March 27, 1945. R. F. HLAVATY 2,372,378

SELF-ALIGNING PULLEY

Filed Jan. 8, 1944 4 Sheets-Sheet 1

Fig. 1

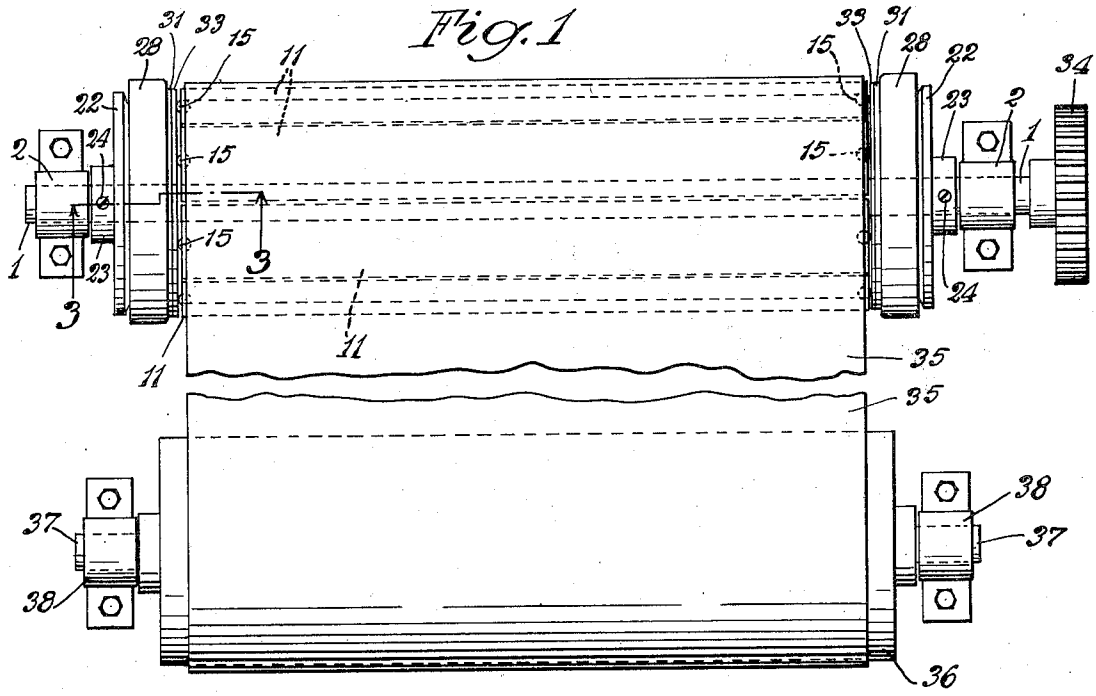
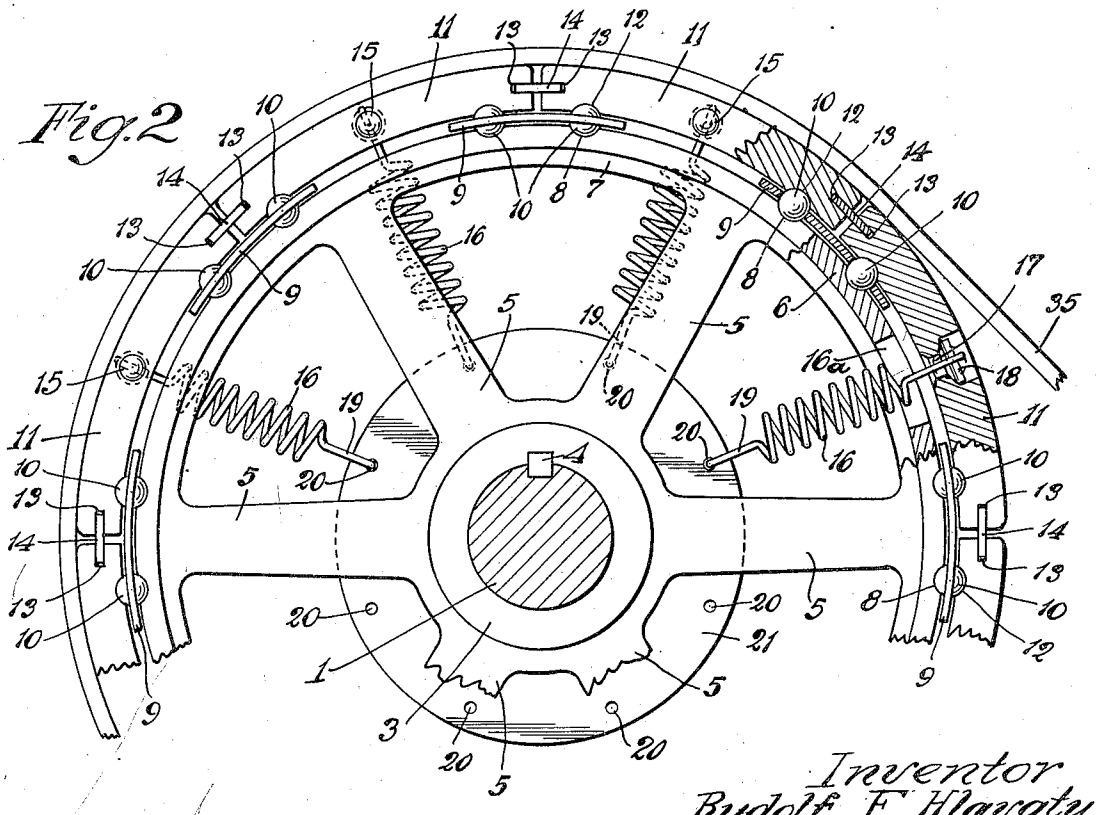


Fig. 2



Inventor
Rudolf F. Hlavaty
by Parker & Carter.
Attorneys.

