May 22, 1928. 1,670,877

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DRIVING MECHANISM

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Fig. 1.

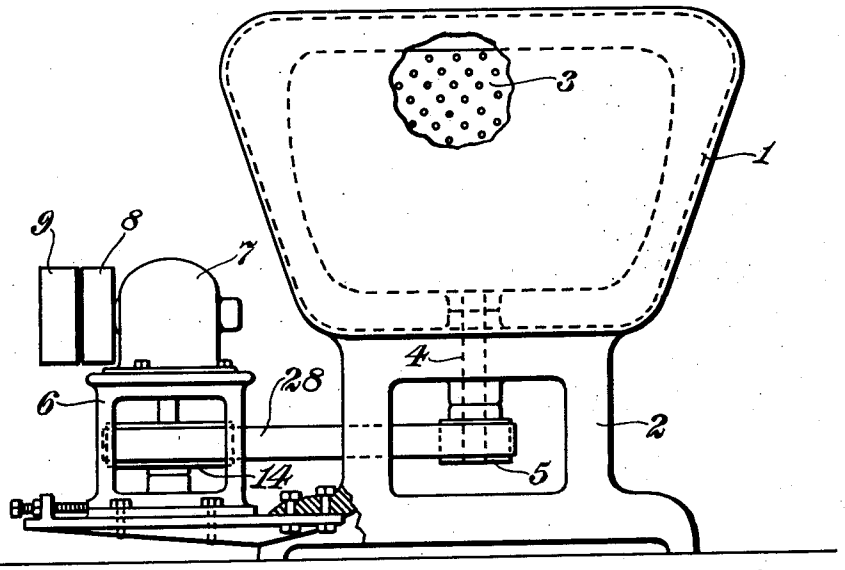


Fig. 2.

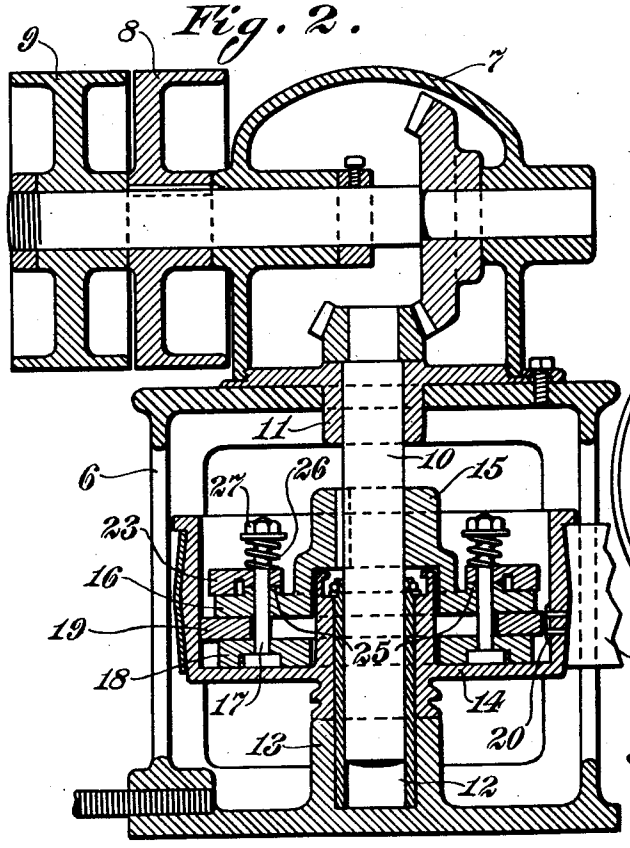
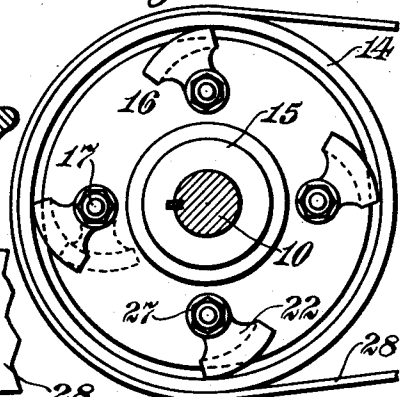


Fig. 4.

Fig. 3.



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DRIVING MECHANISM.

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This invention pertains to centrifugal apparatus such as is used in laundries for drying clothes and more particularly to mechanism for driving such apparatus.

As is well known this type of drying apparatus, usually spoken of as a centrifugal, comprises a perforated bowl mounted to rotate at high speed on a vertical spindle. Such a bowl when loaded with clothes is usually quite heavy and must be started and brought up to speed gradually. The bringing up to speed of such a centrifugal from a constant speed driving source is usually a difficult operation unless special apparatus is provided therefor.

One of the objects of this invention, therefore, is to provide mechanism for driving such a centrifugal and bringing it up to speed in such a manner as not to put unnecessary strains upon the driving connections.

Another object is to provide such driving mechanism which will apply a starting effort which is small at starting but which increases in accordance with the speed of the driving element.

Another object is to provide such driving mechanism in which the starting effort will be applied in a yielding manner so that the start will be gradual and smooth.

