

Dec. 19, 1939.

M. L. FYKSE

2,184,183

METHOD OF MAKING FLEXIBLE SHAFT COUPLINGS

Filed Oct. 11, 1937

2 Sheets-Sheet 1

Fig. 1.

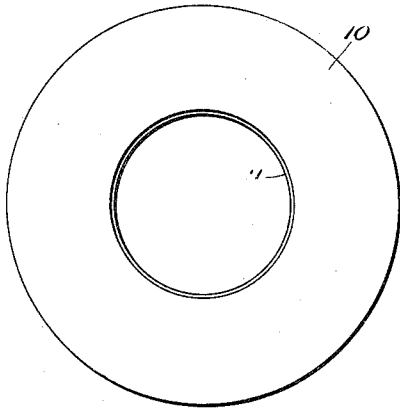


Fig. 2.

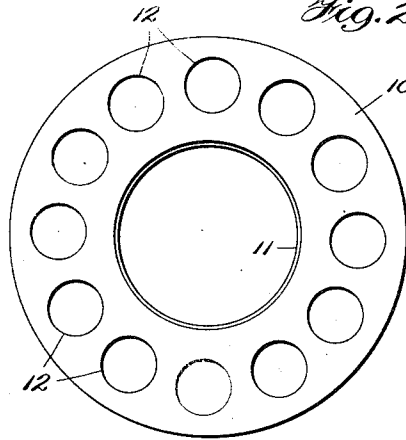


Fig. 3.

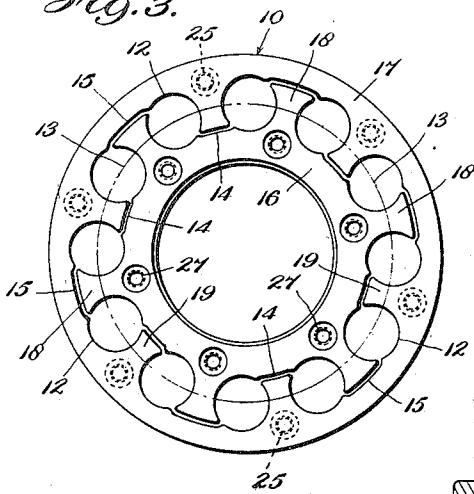


Fig. 4.

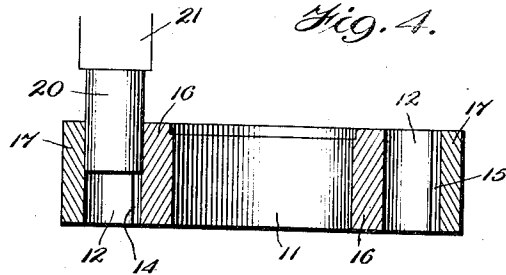
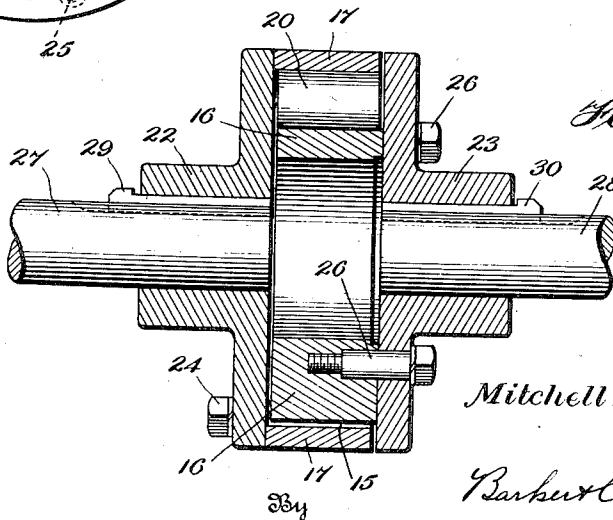


Fig. 5.



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Fig. 6.

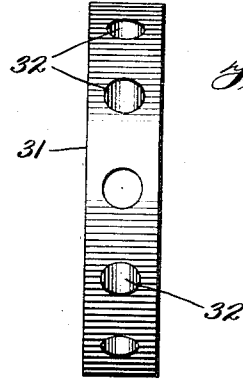
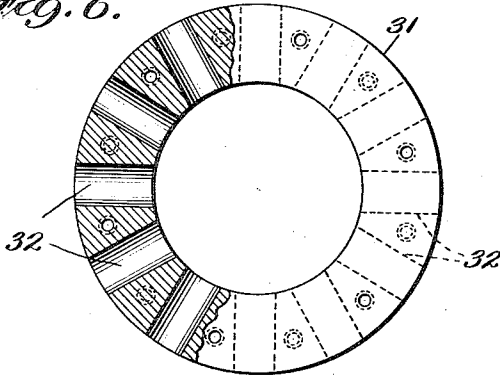


Fig. 7.