March 27, 1945. R. F. HLAVATY 2,372,378

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Filed Jan. 8, 1944 4 Sheets-Sheet 2

Fig. 3

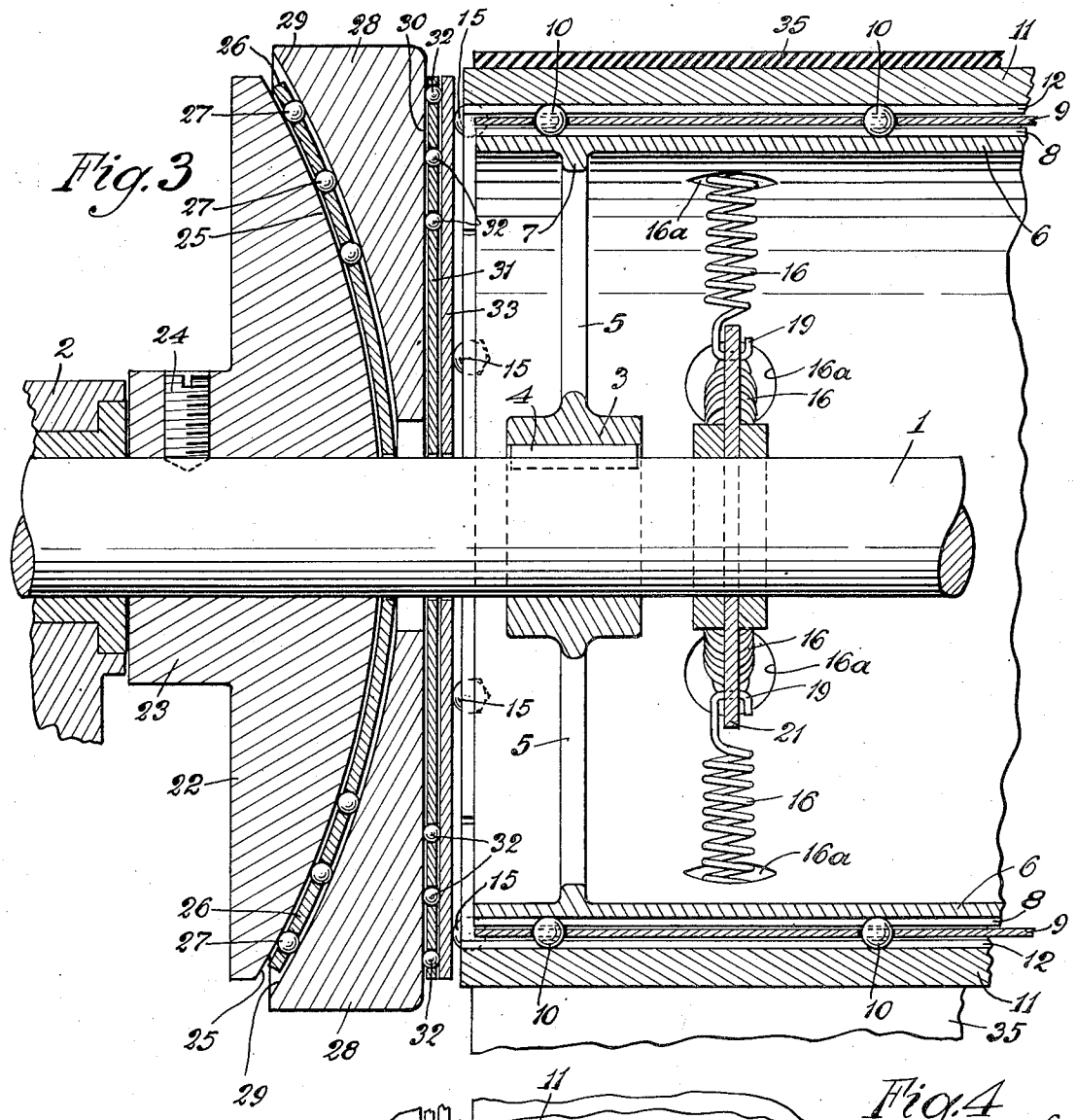
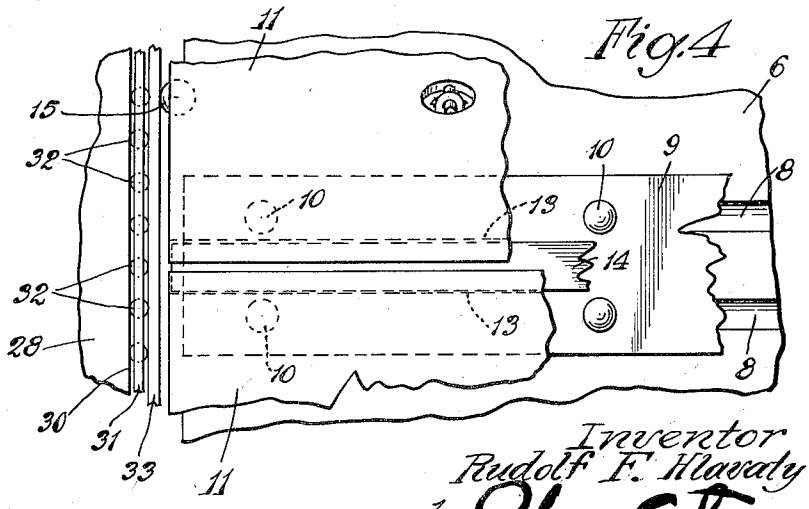


Fig. 4



Inventor
Rudolf F. Hlavaty
by Parker & Carter
Attorneys.