Further objects will appear from the following description taken in connection with the accompanying drawing in which:

Figure 1 represents a view in elevation of a laundry centrifugal provided with driving mechanism embodying this invention;

Figure 2 is a vertical section of the driving mechanism;

Figure 3 is a plan view of the pulley containing the clutch; and

Figure 4 is a detail perspective view of one of the governor weights.

Referring to the accompanying drawing 1 designates the casing of the laundry centrifugal supported on a base 2 and enclosing a perforated clothes drum 3 mounted on a vertical spindle 4 running in suitable bearings in the base 2 and equipped with a pulley 5 at its lower end. Mounted adjacent the base 2 is a support 6 which carries a driving head 7 of any suitable type having fast and loose pulleys 8 and 9 respectively which may be belted to any suitable source of driving power not shown.

The head 7 and its contained mechanism operates a vertical driving shaft 10 having suitable bearings 11 and 12 in the support 6. The bearing 12 is in the form of a sleeve mounted in a boss 13 on the support 6 and serves as a bearing not only for the shaft 10 which runs within it but for a hollow pulley 14 which runs on the outside of it.

Keyed to the shaft 10 is a hub 15 which carries a friction disc 16 within the rim of the pulley 14. The disc 16 has connected thereto by a series of studs 17, a second friction disc 18. Mounted between the discs 16 and 18 is a third disc 19 which is splined at 20 to the rim of the pulley 14 and which has a central opening large enough to permit the studs 17 to rotate therewithin. Mounted on each of the studs 17 is a governor weight comprising a hub 21, a short arm 22 and a weight portion 23. Formed on the hub 21 are cam faces 24 adapted to engage complementary cam faces on lugs 25 on the disc 16. Each governor weight is held in place by a spring 26 surrounding the stud 17 and held in place by a nut 27 by which the tension of the spring may be adjusted.

In the operation of this device the springs 26 are adjusted so that when the shaft 10 is stationary a light pressure will be exerted by these springs tending to force the discs 16 and 18 together against the disc 19. When the shaft is stationary the governor weights are in the position indicated in dotted lines in Figure 3 or in a position substantially at right angles to the radius through its pivot. The weights are held in this position by the action of the cams 25 under the pressure of the springs 26. The pulley 14 is connected with the pulley 5 by a belt 28. The shaft 10 is started and brought up to full speed immediately. On account of the light pressure of the springs 26 the discs 16 and 18 will slip on the disc 19 thereby permitting the pulley 14 to turn at a slow speed and start the drum 3 slowly. As the pulley 14 gathers speed the governor weights tends to turn outwardly to the positions shown in solid lines in Figure 3. In carrying out such rotation of the weights the cam faces 24, cooperating with the lugs 25, will force the discs 16 and 18 together so as to clamp the disc 19 therebetween. The governor weights are, however, working against yielding abutments provided by the springs 26. Consequently a yielding effort will be applied to the clutch formed by the discs 16, 18 and 19. Consequently the clutch will slip but, as the speed of the driving element

increases the yielding pressure exerted by the governor weights will increase in accordance therewith. This will result in an increasing yielding pressure applied to the clutch which will have the effect of increasing its gripping tendency in accordance with the increasing speed. This increase, however, is limited. As the weights turn outwardly on their pivots their distances from the center of rotation increases, so that their centrifugal force increases accordingly. This force is transmitted to the disc clutch as a torque or turning moment acting about the pivot of each governor weight. While the centrifugal force increases as the weight turns about its pivot, the leverage of said force relatively to said pivot decreases. This is due to the fact that the direction of the force is always radial with respect to the center of rotation, and its line of action approaches the pivot as the weight turns, thus shortening the lever arm. A point will be reached, therefore, where the decrease in leverage fully compensates for the increase in force, and the torque reaches a limit. Consequently, the pressure on the discs is limited to a certain maximum regardless of the speed of the driving element. Accordingly, the clutch will not "grab" as the speed of the driving element increases, but will bring the driven element up to speed gradually and gently.

It will be seen, therefore, that this invention provides means for gradually bringing up to speed such a heavy mechanism with an effort which increases gradually but is limited regardless of the increase in speed of the driving element. The driving effort is applied yieldingly so that a gentle and uniform increase of velocity is obtained.

It is obvious that various changes may be made in the details of construction without departing from the spirit of this invention; it is to be understood, therefore, that this invention is not to be limited to the specific details shown and described.

Having thus described the invention what is claimed is:

1. In an apparatus of the character described, a driving element, a driven element including a pulley, a clutch within said pulley, and a series of centrifugal governor weights yielding abutments engaged by said weights, said weights having cam faces engaging said clutch, adapted to apply to said clutch a yielding engaging effort which varies in accordance with the speed of said driving element.

2. In a driving mechanism, a driving member, a friction disk connected with said member, a driven member, a second friction disk carried by said driven member, and provided with opposed friction faces one of which engages the first mentioned friction disk, a third friction disk engaging the other friction face of the second friction disk, studs connecting the third friction disk and the first mentioned friction disk and extending through the latter, weights each pivotally mounted on one of said studs and subject to centrifugal force generated by said driving member, said weights and first mentioned friction disk being provided with interacting cam faces, and resiliently yieldable means interacting between said studs and weights, whereby the frictional engagement between said disks will be governed according to the speed of said driving member.

In testimony whereof I affix my signature this 15th day of July, 1925.

PETER C. BRUCKMANN.