

May 29, 1923.

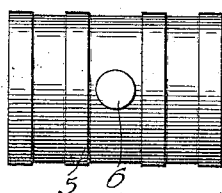
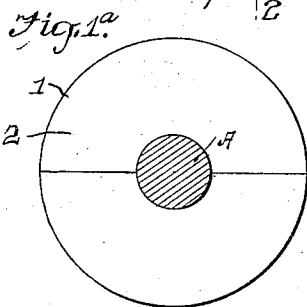
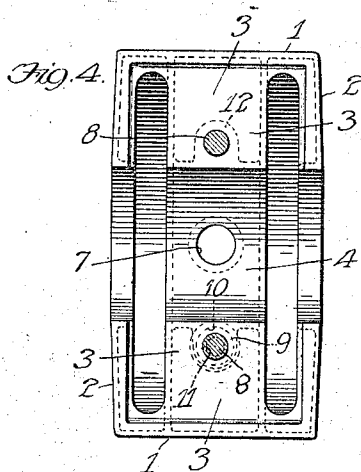
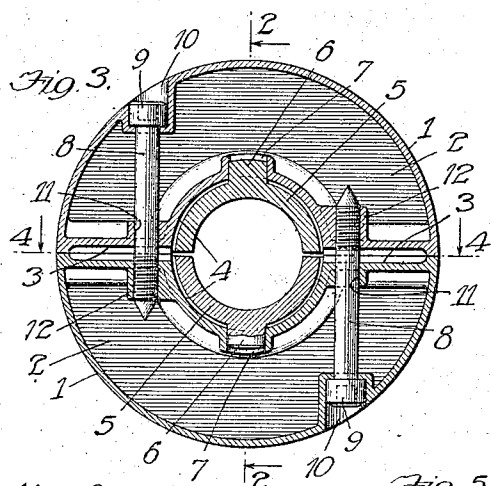
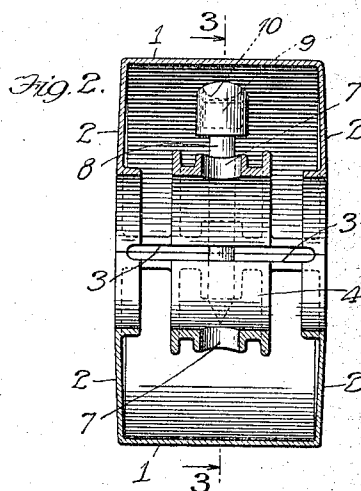
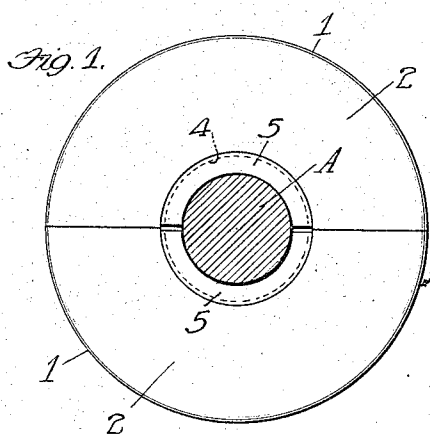
H. J. GILBERT

1,457,071

METAL PULLEY

Filed April 5, 1921

3 Sheets-Sheet 1



Witness
Martin H. Olsen

Inventor
Henry J. Gilbert
By Rector, Nibben Davis Macaulay
His Atty.