March 27, 1945. R. F. HLAVATY 2,372,378

SELF-ALIGNING PULLEY

Filed Jan. 8, 1944 4 Sheets-Sheet 3

Fig. 5

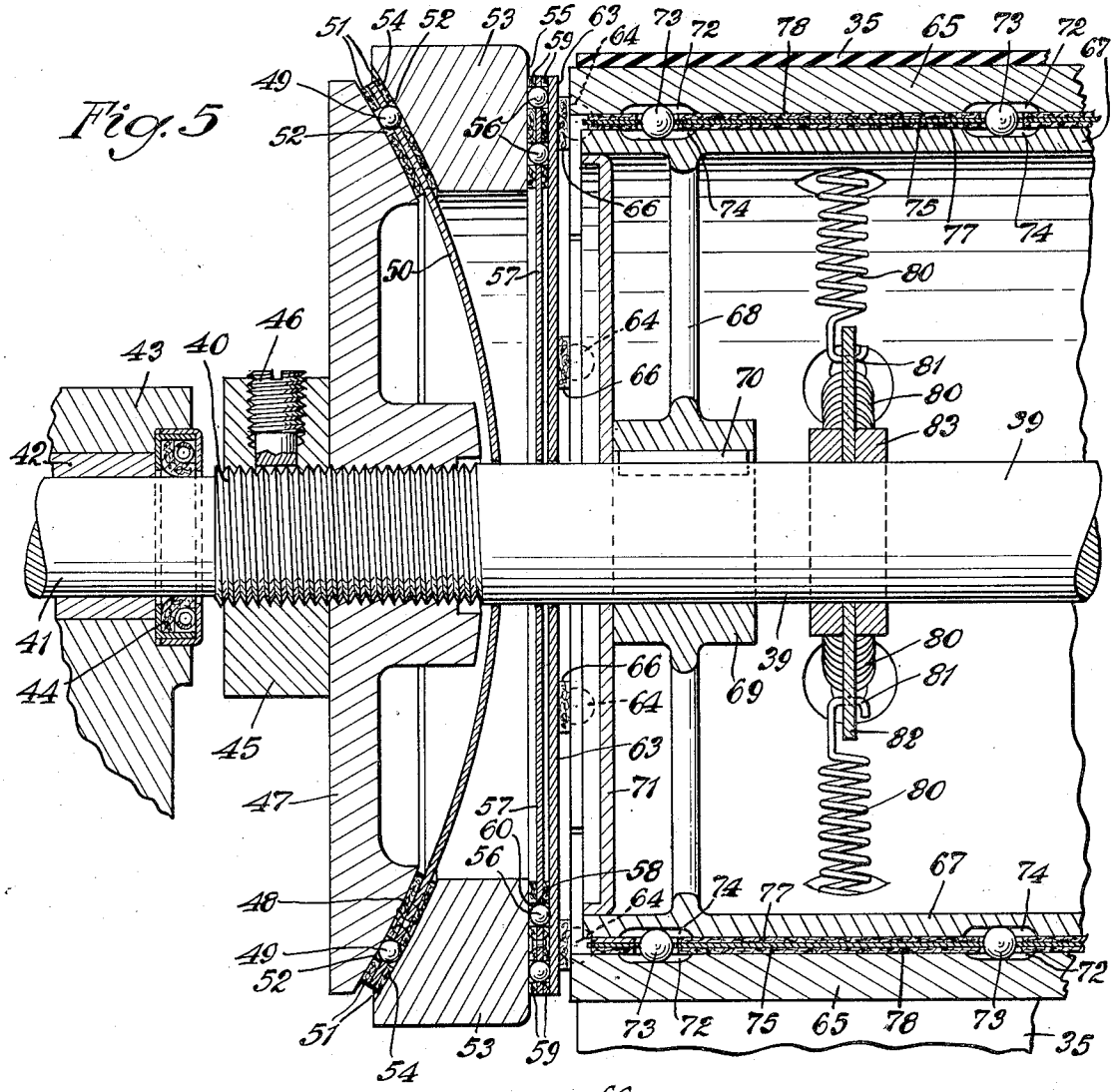


Fig. 12

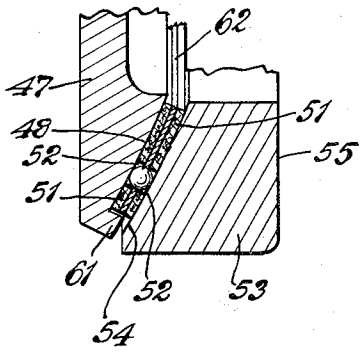
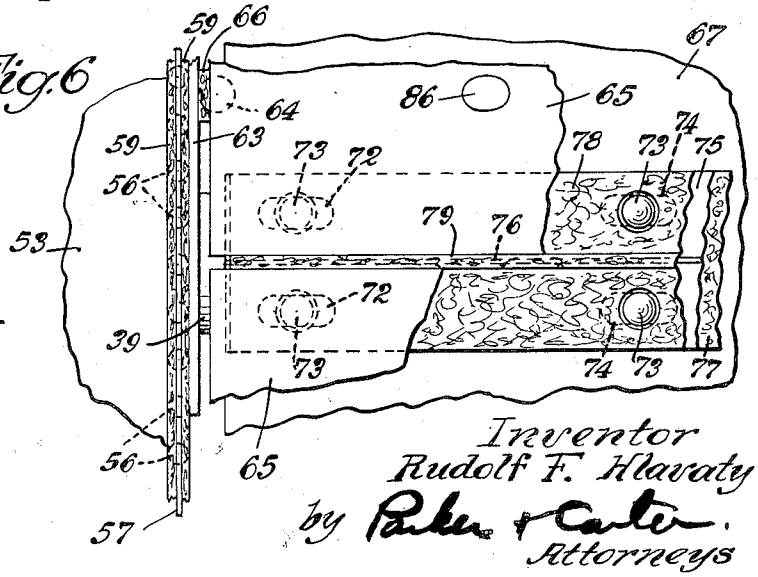


