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A. J. STEPANOFF

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ADJUSTING AND HOLDING DEVICE

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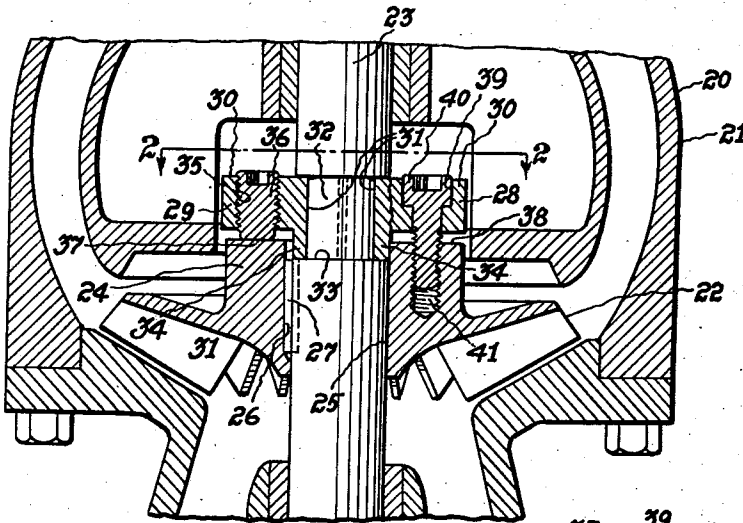


FIG-1.

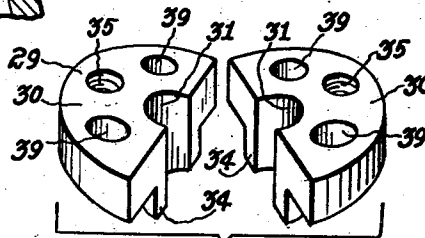


FIG-3.

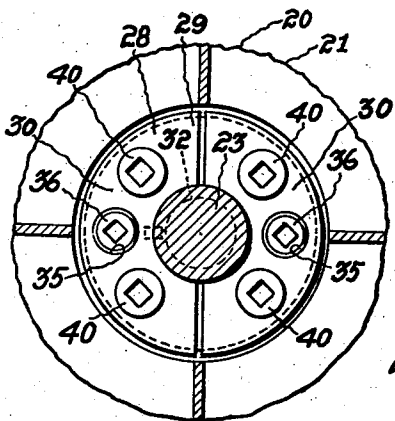


FIG-2.

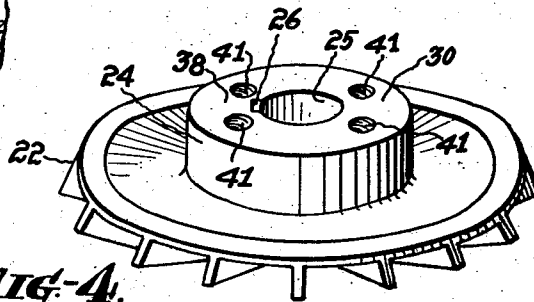


FIG-4.

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UNITED STATES PATENT OFFICE

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ADJUSTING AND HOLDING DEVICE

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4 Claims. (Cl. 287—52)

1

This invention relates to centrifugal machines, as for example pumps, blowers, or the like, and more particularly to a device for adjusting and holding an impeller on a shaft.

One object of the invention is to facilitate the operation of placing an impeller in the correct assembled position on a shaft.

A further object is to enable an impeller to be conveniently and expeditiously adjusted axially of the shaft in order to assure the correct positioning of the impeller within the chamber containing it.

Other objects will be in part obvious and in part pointed out hereinafter.

In the drawings accompanying this specification and in which similar reference numerals refer to similar parts,

Figure 1 is an elevation of a portion of a centrifugal pump of the vertical type having the invention applied thereto,

Figure 2 is a transverse view taken through Figure 1 on the line 2—2 looking in the direction indicated by the arrows, and

Figures 3 and 4 are perspective views of details of the invention.