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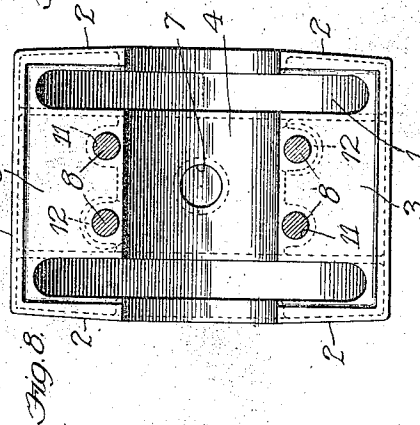
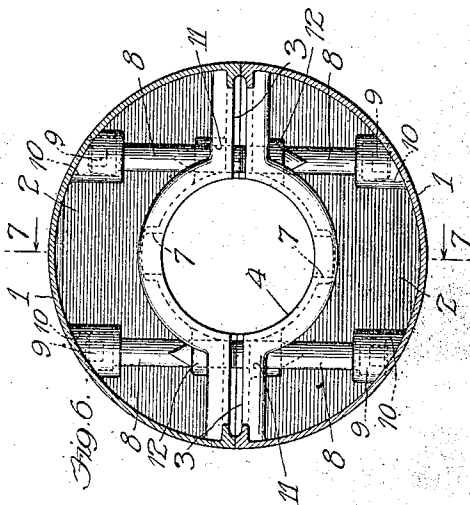
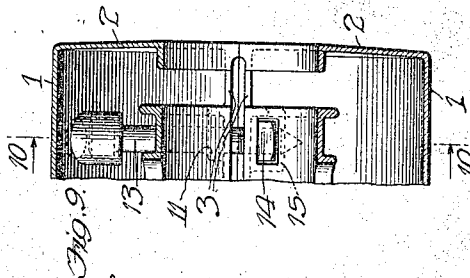
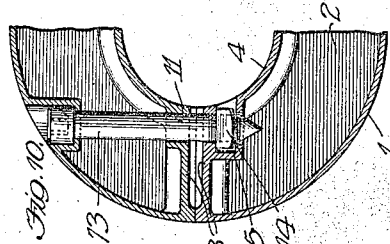
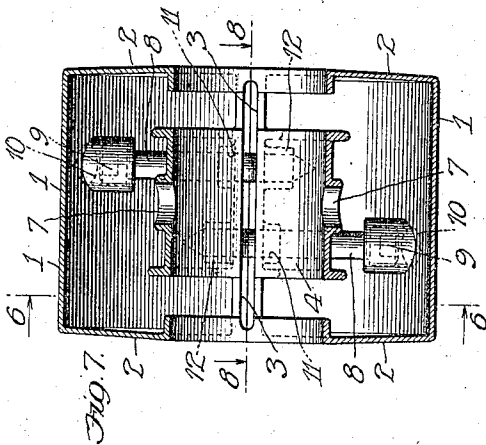
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METAL PULLEY

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3 Sheets-Sheet 2



Witness
Martin H. Olsen.

Inventor
Henry J. Gilbert
By: Rector, Kitten, Davis & Macaulay,
His Attys

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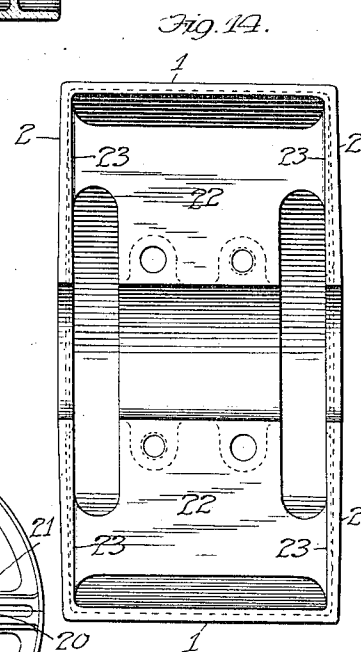
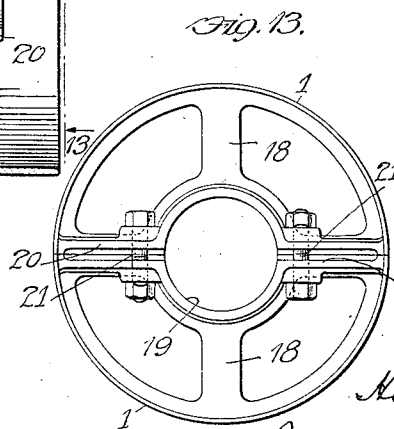
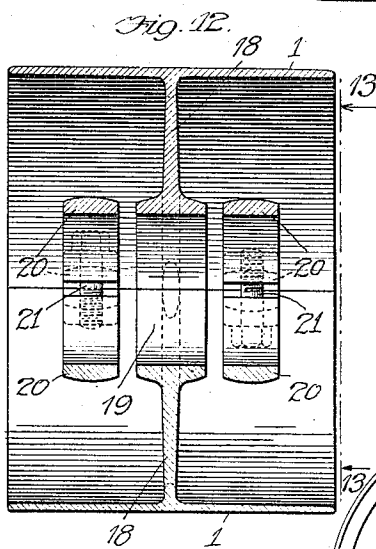
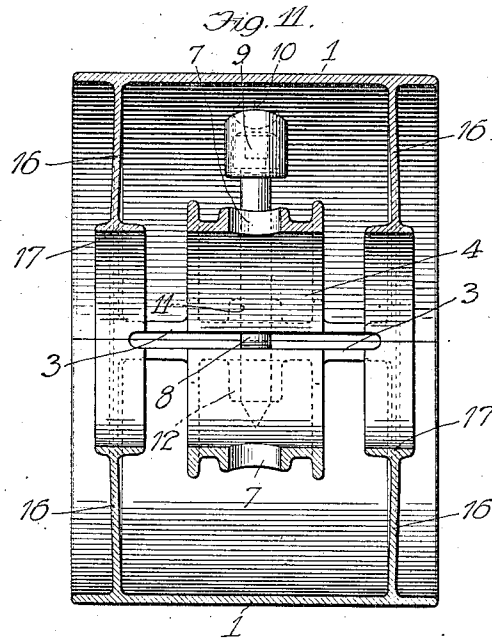
H. J. GILBERT