Fig. 6



Inventor
Rudolf F. Hlavaty
by Parker & Carter.
Attorneys

March 27, 1945. R. F. HLAVATY 2,372,378

SELF-ALIGNING PULLEY

Filed Jan. 8, 1944 4 Sheets-Sheet 4

Fig. 7

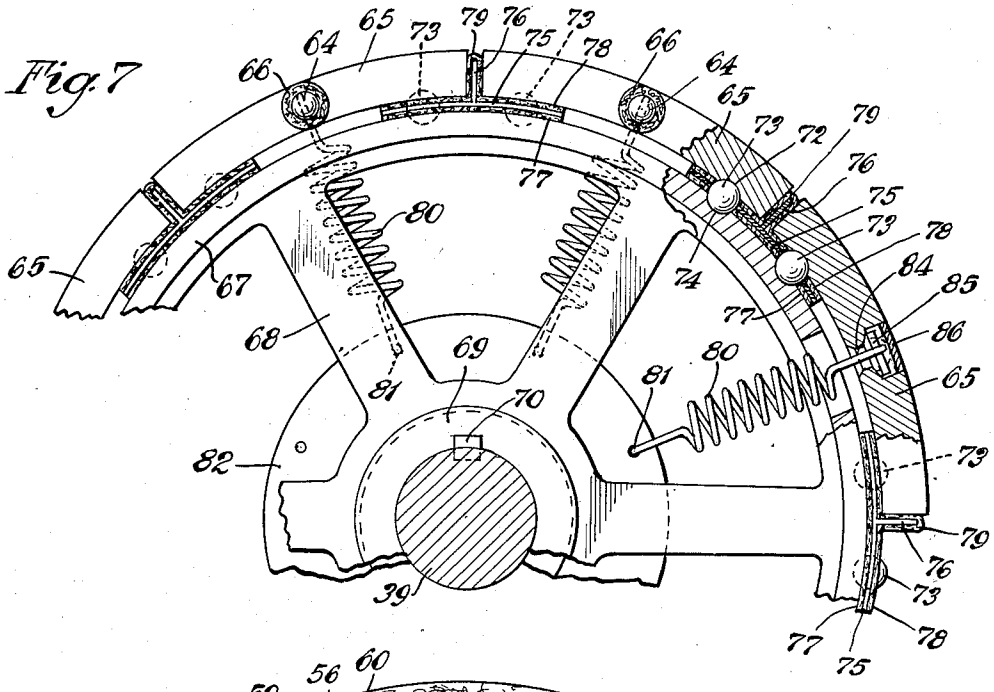


Fig. 8

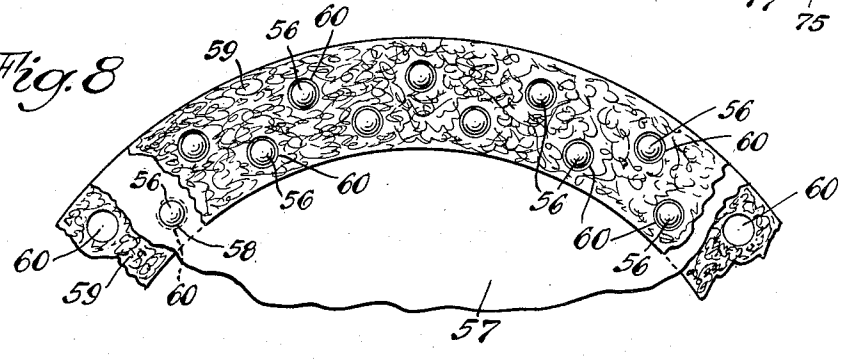


Fig. 9

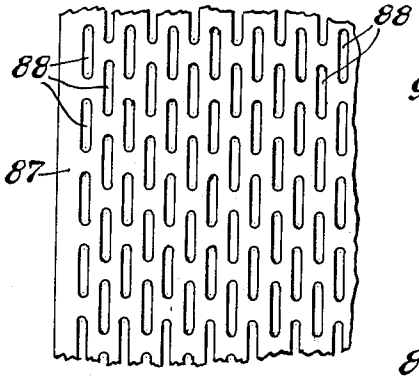


Fig. 10

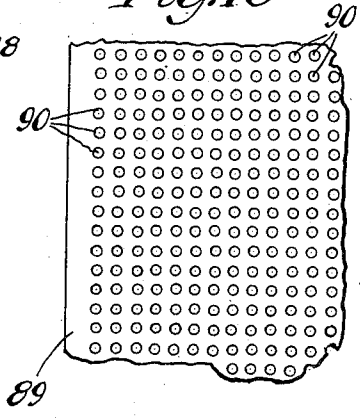
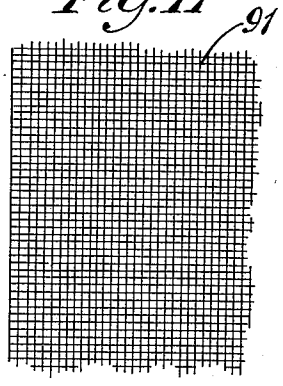


Fig. 11



Inventor
Rudolf F. Hlavaty
by Parker & Carter.
Attorneys.

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2,372,378

UNITED STATES PATENT OFFICE

2,372,378

SELF-ALIGNING PULLEY

Rudolf F. Hlavaty, Westchester, Ill.

Application January 8, 1944, Serial No. 517,495

18 Claims. (Cl. 74—241)

This invention relates to a self-aligning rotor, rocking or oscillating member, driven, idling or guiding. As shown herewith, it is a pulley. It has for one object to provide on such a member parts which operate automatically to keep it in alignment or to realign a member, such as a belt operating with the pulley. The belt may be of any construction, porous, perforated or open, and may serve as a carrier, a transmitter of power or a screen.

With standard pulleys belts have a tendency to move out of alignment. This tendency increases in the case of wide belts and may be increased by changes of temperature and atmospheric conditions. The structure of this invention has for one object to provide aligning and realigning means for a belt, screen separator or equivalent device under all conditions of operation, temperature and atmosphere and to obviate the necessity of manual adjusting means.

Another object is to provide realigning means operating in response to side movement of the belt or analogous member. In the particular form herewith illustrated, the structure is a pulley of large diameter, and the construction shown accomplishes realignment of a belt, screen or the like with respect to such a wide diameter pulley.

Other objects will appear from time to time throughout the specification and claims.