Referring more particularly to the drawings, 20 designates a portion of a centrifugal pump comprising a casing 21, an impeller 22 therein, and a shaft 23 for the impeller.

The impeller 22 is of the open type and in its hub 24 is a bore 25 having a nice sliding fit on the shaft 23, and in the bore is a slot 26 for sliding engagement with a key 27 seated in the shaft 23.

The impeller, as will be readily understood, is thus restrained against rotary movement with respect to the shaft but is capable of movement endwise thereof. Such movement is imparted to the impeller by the adjusting and holding device designated in its entirety by 28 and which, constructed according to the invention, comprises a holder 29 in the form of a circular plate that overlies the end of the hub 24 and is split longitudinally to divide it into two symmetrical members 30.

The diameter of the holder may, as illustrated, approximate that of the hub 24, and in the opposed surfaces of the members 30 are recesses 31 to accommodate a reduced portion 32, of the shaft, defined by an annular groove 33. The end surfaces of the members 30 seat against the adjacent ends of the groove 33, and on the side of the members 30 confronting the impeller 22 are partly circular extensions 34 that extend part way into the hub 24 and are engaged thereby for re-

2

taining the said members 30 in the annular groove 33.

The portion of the holder 29 overlying the hub 24 is spaced therefrom a suitable distance to permit of movement of the impeller toward the holder, if required to place the impeller in the correct assembled position. In diametrically opposed portions of the holder are threaded apertures 35, there being one in each of the members 30, for the accommodation of screws 36 that are adjustable endwise of the shaft 23 and have flatted end surfaces 37 to serve as abutments for the adjacent end surface 38 of the hub 24. Each member 30 also has a pair of holes 39 to receive screws 40 that are threaded into sockets 41 in the hub 24 and serve to draw the hub firmly against the end surfaces 37 of the screws 35.

In practice, whenever it is intended to assemble the holder and the impeller on the shaft, the members 30 are first placed in the annular groove 33 and the impeller is then positioned in such wise that the end of the hub will encircle at least the free-end portions of the extensions 34. Thereafter, the screws 36 and 40 are manipulated to respectively determine the position for the impeller on the shaft and to hold the impeller against the ends of the screws 36.

These adjustments will, of course, be made with a view toward placing the impeller in the correct position within the impeller chamber to establish the degree of clearance required between the open side of the impeller and the adjacent wall of the casing for the attainment of maximum efficiency of the pump.

I claim:

1. In a holding and adjusting device, a shaft, an impeller on the shaft, a holder on the shaft, means carried by the holder for effecting adjustment of the impeller axially of the shaft, and means on the holder cooperating with the impeller for retaining the holder on the shaft during all adjusted positions of the impeller.

2. In a holding and adjusting device, a shaft, an impeller on the shaft, a holder interlockingly connected with the shaft to prevent relative endwise movement and comprising a plurality of members, means on the members in telescopic engagement with the impeller to retain the members in the correct assembled relationship with each other, and means carried by the holder for adjusting the impeller axially of the shaft to a desired position and to hold the impeller firmly in such position.

3. In a holding and adjusting device, a shaft having an external annular groove, an impeller

3

on the shaft, a holder seated in the annular groove comprising a plurality of members, means on the members extending into the impeller for retaining the members in the groove, and means carried by the holder for adjusting the impeller axially of the shaft to a desired position and to hold the impeller firmly in such position.

4. In a holding and adjusting device, a shaft, an impeller on the shaft, a holder interlockingly connected with the shaft to prevent relative endwise movement and comprising a plurality of members, means on the members to cooperate with the impeller for retaining the members on the shaft and in the correct assembled relationship with each other, screws in the holder extending longitudinally of the shaft to serve as adjust-

4

able abutments for the impeller, and other screws in the holder in threaded engagement with the impeller for drawing the impeller firmly against the abutments.

ALEXEY J. STEPANOFF.

REFERENCES CITED

The following references are of record in the file of this patent:

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