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METAL PULLEY

Filed April 5, 1921

3 Sheets-Sheet 3



Witness
Martin H. Olsen.

Inventor
Henry J. Gilbert
By Rector, Kibben, Davis & Macauley
His Attys

UNITED STATES PATENT OFFICE.

HENRY J. GILBERT, OF SAGINAW, MICHIGAN, ASSIGNOR TO SAGINAW MANUFACTURING COMPANY, OF SAGINAW, MICHIGAN, A CORPORATION OF MICHIGAN.

METAL PULLEY.

Application filed April 5, 1921. Serial No. 458,683.

To all whom it may concern:

Be it known that I, HENRY J. GILBERT, a citizen of the United States, residing at Saginaw, in the county of Saginaw and State of Michigan, have invented certain new and useful Improvements in Metal Pulleys, of which the following is a specification.

My invention relates to metal pulleys and the object thereof is to devise a simple and efficient construction of such a pulley of the split type characterized more particularly by the provision of clamping means and centering means which are independent of each other. The construction is such that when the two halves of the pulley are placed upon the shaft the centering means are in positive contact either direct or indirect with the shaft and the rim sections are in positive contact with each other, with the result that, when the clamping means are operated to clamp the pulley structure on to the shaft, the two halves cannot be drawn out of their true position with respect to the shaft. At the same time the continuous compression on the shaft due to the clamping means increases the compression of the two halves towards one another and gives added support for the pulley structure upon the shaft.

Other novel and advantageous features of construction such as lightness, strength and ease of putting the pulley structure on and off the shaft will be apparent from the description hereinafter given.

The inventive idea is capable of being embodied in a variety of mechanical structures some of which, for the purpose of illustrating the invention, are shown in the accompanying drawings, but it is to be expressly understood that such drawings are for the purpose of illustration only and are not designed to define the limits of the invention, reference being had to the appended claims for this purpose.

In the drawings Fig. 1 is an end elevation of a pulley structure embodying my invention in which the centering means indirectly contact; and Fig. 1^a is a like end elevation of a pulley in which the centering means contact directly with the shaft; Fig. 2 a section on the line 2—2 of Fig. 3; Fig. 3 a section on the line 3—3 of Fig. 2; Fig. 4 a section on the line 4—4 of Fig. 3; Fig. 5 an elevation of a bushing; Fig. 6 a section on the

line 6—6 of Fig. 7; Fig. 7 a section on the line 7—7 of Fig. 6; Fig. 8 a section on the line 8—8 of Fig. 7; Figs. 9, 10, 11, 12 and 14 are sectional views illustrating other forms of the invention; and Fig. 13 is an end view of Fig. 12.

Referring to the particular embodiment as shown as in Figs. 1, 2, 3 and 4, the pulley which is of the split type comprises two pulley halves, each consisting of a rim section with radial webs which are here connected with the end edges of the rim sections, and a transverse web which is substantially diametrical; and also consisting of clamping means. The end webs constitute the centering means which are independent of the clamping means. As shown each pulley half is an integral casting or structure, but my invention in its broader aspect is not necessarily limited to such a structure inasmuch as it may be built up of different or separate parts to produce the final structure.

As shown each pulley half comprises a semi-circular rim section 1, two parallel and radial end webs 2 and transverse or diametrically disposed webs consisting of the two flat portions 3 and the central substantially semi-circular portion 4, adapted to fit upon the shaft A. In the present instance the webs 2 form substantially radial smooth surfaces completely closing the ends of the pulley except for the shaft opening, with the result that the lodgement or accumulating of dust, dirt or lint is impossible on or in the pulley. The inner adjacent edges of the rim sections of the two pulley halves and also the inner adjacent edges of the webs 2 are in positive contact with each other when the two pulley halves are brought together; but the transverse or diametrical webs 3 which are more or less resilient are out of contact but adapted to be brought or sprung toward each other by the clamping means in the manner hereinafter described. As shown in Figs. 3 and 4 the portions 3 are parallel to the diametrical line of the split of the pulley and are located on either side of such line.