This invention is illustrated more or less diagrammatically in the accompanying drawings, wherein:

Figure 1 is a plan view showing the pulley of this invention in combination with a plain or standard pulley;

Figure 2 is an end elevation with parts in section and with parts broken away and parts omitted, showing the pulley of the present invention;

Figure 3 is a longitudinal vertical cross section taken on an enlarged scale at line 3—3 of Figure 1 with parts omitted;

Figure 4 is an enlarged fragmental plan view of a portion of the pulley shown on the scale which is used in Figure 3;

Figure 5 is a modification of Figure 3;

Figure 6 is a modification of the structure of Figure 4;

Figure 7 is an end elevation of the pulley of Figure 6, with parts broken away;

Figure 8 is a plan view of the sealing means of Figure 7;

Figures 9, 10 and 11 are plan views illustrating possible screen or belt forms; and

Figure 12 is a sectional detail illustrating a modification of the sealing means of Figure 5.

Like parts are designated by like characters throughout the specification and the drawings.

The self-aligning pulley of the present invention, intended as it is primarily for embodiment in large diameters, is preferably mainly hollow. In the form illustrated herewith the pulley includes a shaft 1 which is carried at each end in bearings 2, 2 which may be of any desired construction. Two or more hubs 3, 3 are secured to the shaft 1 by keys 4 or otherwise. The hubs are preferably integral with spokes 5 which are secured to and may be integral with a drum portion 6. If desired, an annular enlargement 7 may be made integral with the drums 6 and the spokes merge with this annular portion 7. On its exterior the drum portion 6 is provided with pairs of ball races 8, 8. Overlying each pair of ball races there is a ball cage or retainer 9 which is perforated or otherwise shaped to receive the balls 10 or other equivalent anti-friction members.

Positioned on the pulley outwardly of the drum and in contact with the balls 10 is a plurality of arcuate surface members 11, each of which may be provided with grooves or ball races 12 within which the balls are positioned. These members as shown particularly in Figure 2 are curved concentrically with the drum portions 6 and each of them is grooved along each edge as at 13. Between each pair of members 11, 11 and fitting into adjacent grooves 13 is a retainer 14. As shown particularly in Figures 2 and 4, the retainer is an elongated strip which bridges the gap between adjacent surface members and fits into each of the adjacent surface members and thus tends to position and to retain these parts together.

Each of the surface members 11 is preferably provided in each of its ends with one or more rollers 15 or other equivalent anti-friction members. The purpose of the rollers 15 is to reduce friction which might otherwise occur between the ends of the surface members and the adjacent faces of the realigning means which will be described below.

Preferably yielding means are provided for yieldingly retaining the surface members in position and for yieldingly resisting outward or longitudinal movement of its parts with respect to the drum 6. In the particular form here shown the yielding means comprises a plurality of springs 16. There will ordinarily be at least two springs for each surface member. Each spring at one end passes through a perforation 16a in the drum and through a second perforation 17 which is positioned in the surface member. The spring is engaged upon a pin 18 and thus is held at one end to a surface member. At its other end the spring is hooked as at 19 to engage a suitable perforation 20 in a disc-like member 21 which is secured to the shaft 1 by any desired means.

At each end of the shaft 1 there is positioned a

member 22 which on one face may be any desired shape and may be reduced as at 23 and is secured to the shaft 1 by a set screw 24 or otherwise. Whatever the shape of the member 22, one face of that member is preferably convex as at 25. A correspondingly shaped concave, convex ball retainer 26 is positioned adjacent the surface 25 and retains a plurality of balls 27 or other equivalent anti-friction member. An annular wedge member 28 is positioned loosely about the shaft 1 and is provided with a concave face 29 which is of substantially the same radius and curvature as the convex face 25. The ball bearings 27 are in contact with the faces 25 and 29 and serve as an anti-friction means to permit relative movement of these surfaces and the parts upon which the surfaces are formed. The member 28 is preferably provided with a plan surface 30 which is positioned generally on the opposite side from the concave surface 29. A ball cage or retainer 31 is positioned freely about the shaft 1 and carries balls 32 which are in contact with the face 30 of the member 28. An anti-friction disc or washer 33 is also positioned freely about the shaft 1 and one of its faces is in contact with the balls 32 while its opposite face is in contact with the balls 15 of the surface members 11. While only one end of the total pulley is shown in detail in Figure 3, the structure just described is duplicated as shown in Figure 1 for each end of the pulley.

As mentioned above, the invention may be embodied in a pulley for a rotor, a wheel or other rotary member. In the form shown it is embodied in a pulley which drives a belt and, as indicated in Figure 1, the shaft 1 is secured to the gear 34 by means of which it may be driven and there is positioned about the pulley a belt 35 which belt is in contact with the outer surface of the surface members 11. At its opposite end the belt 35 is positioned about a pulley 36 which is of standard or conventional form since it has no self-aligning arrangement or mechanism. The pulley 36 may be carried on a shaft 37 which is received in bearings 38 or is otherwise supported. Obviously, both pulleys might be arranged identically and thus each might be self-aligning, but for many purposes it is sufficient if one pulley is provided with the self-aligning feature, and experience has shown satisfactorily that where only two pulleys are involved, the belt can be held in satisfactory alignment if only a single pulley is arranged to accomplish automatic self-aligning. Where many pulleys are to be used, for example a conveying system, more than one would ordinarily be arranged for self-aligning. The pulleys may be used with a belt of any design and are not limited to the particular belt shown, which is merely indicated in the form of a conventional, flexible belt which may be made of any suitable material or combination of materials. The pulley may also be used without a belt.

This application is a continuation, in part, of my application Serial No. 451,003, filed July 15, 1942, which is itself a division of my application Serial No. 410,871, filed September 15, 1941, and now Patent 2,301,542, issued November 14, 1942.

The first four figures show material from the parent case. Figures 5 to 12, inclusive, show modifications of the material shown in the parent case.

