

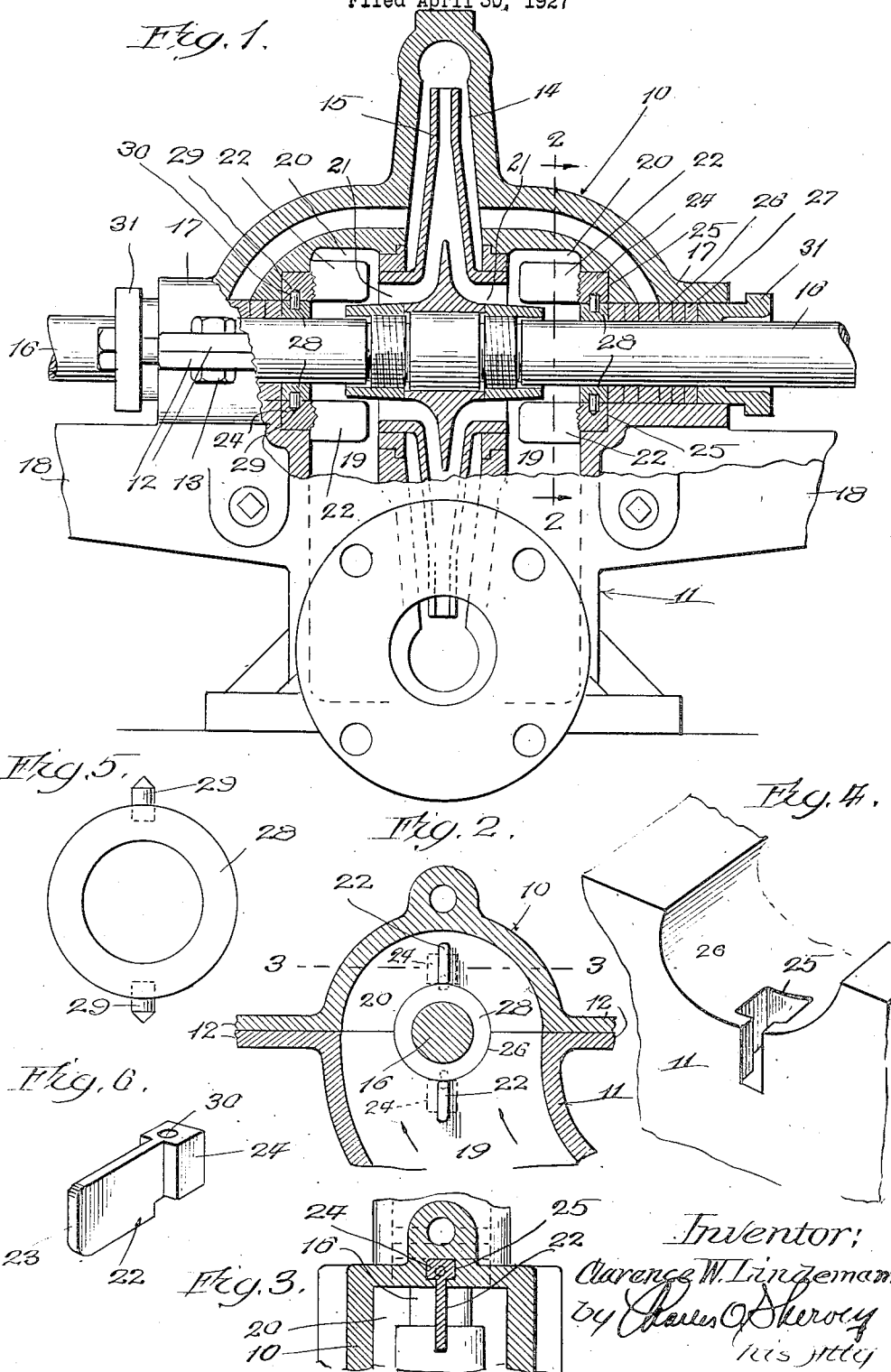
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CENTRIFUGAL PUMP

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CENTRIFUGAL PUMP.