The inner adjacent edges of the webs 2 are not only in positive contact with each other, but they also make contact with the shaft either indirectly through the bushing 5, Fig. 1, or directly with the shaft as shown in Fig. 1^a.

The bushing which is of the split type comprises two semi-circular portions 5 having radial lugs 6 which are adapted to be received in radial openings 7 in the central portion 4 of the transverse webs. It will be understood, of course, that the bushing 5 may be omitted and the pulley clamped directly to the shaft as shown in Fig. 1^a.

The clamping means herein shown for clamping the two pulley halves together consists of similar bolts 8 whose heads 9 are received within sockets 10 in the rims 1. Each bolt connects with its rim section, passing through the bottom of its socket and loosely through the transverse opening 11 in its flat web portion 3 and then engages the web portion 3 of the other pulley half, in the present instance by being screw threaded into a boss 12 in the last mentioned web portion.

The bolt head 9 has an angular socket to receive a wrench or other tool whereby such bolt can be screwed or unscrewed in the assembly and disassembly of the pulley. Inasmuch as the transverse webs are not in contact but separated a certain distance as shown in Figs. 2 and 3 and are moreover resilient, the same may be sprung toward each other by means of the clamping bolts and the pulley halves are thereby securely clamped together and on to the shaft A.

In practice, in the manufacture of this construction of pulley, the two halves are first clamped together with a slight strain thereon, whereupon the central opening through the pulley (minus the bushing) is accurately bored out to the same diameter as the shaft to which the pulley is to be applied. During this boring operation the transverse webs are preferably sprung towards each other, so that when the pulley halves are relieved of the clamping pressure the central opening is somewhat out of round. In the case of the bushing the same is turned on the outside to a true circle and is bored on the inside to a true circle concentric with the outside. As a result, when the pulley is actually applied to its shaft and clamping bolts are operated, the pulley halves are brought solidly together with the end webs in contact with the shaft and acting as a centering means and with a resilient clamping pressure due to the clamping means acting independently of the centering means.

The pulley illustrated in Figs. 1 to 4 is of small size and therefore has a single set of clamping bolts. However, this pulley structure may be made of different sizes, that is of different widths and diameters. For instance in Figs. 6, 7 and 8 I have shown my invention as embodied in a pulley of wider face or rim than in Figs. 1 to 4 in which case the number of clamping bolts is increased, being increased in the present

instance to two pairs of such bolts 8. In other respects the construction is the same as that above described.

In Figs. 9 and 10 I have shown a modified form of construction as to the clamping bolts 13 which are here provided with nuts 14 retained in a side pocket 15 in the web portions 3, each bolt thus engaging its nut 14 instead of engaging a screw threaded bore in such web portion.

In the above described embodiments the centering means are webs connected with the end edges of the rim sections but in the broader aspect of my invention the centering means may be otherwise constructed and otherwise arranged as shown in Figs. 11, 12 and 13. According to the structure shown in Fig. 11 the centering means consists of radial webs 16 having central hub openings 17 such webs being connected with the rim sections at points within the line of the edges of such sections. In other respects the construction is the same as shown in Figs. 2 and 3.

Referring to the construction shown in Figs. 12 and 13 the centering means consists merely of one set or pair of webs which moreover are arranged at the central portion of the pulley structure with a set or pair of clamping means arranged on either side and axially thereon. The centering means here consists of the webs 18 having central hub portions 19, such webs being connected with the central portion of the rim sections. The clamping means comprise transverse members 20 which are spaced apart and are somewhat resilient and are clamped together by means of the bolts 21.

Fig. 14 illustrates a construction according to which the transverse web portions 22 corresponding to the web portions 3 instead of being connected directly with the rim sections are here shown as connected directly with the sides of the webs 2 along the lines 23. In other respects the construction is the same as shown in Figs. 2 and 3.

I claim:

1. A metal pulley adapted for use on a shaft and formed in two halves, said pulley comprising rim sections, means clamping the pulley on the shaft, and automatic centering means resisting the distorting action on the rim when the clamping means are applied, whereby clamping and centering are simultaneously effected.

2. A metal pulley adapted for use on a shaft and formed in two halves, said pulley comprising rim sections, means clamping the pulley on the shaft, and automatic centering means connected to the rim sections and supporting the same against the distorting strains of the clamping means, whereby clamping and centering are simultaneously effected.

