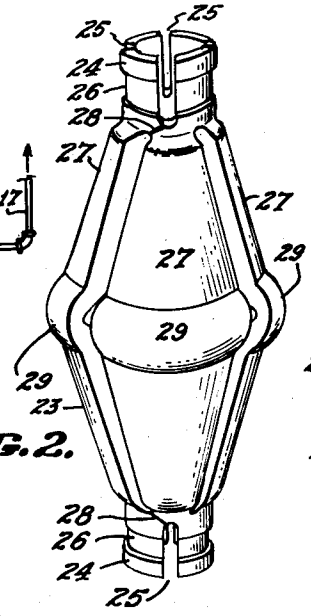

FIG. 2.

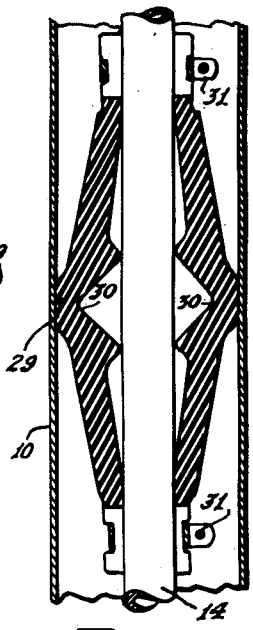

FIG. 3.

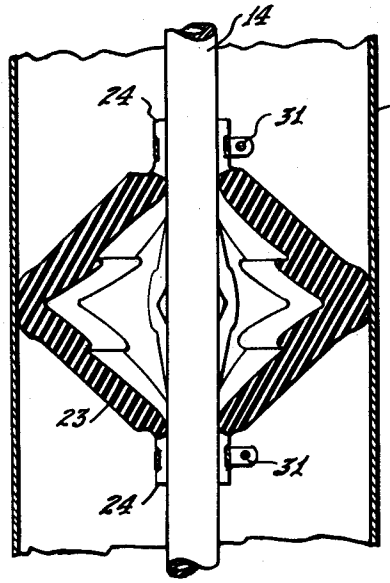

FIG. 4.

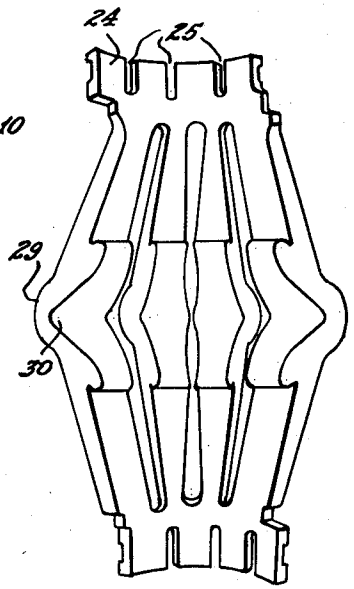

FIG. 5.

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CENTRALIZING SPIDER FOR WELLS

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1 Claim. (Cl. 166—241)

This invention relates to a centralizing spider for wells wherein a discharge pipe passes upward from the bottom of the well within a casing. In order to keep the discharge pipe centered within the well casing and to cut down noise and vibrations and also to protect the pumping unit if a submersible pumping unit is used, it has been customary to provide a centralizing spider generally in the form of a hub which tightly embraced the pipe and having a plurality of laterally extending spokes or vanes of such length as to contact the inside of the well casing.

One of the difficulties has been that different diameters of discharge pipe are used and the various discharge pipe diameters will be used in casings of different diameters. It has, therefore, been necessary to provide these centralizing spiders in a variety of sizes as to inside diameter of the hub and as to length of the spokes or vanes.

It is an object of the present invention therefore to provide a universal centralizing spider which will be capable of fitting a variety of discharge pipe sizes and a variety of well casings. It is another object of the invention to provide a device of the character described which is of unitary construction and which is relatively inexpensive to manufacture and simple in application.

These and other objects of the invention which will be described in more detail hereinafter, or which will be apparent to one skilled in the art upon reading these specifications, I accomplish by that certain construction and arrangement of parts of which I shall now describe an exemplary embodiment.

Reference is made to the drawings forming a part hereof and in which:

Figure 1 is a diagrammatic representation more or less of a water system for a residence showing the well hole in cross-section.

