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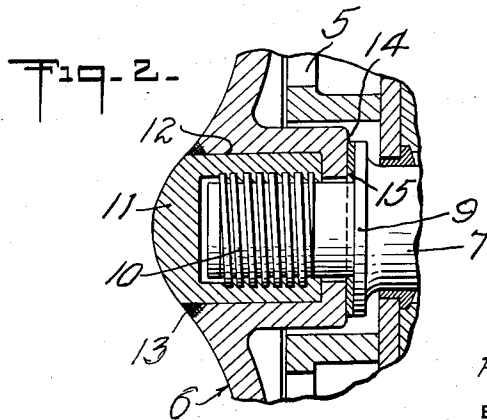
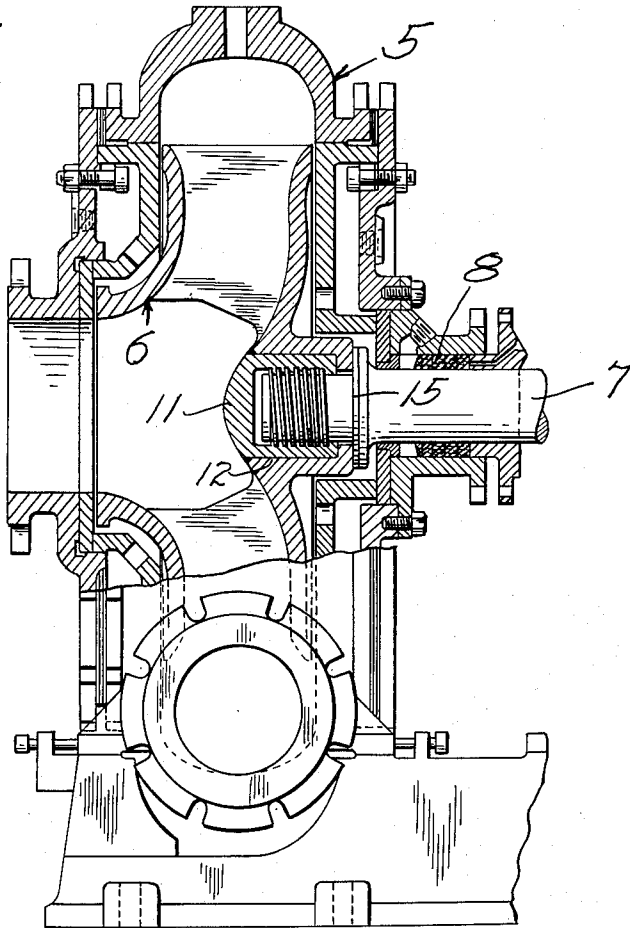
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PUMP

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Fig. 1-



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1 Claim. (Cl. 103—103)

My invention relates to a pump or the like.

In centrifugal pumps and like machines, the impeller is usually or very often threaded onto the drive shaft, which extends into the pump casing. The drive shaft usually has a substantial shoulder thereon, and the impeller is screwed on the shaft and abuts very securely against the shoulder on the shaft. Since both the impeller and the shaft are usually formed of ferrous metal, the impeller and shaft often corrode and tend to stick very tightly to each other so that it is virtually impossible to unscrew the impeller from the shaft when it becomes necessary to take the pump apart.

It is an object of the invention, therefore, to provide means for inhibiting the corrosion of a pump impeller or the like to a shaft.

It is another object to provide means for providing a joint between a pump impeller and a shaft, which may be readily broken, and which will not be subject to corrosion.

Briefly stated, in a preferred form of the invention as applied to a centrifugal pump, the drive shaft extends into the pump casing and the impeller is threaded or otherwise wedgingly secured to the drive shaft so as to be driven thereby during normal operation. The impeller or the like is usually threaded to the shaft, and the latter has a shoulder for cooperation with an abutment surface or shoulder on the impeller so as to limit the position of the impeller on the shaft. Instead of having the shoulder and the impeller in direct engagement where they might corrode so as to render removal of the impeller from the shaft impossible or very difficult, I interpose a washer between the shaft and the impeller so as to render it fairly easy to break the connection between the shaft and the impeller and remove the latter from the shaft when it becomes necessary to dismantle the pump for any reason.