3. A metal pulley adapted for use on a

shaft and formed in two halves, said pulley comprising rim sections, resilient means clamping the pulley on the shaft, and automatic centering means resisting the distorting action on the rim when the clamping means are applied, whereby clamping and centering are simultaneously effected.

4. A metal pulley adapted for use on a shaft and formed in two halves, such pulley comprising rim sections, clamping means including resilient webs and clamping bolts cooperating therewith, and centering means sustaining the rim sections against the strains imposed by the clamping means.

5. A metal pulley adapted for use on a shaft and formed in two halves, such structure comprising rim sections, centering means fitting positively on the shaft and acting to center the pulley sections on the shaft in advance of any clamping action, and clamping means normally spaced from the shaft and capable of being applied to clamp the pulley to the shaft without disturbing the centering means.

6. A metal pulley structure adapted for use on a shaft and formed in two halves, such structure comprising rim sections, clamping means, and centering means cooperating with the shaft for centering the pulley thereon, said centering means including pairs of webs on opposite sides of the clamping means and having hub portions bearing on the shaft and acting to resist any non-centering strains incident to the clamping action.

7. A metal pulley structure adapted for use on a shaft and formed in two halves, such structure comprising rim sections, clamping means connected with said sections and clamping the shaft, and centering means comprising radial webs connected to the rim sections and having hub-portions bearing on the shaft and resisting any deforming strains applied to the rim sections by the clamping means.

8. A metal pulley structure adapted for use on a shaft and formed in two halves, such structure comprising rim sections, clamping means connected to said sections and cooperating with the shaft, and centering means connected to said rim sections and cooperating with the shaft, said centering means comprising webs having hub-portions fitting on the shaft in advance of the clamping action, and said clamping means comprising diametrically disposed webs with central openings for the shaft, and clamping bolts, the bolt of each pulley half connecting its rim section with the diametrical web of the other pulley half.

9. A metal pulley which is split into two halves, each half comprising a rim, parallel webs extending radially from the edges of the rim, and a web extending transversely

and connecting the opposite ends of the rim, and means cooperating with the transverse webs for securing the two pulley halves together.

10. A metal pulley which is split into two halves, each half comprising a rim, parallel webs extending radially from the edges of the rim, and a web extending transversely and connecting the opposite ends of the rim, and means for securing the two pulley halves together consisting of clamping bolts each anchored in a rim and passing through its transverse web and engaging the transverse web of the other pulley half.

11. A metal pulley which is split into two halves, each half comprising a rim, parallel webs extending radially from the edges of the rim, and a web extending transversely and connecting the opposite ends of the rim, said transverse web consisting of a central semi-circular portion and two flat portions connecting the opposite ends of the rim and arranged parallel to and inwardly of the diametrical line of split of the pulley, and means for securing the two pulley halves together.

12. A metal pulley which is split into two halves, each half comprising a rim, parallel webs extending radially from the edges of the rim, and a web extending transversely and connecting the opposite ends of the rim, said transverse web consisting of a central semi-circular portion and two flat portions connected with the rim and arranged parallel to and inwardly of the diametrical line of split of the pulley, and means for securing the two pulley halves together consisting of clamping bolts engaging respectively the pulley rims and the flat portions of the web.

13. A metal pulley which is split into two halves, each half comprising a rim, parallel webs extending radially from the edges of the rim, and a web extending transversely and connecting the opposite ends of the rim, and means for securing the two pulley halves together, the adjacent edges of the rims and end webs being in contact when the two pulley halves are secured together, and the two transverse webs being separated and out of contact with each other.

14. A metal pulley which is split into two halves, each half comprising a rim, parallel webs extending radially from the edges of the rim, and a web extending transversely and connecting the opposite ends of the rim, and means for securing the two pulley halves together, the two transverse webs being resilient and separated from each other but adapted to be drawn towards each other, and clamping means cooperating therewith.

15. A metal pulley which is split into two halves, each half comprising a rim, parallel webs extending radially from the edges of the rim, and a web extending transversely

and connecting the opposite ends of the rim, said web consisting of a central semi-circular portion and two flat portions connected with the rim and arranged parallel to and inwardly of the diametrical line of split of the pulley, said central portion of the transverse web forming a central shaft opening when the pulley halves are together, a split bushing in said central opening, and means for clamping the pulley halves together, the openings in the transverse web being out-of-round when the pulley halves are not

clamped together but in-round when clamped together.

16. A metal pulley which is split into two halves, each half being a closed integral structure comprising a rim, and parallel webs extending radially from the edges of the rim, and a web extending transversely and connecting the opposite ends of the rim, and means for securing the two pulley halves together.

HENRY J. GILBERT.