The modified structures of Figures 5 to 8, inclusive, show substantially the form of the device shown in the earlier figures, except for the provision of means for preventing the entrance of foreign matter into the bearings and between the adjacent surfaces of movable parts. In general, the structure is the same as that shown in the first figures, but because of the minor modifications, it will be described in connection with different reference characters.

There is thus a shaft 39 which may be threaded, as at 40, and reduced, as at 41, to be received in a bearing 42 carried in a bearing housing 43. A packing and sealing assembly 44 is positioned about the reduced portion 41 and is arranged to retain lubricant and to exclude foreign matter. A locking and adjusting ring 45 is threaded upon the threaded portion 40 and is held in adjusted position by a lock screw 46. A member 47 corresponds generally to the member 22. It is, however, threaded for adjustment along the threaded portion 40 of the shaft 39, and the lock nut 45 is used to hold it in adjusted position. It is provided with a convex surface 48 which corresponds generally in curvature and function to the convex surface 25 of the member 22. It has been reduced and cut away, however, for purposes of weight reduction.

A number of ball or other anti-friction bearings 49 are in contact with the convex surface 48, and these balls are preferably mounted in a curved member 50 which serves as a guide and cage for them. The member 50 has secured to it adjacent its outer edge a pair of packing rings 51 which are arranged to exclude dust and other foreign matter. The rings 51 are provided with openings or pockets 52, which openings provide room for the balls. The result of this is to provide packing and protection means both outside of and inside of the balls 49.

A member 53 which corresponds generally to the member 28 of the earlier figures is provided with a concave surface 54 and is positioned in contact with the balls 49 and the packing rings or members 51 and 52. The curvature of the concave surface corresponds to and is preferably concentric with the curvature of the convex surface 48 of the member 47. The member 53 may be provided with a flat surface 55, which corresponds to the surface 30 of the member 28 in Figure 3.

In contact with this flat surface are one or more series of balls or other anti-friction members 56. These are held in place by a cage and guiding member 57 which, in the particular form shown, is a disk and is provided with openings 58 in which the balls are received. About the edge of the cage member 57 on each side is provided a packing disk 59, which is provided with perforations or pockets 60. The packing disks are provided, as shown in Figures 5 and 8 in particular, on each side of the member 57, and the openings 60 correspond with the openings 58, and the balls 56 fit within these openings, and thus means are provided for preventing the entrance of foreign matter. The rings 59, as well as the rings 51, may be riveted, cemented or otherwise fastened to their respective members 57 and 50.

If desired, the member 47 may, as shown in Figure 12, be modified to serve as a retainer for the packing rings 51. This modification comprises merely an overlapping peripheral lip 61, which serves to position and to retain one of the packing rings 51, and in this modification the member 50 has been omitted and in its place is provided a concavo-convex ring or annular disk 62.

The balls 56 are arranged to contact a disk 63, which is itself contacted by balls 64. The balls

are mounted in the surface members 65, which correspond to the surface members 11 of Figure 3, for example. Positioned about each of the balls 64 is a packing ring 66 which serves to keep dust and dirt away from the ball and away from its point of contact with the disk 63 and with the bearing surfaces in the depression in the surface member 65 within which each ball lies.

The construction thus far described in connection with the modifications of Figures 5 to 8, inclusive, and Figure 12 comprises merely modifications of the structure shown in the first four figures, arranged for lightness and for additional security against the entrance of foreign matter.

The rotor or pulley itself is substantially the same as that shown in the earlier figures. As above mentioned, it is supported on a shaft 39, and it includes surface members 65. In addition to these parts, there is a drum 67 which is supported by spokes 68 on hubs 69, which are keyed to the shaft 39 by keys 70. Each end of the drum may, if desired, be closed by a closing plate 71, which serves to exclude foreign matter from the interior of the drum. Each surface member is provided on its inner face with one or more ball races 72 within which balls 73 are positioned.

The drum 67 is provided with corresponding or mating ball races 74, so that each of the balls is retained for movement within a composite ball race formed in part by one member 72 and in part by a corresponding member 74. The retainers 14, shown for example in Figures 2 and 4, have been omitted from the construction shown in Figures 5 to 8, inclusive, and instead packing means are shown. These may comprise curved plate-like members 75 which have upstanding central portions 76. The plate-like portions 75 are, on their lower surfaces, surrounded by packing material 77 which is in contact with the outer surface of the drum 67, and on their upper faces the members 75 are provided with packing material 78 which is in contact with the inner or lower faces of the surface members 65. An additional packing section or portion 79 is arranged to overlie both sides of the upstanding members 76. The plate-like members 75 are perforated to permit the seating of the balls 73 in the positions shown.

The packing construction just described protects the bearing surfaces and the walls from the entrance of foreign matter and serves also as a lubricant retaining means.

The surface members 65 may be held against outward displacement by almost any desired means. As shown, this is accomplished by a plurality of springs 80. Each spring 80 is secured at one end, as at 81, to a spider or retaining ring 82 which is perforated to receive the spring and is itself fastened by a collar 83 to the shaft 39. Any desired number of springs may be used. Ordinarily there will be at least two sets of springs, so that each surface member is held in place yieldingly by two sets of springs. At its outer end each spring 81 is secured in a perforation 84 which is formed in the surface member to which it is attached. It engages a part 85 and is covered by a packing member 86 so that foreign matter cannot enter through this opening. The details of the members 85 and 86 may be very widely varied, and it is sufficient only that there be a member which can be engaged by the end of the spring 80 to prevent the displacement of the spring and that there be a closure for the opening so that the entrance of foreign matter is prevented.

As shown in Fig. 5, a belt 35 indentical with the belt of Figures 1 and 2 is in contact with the rotor. Almost any sort of belt might be used.

One of the modified forms of belts is shown in Figure 9. It comprises a belt 87 which is formed to produce longitudinal openings or slots 88.

A further modification appears in Figure 10, in which a belt 89 is provided with perforations 90.