In the preferred form, the washer or liner between the shaft and the impeller consists of a washer of stainless steel, which is hardened and ground to a smooth surface. Thus, when the impeller is tightly screwed onto a shaft, the impeller and shaft bind tightly on the stainless steel washer so that the pump operates normally. However, when it is necessary to remove the impeller from the shaft, reasonable force in the right direction will break the frictional hold between the impeller and the shaft, and due to the fact that the washer is stainless steel and separates the shaft and impeller, there is no chance of having the impeller or the shaft corrode into tight engagement with either the stainless steel washer or with each other.

In the drawings which show, for illustrative purposes only, a preferred form of the invention—

Fig. 1 is a view in side elevation of a centrifugal pump, parts being broken away on a central vertical plane and shown in section to illustrate interior construction;

Fig. 2 is an enlarged fragmentary sectional view, illustrating the invention as applied to a part of the pump of Fig. 1.

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The invention is not limited to a centrifugal pump since the principles of the invention are of broader application and may be employed in various connections, but a pump application is typical and is herein described.

5 The centrifugal pump comprises the usual casing 5, having a rotatable impeller 6 therein. The drive shaft 7 extends through a stuffing-box 8 and suitable bearing into the casing, where it is secured to the shaft. In the form illustrated, the shaft 7 has a substantial shoulder 9 formed thereon for abutment by a part of the impeller. The end of the shaft is threaded as indicated at 10. The impeller, or rather a part carried by the impeller, such as the plug nut 11, is internally threaded so as to engage the threads 10 for holding the impeller in place. In the form illustrated, the plug nut 11 fits in a bore or recess 12 in the impeller and may be secured to the impeller as by welding, as shown at 13. The bottom of the plug nut 11 fits the shoulder at the bottom of the recess 12 so that, in effect, the plug nut becomes an integral part of the impeller. A part of the impeller has an abutment face or surface 14, complementary to the corresponding surface on the shoulder 9 of the shaft 7.

Normally, the impeller would abut directly against the shoulder 9, and due to the fact that both the impeller and the shaft are usually formed of ferrous metal, they would be likely to corrode or rust to such an extent as to bind the two together so as to make it next to impossible to break the impeller loose from the shaft when it is desired to dismantle the pump for any reason.

My invention relates particularly to means for preventing such corrosion and permitting easy removal of the impeller from the shaft when desired. Between the impeller surface 14 and the corresponding abutment face on the shoulder 9, I interpose a washer 15 of stainless steel, which is hardened and ground to a smooth finish, and which fits both of the surfaces 14 and 9 with good flat fits. Thus, when the shaft is screwed up tightly onto the impeller, both the shaft and the impeller bind tightly on the stainless steel washer 15 and cause the impeller and shaft to rotate as a unit as desired.

Now, since the washer 15 is of stainless steel, there is no chance of corrosion between the impeller or the shaft and the washer, or between the impeller and shaft themselves. Thus, the joint will be at all times very secure yet frictional, and when it is desired to remove the shaft from the impeller, it will be only necessary to exert a reasonable force so as to break the frictional contact between the washer 15 and the respective shaft and impeller surfaces. As has been heretofore stated, under normal conditions without the washers 15, impellers and shafts often become so corroded that it is well nigh impossible to unscrew the shafts from the impellers, and shafts or impellers may be broken or seriously marred.

55 While the invention has been described in considerable detail and a preferred form illustrated, it is to be understood that various changes may be made within the scope of the invention as defined in the appended claim.

I claim:

60 A pump comprising a casing, an impeller made of ferrous metal in said casing, a drive shaft made of ferrous metal extending into said casing, said shaft being threaded and said impeller having a threaded connection with said shaft, said shaft having an abutment shoulder and said impeller having a cooperating abutment surface, a washer interposed between said shoulder and abutment surface, said washer being formed of stainless steel which is hardened and ground to a smooth finish to prevent rusting of said impeller or shaft to said washer or to each other.

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