Figure 2 is a perspective view of the spider according to my invention.

Figure 3 is a fragmentary cross-sectional view through a piece of well casing of small diameter showing the device in use.

Figure 4 is a view similar to Figure 3 but showing the device in use in a large diameter well casing.

Figure 5 is a perspective view of the device in opened up condition.

Briefly, in the practice of the invention I provide a member molded of rubber or rubber-like material and having at each end a collar element adapted to be clamped about a discharge pipe and extending between the collar members there are a plurality of spaced limbs. The limbs, substantially midway between the collar elements, have an interior notch and an exteriorally convex bead to provide a preferential point of outward flexure midway of their length. The collars are preferably split so that the device may be opened up and placed around a discharge pipe. Post clamps may then be applied to the collars to clamp the device to the discharge pipe. In order that

the central portions of the limbs contact the interior of the well casing, the spacing between the collar members is adjusted to cause the connecting limbs to flex intermediate their ends until they contact the well casing.

Referring now in more detail to the drawings, Figure 1 shows a well having a casing **10** secured with a cap member **11** to a top slab **12** at the surface of the ground. A submersible motor pump unit is indicated generally at **13** at the bottom of the well. The pump discharges water from the well through the discharge pipe **14** through a check valve **15** into a tank **16** from which a service line **17** extends. The tank will generally have a pressure relief valve **18** and a pressure gauge **19**. Electric power from the control box **20** is supplied to the motor of the motor pump unit through the line **21** communicating with the water-proof conduit **22**. In Figure 1, the spider according to the invention is generally indicated at **23**.

Referring now to Figures 2 to 5 inclusive, the spider itself will be seen to have the upper and lower collar elements indicated generally at **24**, each of these being slotted as at **25** so as to facilitate clamping action. Each may also be provided with the annular groove or seat **26** with which a hose clamp may engage. A plurality of limbs **27** extend between the collar members **24** and it will be observed that the collar members are split at a point **28** so that the device may be opened up as shown in Figure 5. The lines of separation **28** communicate between opposite slots **25** of the collar members and between a pair of adjacent limbs **27**.

These limbs **27** are wider at their central portion than at their ends and are provided with an outwardly extending convex bead **29** and an interior notch **30**. The combination of the bead **29** and notch **30** provides a preferential line of flexure at the midpoint of each of the limbs **27**, so that if the device in the condition of Figure 2 is grasped with the hands and the two collars **24** are pushed toward each other, the limbs **27** will flex outwardly to the position shown in Figure 4.

In use, the device is opened up to the condition of Figure 5 and placed around a discharge pipe **14** as in Figures 3 and 4. Hose clamps **31** are then placed around the collar elements preferably seated in the grooves **26** and the collars are adjusted toward and away from each other so that the exterior beads **29** engage the interior of the casing **10**.

In Figure 3 the device is shown in use in a small diameter casing and it will be seen that the collar members **24** are separated to their maximum separation. In Figure 4, the device is shown in use in a large diameter casing and it will be seen that the collar elements **24** have been moved toward each other. In both Figures 3 and 4, the discharge pipe **14** is centered within the casing **10**.

The device may be made of a variety of materials and it is only important that the material be one which will be flexible and yet stiff and that it not be deleteriously affected by constant contact with water. In the claims therefore the term "rubber" is understood to include any rubber, natural or synthetic, and other rubber-like materials as above outline.

It will be clear that various modifications in detail may be made without departing from the spirit of the invention and I therefore do not intend to limit myself except as set forth in the claim which follows.

Having now fully described my invention, what I claim as new and desire to secure by Letters Patent is:

An adjustable centralizing spider for centering a pipe within a well casing, comprising a one-piece member of rubber having at each end a split collar element having an annular groove thereabout, and a clamp seated in said groove, whereby it is adapted to be clamped about said

pipe, and a plurality of spaced limbs extending between said collar elements, whereby the external diameter of said spider may be varied by varying the spacing between said collar elements when clamped about said pipe, each of said limbs, substantially midway between said collar elements, being provided with a notch facing toward the axis of the device and a convex bead on the side thereof facing outwardly from the axis of the device, to provide a preferential point of outward flexure midway of its length, whereby said device may contact the inside wall of said casing substantially midway between said collar elements and thereby center said pipe within said casing.

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