As shown in Figure 11, an open-meshed belt 91 is shown. It is to be understood that any of the forms of perforated or open-work belts may be made of any desired material, fabric, textile, synthetic or a mixture of any of these. If made of fabric, it may be formed of fibers—woven, compacted or felted, or otherwise formed into a belt, and the fibers may be of any material—animal, mineral, vegetable, synthetic, metallic or of any other material. For some purposes, where an open-work belt is to be used, it is desirable to use with it an auxiliary belt which serves as a filtering or carrying member. In the paper industries, for example, a metallic belt of woven mesh, as suggested in Figure 11, might be used, and such a belt would normally have, in addition, a felt belt or mat overlying it.

Although I have shown an operative form of my invention, it will be recognized that many changes in the form, shape, and arrangement of parts can be made without departing from the spirit of the invention, and my showing is, therefore, to be taken as, in a sense, diagrammatic. In particular, the device of the first four figures may be used in any association where a rotor with automatic aligning features is desirable and if it is used as a driving, driven or idling member associated with a belt. The word "belt" in the specification and the claims is to be taken as meaning any element which, when associated with a rotor, has the general properties of a belt. This may be a solid member made of any material and of any construction, or it may be a mesh, perforated or open-work member made of any material, and it may have associated with it a mat, straining, filtering or any other member so that it may be used with liquids or with solids, wet or dry.

The particular details of the sealing construction of Figures 5 to 12, inclusive, may be widely varied. Their general purpose is to provide means which prevent the entrance of foreign matter, solid, liquid or mixed, into the space between the relatively movable spaces, whether those spaces be in contact with each other or not. The device of this invention may operate in liquids or may be subjected to liquids during operation, and the packing material is such as to exclude these liquids from the mechanism. The exposed parts, or in fact all of the parts, may be given a coating or lacquer or other material to retain them rust and acid-proof.

The use and operation of this invention are as follows:

Considering the pulley arrangement shown in the figures, it may be assumed that the belt is in proper alignment with respect to the pulley as shown in Figures 1 and 3. If now the pulley is driven or if it rotates with respect to the belt or to any other surface member, the danger of relative misalignment occurs, and this may occur whether or not the pulley is itself driven or acts merely as an idler. So far as the self-aligning features are concerned, the operation is substantially the same whether the pulleys be driven or idling.

Assuming now that the two pulleys shown in

Figure 1 are rotating and that the belt is moving, misalignment may, of course, occur. When it does it will occur to the right or to the left, and if it be assumed that the belt moves to the left from the position of Figure 3, it will contact and may "climb up" on the left wedge ring 28. Because that ring fits loosely about the convex member 25, the weight or pressure or other force of the belt will tend to depress a wedge ring 28 tilting it downwardly from the position of Figure 3. Due to the influence of the convex surface 25 of the member 22, when the ring 19 moves downwardly along that convex surface its upper edge moves to the right and exerts a pressure upon the uppermost surface member 11. This pressure or thrust is directed to the right from the position shown in Figures 1 and 3 and thus the upper or outer surface member 11 is forced to the right and this thrust is transmitted to the oppositely positioned or right hand wedge member 28. Since the construction at each end of the pulley is the same, the thrust of the uppermost surface member 11 toward the right is exerted on the upper portion of the right hand wedge ring 28 and forces the upper portion of that member to the right. As this member is forced to the right it rises upwardly about the right hand convex surface 25 of the right hand member 22 and thus the lower edge of the right hand wedge ring 28 is forced to the left. When it is forced to the left it forces the lowermost surface member 11 to the left.

As a result of the movements above described, when, for example, the uppermost surface member 11 is carried to the right because the belt has climbed upon the left hand wedge ring 28, the corresponding lowermost surface member 11 is moved to the left. That is to say it moves directly in the opposite direction from that of the movement of the uppermost surface member.

As a result of the movement of the surface members 11 above described, the misalignment of the belt to the left, for example, has caused the two oppositely placed surface members to shift axially with respect to the shaft 1. As the uppermost member 11 is moved to the right, since it is the one against which the greatest load of the belt is pulling at that time, it carries the belt bodily to the right and thus tends to some degree at least to correct the misalignment. This effect is continued or may be continued as the pulley revolves and, should the belt move too far to the right the same cycle of operation will occur but with the directions reversed so that the uppermost pulley member 11, should the belt move too far to the right, will be forced to the left and will guide the belt back. It will thus be seen that means are provided at each end of the pulley against which or upon which a misaligned belt can exert pressure. That pressure when exerted forces one or more of the relativey movable surface members to move in the direction opposite that in which the misalignment has taken place.

I claim:

1. In combination in a pulley a pulley body, a plurality of members adapted to contact a belt, said members being mounted for endwise movement along the pulley, and springs secured to said members and tending to resist their movement, and means for imparting endwise movement for one of said members in one direction, in response to endwise movement of another of said members in an opposite direction, and parts positioned between adjacent belt contacting members and penetrating into said members.

2. In combination in a pulley a pulley body, a plurality of members adapted to contact a belt, said members being mounted for endwise movement along the pulley, and springs secured to said members and tending to resist their movement, and means for imparting endwise movement for one of said members in one direction, in response to endwise movement of another of said members in an opposite direction, and rolling parts positioned between said body and said members, there being cages positioned to overlap adjacent members and shaped to receive said roller parts, and parts positioned between adjacent belt connecting members and penetrating into said members.

3. In combination in a pulley a pulley body, a plurality of members adapted to contact a belt, said members being mounted for endwise movement along the pulley, and springs secured to said members and tending to resist their movement, and means for imparting endwise movement for one of said members in one direction, in response to endwise movement of another of said members in an opposite direction, and rolling parts positioned between said body and said members, there being cages positioned to overlap adjacent members and shaped to receive said roller parts.

4. In combination in a pulley a pulley body, a plurality of members adapted to contact a belt, said members being mounted for endwise movement along the pulley, and springs secured to said members and tending to resist their movement, and means for imparting endwise movement for one of said members in one direction, in response to endwise movement of another of said members in an opposite direction, and means engaging the edges of adjacent members.