Fig. 8.

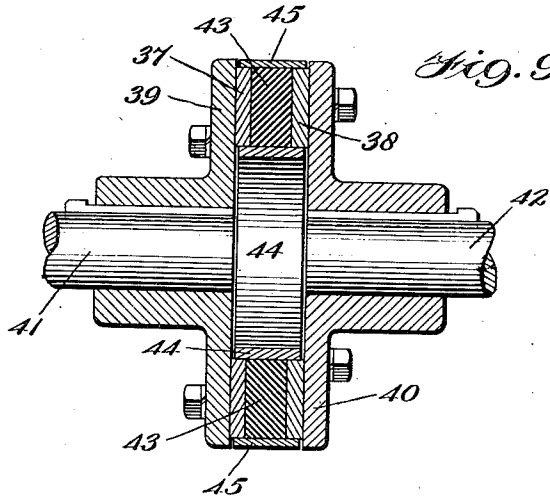
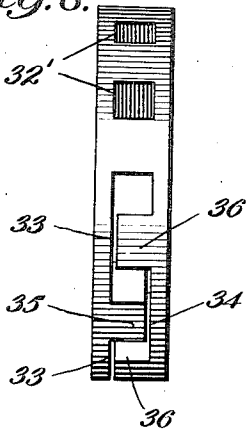


Fig. 9.

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METHOD OF MAKING FLEXIBLE SHAFT COUPLINGS

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Application October 11, 1937, Serial No. 168,481

3 Claims. (Cl. 29—148)

The invention relates to flexible shaft couplings, and has for its principal object the provision of a simple, an expeditious and comparatively inexpensive method of producing the same.

5 With this and other objects in view which will appear as the description proceeds, the invention consists in the novel steps and combinations of steps constituting the method of manufacture, more fully hereinafter described and particularly
10 pointed out in the appended claims.

In order that the invention may be the better understood, two forms of the coupling and the procedure involved in its manufacture have been illustrated in the accompanying drawings forming a part of this specification in which like parts
15 are designated by like reference characters in all the views, and in which

Figure 1 is a face view of the blank from which the coupling elements are formed;

20 Fig. 2 is a similar view, showing the blank at the conclusion of the first step in the production of one type of the coupling;

Fig. 3 is a similar view, illustrating the blank at the end of the second step;

25 Fig. 4 is a cross sectional view, illustrating the third step;

Fig. 5 is a longitudinal sectional view, showing a completed assembled coupling of this type;

30 Fig. 6 is a face view, partly in section, illustrating the first step in the production of a modified form of the coupling;

Fig. 7 is an edge view of the element shown in Fig. 6;

35 Fig. 8 is an edge view illustrating the succeeding steps in the formation of this type of element; and

Fig. 9 is a longitudinal sectional view of an assembled coupling of the modified type.

40 In constructing coupling elements of the first type in accordance with the present method, a blank 10, see Fig. 1, in the form of a disk of metal, fiber or other rigid material is provided which may have a central aperture 11 for the purpose of saving metal and lightening the construction,
45 although this is not absolutely essential. This disk is then provided with a series of spaced longitudinally extending apertures 12 preferably arranged substantially concentric about the disk axis as illustrated in Fig. 2. Although these apertures are usually circular as here shown because
50 of the facility with which such holes may be drilled, insofar as the operation of the coupling is concerned they may be square, rectangular or of any polygonal shape.

55 The next step is to sever the material between

adjacent apertures as indicated in Fig. 3. This severance may take place along the center line circle 13 of the series of apertures but is preferably done in the manner shown in the said figure. That is to say, the material between a pair
5 of adjacent apertures is severed inwardly of said center line circle as indicated at 14 while the severance between the next adjacent aperture to either side of the first pair is outwardly of said
10 center line circle as indicated at 15. There is thus provided, when such severing step has been completed, a pair of complementary coupling elements 16 and 17, the former of which has a plurality of teeth or projections 18 extending radially outwardly from its periphery while the latter
15 has a corresponding set of radial projections 19 extending radially inwardly. As will be readily understood from said Fig. 3 these projections overlap radially.