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This invention relates to centrifugal pumps and more particularly to the baffles, which are usually employed at the inlet of the impeller. As is well understood one or more baffles are employed in the fluid supply passage or suction chamber of the pump at the place where said passage leads to the inlet of the impeller, the purpose of baffles being to reduce the whirling movement of the fluid while passing from the suction chamber to the inlet of the impeller. The principal object of the present invention is to provide improved means for connecting the baffle or baffles with the pump casing. Another object is to provide a baffle which may be readily attached to or removed from the pump casing. Another object is to provide attaching means between the baffle and casing which will not interfere with the ordinary machining of the casing. With these and other objects and advantages in view this invention consists in a centrifugal pump having one or more baffles removably secured to one of its case walls. The invention further consists in a centrifugal pump having a wall formed with an undercut recess in which is removably secured the base portion of a baffle. It further consists in a centrifugal pump provided with a plurality of readily removable baffles having interlocking connections with a packing retaining ring whereby said ring may be held against endwise pressure. The invention further consists in the several novel features hereinafter fully set forth and claimed.

The invention is clearly illustrated in the drawing accompanying this specification, in which:

Fig. 1 is a view partly in side elevation and partly in central, vertical, longitudinal section of a centrifugal pump embodying a simple form of the present invention; Fig. 2 is a detail vertical cross section taken on the line 2—2 of Fig. 1; Fig. 3 is a detail horizontal section taken on the line 3—3 of Fig. 2; Fig. 4 is a fragmental perspective view of the lower portion of the pump case; Fig. 5 is a side elevation of a packing retaining ring and Fig. 6 is a perspective view of one of the baffles forming the subject matter of this specification.

Referring to said drawing, which illustrates a simple embodiment of the present invention, the reference character 10 designates the upper section of a pump case of

conventional form and 11 designates the lower section thereof. The upper and lower sections are provided with lateral flanges 12 bolted together by bolts 13 as is usual. The pump case is formed with a chamber 14 in which is contained an impeller 15 of the ordinary type and said impeller is mounted upon an impeller shaft 16, which extends out through packing boxes 17 formed on the case. The ends of said impeller shaft are journaled in suitable bearings (not shown) usually provided on the ends of bracket arms 18 that are formed on or secured to the lower case section 11. In the type of centrifugal pump shown there are two fluid supply passages 19, one on each side of the impeller chamber 14, which fluid passages constitute suction chambers that terminate in annular spaces 20 surrounding the impeller shaft and lead into the inlets 21 of the impeller. Each inlet extends in a plane transverse to the axis of rotation of the impeller. It has been found that without the use of baffles, a whirling movement is imparted to the fluid in passing from the suction chamber to the inlet of the impeller and to minimize this whirling movement, one or more baffles 22 are provided in the suction chamber which baffles extend parallel with the axis of rotation of the impeller and resist the whirling action of the fluid or the formation of eddy currents therein near the impeller inlets.

In the present form I have illustrated two baffles for each inlet of the impeller, one baffle being provided above and one below the impeller shaft. Each baffle is formed with a blade or wing 23 and with a base 24 of any suitable form but somewhat thicker than the thickness of the blade or wing 23. The pump sections are formed with undercut recesses 25 of the same size and shape as the bases 24 of the baffles and receive said bases of the baffles and hold the baffles in place in the suction chamber. The undercut recesses 25 extend radially from the bore 26 of each packing box 17 whereby when the two sections of the pump shaft are disconnected and taken apart the bases of the baffles may be inserted in the recesses 25 or removed therefrom. Within the packing boxes 17 is packing 27, and a packing retaining ring 28 is provided at the inner end of each packing box which packing ring has an interlocking connection with each of the associated baffles

22. As shown the packing retaining ring 28 is provided with radially extending pins 29 that enter sockets or holes 30 formed in the bases 24 of the baffles. It will be evident
 5 that with the bases of the baffles seated in the undercut recesses 25 and with the pins 29 of the packing retaining rings seated in the holes 30 of the baffle bases, endwise movement of the packing retaining ring will
 10 be effectively prevented. The usual gland 31 and take up devices are provided at the outer end of each packing box for supplying the necessary pressure on the packing.

In assembling the parts the baffles are inserted into the undercut recesses 25 while the two sections 10, 11 of the pump case are disconnected from each other and the packing retaining rings, packing rings and glands are placed upon the impeller shaft
 20 and with the impeller fast on the shaft, said parts are placed in the lower section of the casing and the upper section thereafter placed on the lower section and bolted thereto. The ends of the shaft are contained in the bearing at the outer end of the
 25 bracket arms 18 as has been explained.