5. In combination in a pulley a pulley body, a plurality of members adapted to contact a belt, said members being mounted for endwise movement along the pulley, and springs secured to said members and tending to resist their movement, and means for imparting endwise movement for one of said members in one direction, in response to endwise movement of another of said members in an opposite direction, and means engaging the edges of adjacent members, said means penetrating into the edges of adjacent members.

6. In combination in a pulley a pulley body, a plurality of members adapted to contact a belt, said members being mounted for endwise movement along the pulley, and springs secured to said members and tending to resist their movement, and means for imparting endwise movement for one of said members in one direction, in response to endwise movement of another of said members in an opposite direction, and means engaging the edges of adjacent members, said means penetrating into the edges of adjacent members, and positioned below the outer surface and above the inner surface of said member .

7. In combination in a pulley a pulley body, a plurality of members adapted to contact a belt, said members being mounted for endwise movement along the pulley, and springs secured to said members and tending to resist their movement, and means for imparting endwise movement for one of said members in one direction, in response to endwise movement of another of said members in an opposite direction, and rolling parts positioned between said body and said members, there being cages positioned to overlap adjacent members, and shaped to receive said roller parts, and means engaging the edges of adjacent members.

8. In combination in a pulley a pulley body,

a plurality of members adapted to contact a belt, said members being mounted for endwise movement along the pulley, and springs secured to said members and tending to resist their movement, and means for imparting endwise movement for one of said members in one direction, in response to endwise movement of another of said members in an opposite direction, and rolling parts positioned between said body and said members, there being cages positioned to overlap adjacent members, and shaped to receive said roller parts, and means engaging the edges of adjacent members, the longitudinal edges of the belt contacting members being slotted, the said engaging means penetrating into the slots of adjacent members.

9. In combination in a pulley, a plurality of members adapted to contact a belt, said members being mounted for endwise movement along the pulley, and means for imparting endwise movement to one of said members in one direction in response to endwise movement of another of said members in an opposite direction, and means engaging adjacent belt contacting members.

10. In combination in a pulley, a plurality of members adapted to contact a belt, said members being mounted for endwise movement along the pulley, and means for imparting endwise movement to one of said members in one direction in response to endwise movement of another of said members in an opposite direction, and means engaging adjacent belt contacting members, said means penetrating into adjacent members.

11. In combination in a pulley, a plurality of members adapted to contact a belt, said members being mounted for endwise movement along the pulley, and means for imparting endwise movement to one of said members in one direction in response to endwise movement of another of said members in an opposite direction, and means engaging adjacent belt contacting members, said means penetrating into adjacent members, and springs, each spring engaging one surface member and a portion of the pulley and tending to resist movement of the said member.

12. In combination in a self-aligning rotor, a rotor body, a plurality of surface members movably carried thereby, and forming a contacting surface, and means positioned between each pair of adjacent surface members and inter-penetrating each of them, and movable means adjacent said surface members and positioned to have contact with a surface with which the self-aligning rotor is in contact, and to be moved by such surface contact, said movable means being effective, when moved by contact with said surface, to move in the direction opposite to that of misalignment, and thereby to compensate for said misalignment.

13. In combination in a self-aligning rotor, a rotor body, a plurality of surface members movably carried thereby, and forming a contacting surface, said surface members being slotted along their longitudinal edges and a plurality of parts positioned one between each pair of surface members and lying partially within said slots, and movable means adjacent said surface members and positioned to have contact with a surface with which the self-aligning rotor is in contact, and to be moved by such surface contact, said movable means being effective, when moved by contact with said surface, to move in the direction opposite to that of misalignment, and thereby to compensate for said misalignment.

14. In combination in a pulley a pulley body, a plurality of members adapted to contact a belt, said members being mounted for endwise movement along the pulley, and means secured to said members and tending to resist their movement, and means for imparting endwise movement for one of said members in one direction, in response to endwise movement of another of said members in an opposite direction, and parts positioned between adjacent belt-contacting members and penetrating into said members.

15. In combination in a pulley a pulley body, a plurality of members adapted to contact a belt, said members being mounted for endwise movement along the pulley, and springs secured to said members and tending to resist their movement, and means for imparting endwise movement for one of said members in one direction, in response to endwise movement of another of said members in an opposite direction, and parts positioned between adjacent belt-contacting members and overlapping the margin of said members, and means for preventing the entrance of foreign matter between said pulley body and said belt-contacting members and between the parts of said means for imparting endwise motion.

16. In combination in a pulley a pulley body, a plurality of members adapted to contact a belt, said members being mounted for endwise movement along the pulley, and means secured to said members and tending to resist their movement, and means for imparting endwise movement for one of said members in one direction, in response to endwise movement of another of said members in an opposite direction, and parts positioned between adjacent belt-contacting members and overlapping the margins of said members, and means for preventing the entrance of foreign matter between said pulley body and said belt-contacting members and between the parts of said means for imparting endwise motion.

17. In combination in a pulley a pulley body, a plurality of members adapted to contact a belt, said members being mounted for endwise movement along the pulley, and means for imparting endwise movement for one of said members in one direction, in response to endwise movement of another of said members in an opposite direction, and parts positioned between adjacent belt-contacting members and overlapping the margins of said members, and means for preventing the entrance of foreign matter between said pulley body and said belt-contacting members and between the parts of said means for imparting endwise motion.

18. In combination in a pulley a pulley body, a plurality of members adapted to contact a belt, said members being mounted for endwise movement along the pulley, and means for imparting endwise movement for one of said members in one direction, in response to endwise movement of another of said members in an opposite direction, and parts positioned between adjacent belt-contacting members and overlapping the margins of said members, and means for preventing the entrance of foreign matter between said pulley body and said belt-contacting members and between the parts of said means for imparting endwise motion, said preventing means comprising compressible packing material positioned between adjacent and relatively movable surfaces of said pulley and of said movement imparting means.

RUDOLF F. HLAVATY.