20 With the members 16 and 17 in the position shown in Fig. 3 the next step comprises the insertion of rubber or other yielding or resilient plugs 20 into the apertures 12 as illustrated in Fig. 4 wherein one of the members 20 is shown as being
25 forced into an aperture 12 by means of a pressure member 21.

When plugs have been inserted in all of the apertures 12 a coupling unit results in which there is no metal to metal contact between the elements 16 and 17 at any point while at the
30 same time the resilient plugs 20 will permit of relative movement between the two elements 16 and 17 either circumferentially or transversely so as to accommodate any inequalities of alignment in two shafts to which the coupling is applied. The unit whose construction has just been
35 described is assembled as such between a pair of flanged collars 22 and 23 with the element 17 being secured to the flange of collar 22 by suitable bolts 24 engaging threaded apertures 25
40 formed in the element, while the element 16 is in like manner secured to the flanged collar 23 by bolts 26 threaded into apertures 27 formed in the element 16. The collars 22 and 23 are in turn keyed upon the aligned shafts 27 and 28 as shown
45 in Fig. 5 by means of suitable keys 29 and 30.

The severance of the material between the apertures as indicated at 14 and 15 in Fig. 3 may be accomplished by sawing or in the case of a metal disk the material may be burnt through
50 with a torch.

As will be readily understood from the above, the invention provides a method whereby the flexible coupling elements may be rapidly produced at relatively small cost since the machine
55

work involved may all be done either on a lathe or in a drill press.

The coupling thus produced furnishes a flexible drive adapted to accommodate either axial or angular misalignment, and is silent in action at all speeds since it is perfectly balanced and there is no metal to metal contact. Its diameter is relatively small, thus keeping its inertia low, and its outer face is smooth and free from projections, which enhances its safety. It can be easily dismantled for replacement of the resilient plugs, which are the only parts subject to wear, by merely removing the bolts 24 and 26, whereupon the unit comprising the elements 16 and 17, and plugs 20, may be bodily slid transversely from between the flanges of members 22 and 23, without sliding either of said members upon its shaft or disturbing its key. It requires no attention in operation, and need not be lubricated as this may have a deleterious effect upon the rubber plugs.

In making the modified form of coupling shown in Fig. 9, an annulus 31 is employed, which is first drilled to provide a series of circumferentially spaced radial holes 32, see Figs. 6 and 7. These holes may be left circular, as shown in Fig. 7, or they may be broached to a square, rectangular or other shape, as indicated at 32' in Fig. 8. In either case, the material between adjacent holes is next severed, as by sawing or torch cutting, the severance taking place alternately to the left and to the right, as indicated at 33 and 34 in Fig. 8, to provide two complementary rings having interengageable axially extending teeth or lugs 35 and 36 respectively.

As shown in Fig. 9, the said rings 37 and 38 are bolted or otherwise secured to the flanges 39 and 40, keyed respectively to the shafts 41 and 42 to be coupled. Rubber or other suitable resilient plugs 43 are introduced between the axially overlapping teeth or lugs 35 and 36 of the rings 37 and 38, and provide a yielding flexible drive without metal to metal contact, as in the preceding form. Inner and outer retaining rings 44 and 45 are preferably pro-

vided to prevent the resilient elements 43 from working radially inward or outward.

What is claimed is:

1. The method of making flexible shaft couplings and the like, which comprises forming in a rigid disk an endless series of arcuately spaced apertures extending completely through said disk; severing the material between adjacent apertures alternately in different planes to provide a pair of companion coupling elements having complementary overlapping spaced projections; and inserting resilient plugs into the spaces between said projections to provide a yielding drive between them.

2. The method of making flexible shaft couplings and the like, which comprises forming in a rigid disk an endless series of spaced apertures extending completely through said disk longitudinally and arranged substantially concentrically around the disk axis; severing the material between adjacent apertures substantially tangential thereto, and alternately radially inwardly and outwardly of the center line of the series, to produce complementary coupling elements having a series of radial projections extending outwardly and inwardly from their outer and inner peripheries respectively; and forcing resilient plugs into said apertures intermediate said projections.

3. The method of making flexible shaft couplings and the like, which comprises forming in a rigid disk a circumferential series of spaced apertures extending radially through the disk intermediate its opposed flat faces; severing the material between said apertures intermediate said faces, the severance between adjacent apertures being alternately in different planes which are substantially parallel and adjacent to said faces, thereby producing a pair of companion coupling elements having complementary longitudinally overlapping spaced projections; and inserting resilient plugs in the spaces between said projections.

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