It will be observed that the usual machining of the parts of the casing requiring machining is not in any manner interfered
 30 with by the baffles or parts that hold them in place. Furthermore, the baffles serve to hold the packing retaining rings in place against endwise movement on the shaft. The blades or wings of the baffles minimize
 35 the tendency for the fluid to whirl or form eddies while passing from the suction chamber to the inlet of the impeller. While the invention has been shown in connection with a centrifugal pump having two fluid inlet
 40 passages or suction chambers, it is to be observed that the baffles may be provided for a single inlet centrifugal pump and that one or a plurality of baffles embodying the construction described may be employed at
 45 each inlet side of the impeller.

More or less variation of the exact details of construction is possible without departing from the spirit of this invention; I desire, therefore, not to limit myself to the
 50 exact form of the construction shown and described, but intend, in the following claims, to point out all of the invention disclosed herein.

I claim as new and desire to secure by
 55 Letters Patent:

1. In a centrifugal pump, the combination with a pump case comprising two secured together sections and formed with an impeller chamber, a suction chamber and a bore
 60 for the reception of a shaft, an impeller shaft in said bore and an impeller on said shaft within said impeller chamber and having an annular inlet in a plane transverse to the plane of rotation, and into which inlet said
 65 suction chamber leads, of a baffle located in

said suction chamber and having an enlarged base portion located entirely at one side of the shaft and removably secured in an undercut recess formed in a wall of the pump case, said baffle acting to reduce whirling
 70 of fluid passing from the suction chamber to the inlet of the impeller.

2. In a centrifugal pump, the combination with a pump case comprising secured together top and bottom sections, and formed
 75 with an impeller chamber, a suction chamber, a bore for a shaft and an undercut recess leading from said bore, an impeller shaft in said bore and an impeller on said shaft within said impeller chamber and having
 80 an annular inlet in a plane transverse to the plane of rotation, and into which inlet said suction chamber leads, of a baffle located in said suction chamber and having an enlarged base portion located entirely at
 85 one side of the shaft and secured in said undercut recess and removable through said bore, said baffle acting to reduce whirling of fluid passing from the suction chamber to the inlet of the impeller.
 90

3. In a centrifugal pump, the combination with a pump case comprising secured together top and bottom sections, and formed with an impeller chamber, a suction chamber,
 95 a bore for a shaft and an undercut recess leading from said bore, a packing and a packing retaining ring in said bore, an impeller shaft in said bore and an impeller on said shaft within said impeller chamber and having an annular inlet in a plane transverse
 100 to the plane of rotation, and into which inlet said suction chamber leads, of a baffle located in said suction chamber and having an enlarged base portion secured in said undercut recess and removable through said
 105 bore, said baffle having an interlocking connection with said packing retaining ring for holding said ring against endwise movement and acting to reduce whirling of fluid passing from the suction chamber to the
 110 inlet of the impeller.

4. In a centrifugal pump, the combination with a pump case comprising secured together top and bottom sections, and formed with an impeller chamber, a suction chamber,
 115 a bore for a shaft and an undercut recess leading from said bore, a packing and a packing retaining ring in said bore, an impeller shaft in said bore and an impeller on said shaft within said impeller chamber and having an annular inlet in a plane transverse to the plane of rotation, and into which inlet said suction chamber leads, of a baffle located in said suction chamber and having an enlarged base portion
 120 secured in said undercut recess and removable through said bore, said packing retaining ring having pins engaging in holes in the base of the baffle whereby said ring is held against endwise movement, and said
 130

baffle acting to reduce whirling of fluid passing from the suction chamber to the inlet of the impeller.

5 5. In a centrifugal pump, the combination with a pump case comprising secured together sections and formed with an impeller chamber, a suction chamber and a bore for the reception of a shaft, an impeller shaft in said bore and an impeller on said shaft
10 within said impeller chamber and having an annular inlet in a plane transverse to the plane of rotation, and into which inlet said

suction chamber leads, of baffle plates contained in said suction chamber, one at each side of said impeller shaft, each baffle having
15 an enlarged base portion located entirely at one side of the shaft and removably secured in an undercut recess formed in the wall of the pump case, and said baffles acting to reduce whirling of fluid passing from the
20 suction chamber to the inlet of the impeller.

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