C. H. CLARK.
SHAFT COUPLING.
APPLICATION FILED DEC. 4, 1918.

1,337,642. Patented Apr. 20, 1920.

FIG 1.

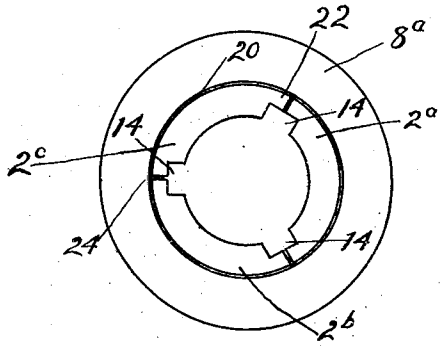


FIG 2.

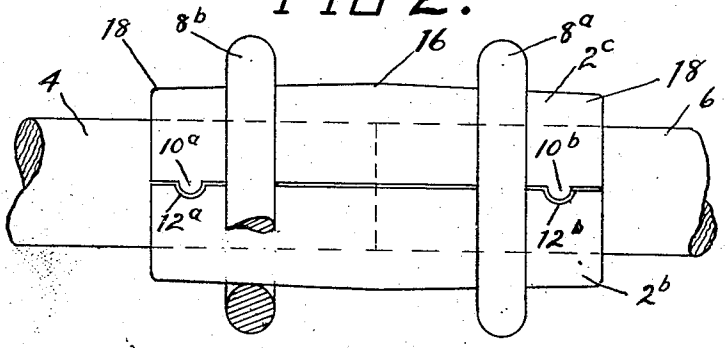


FIG 3.

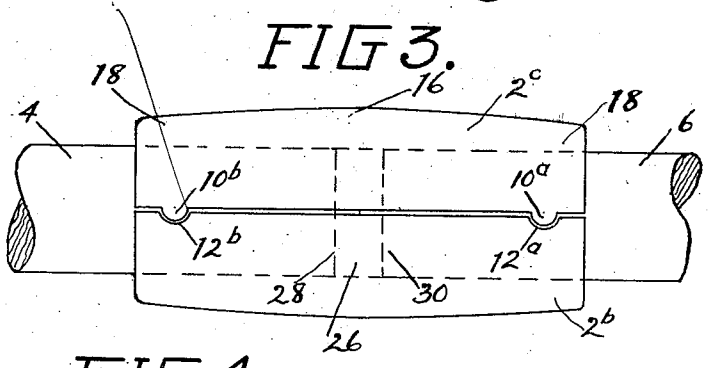
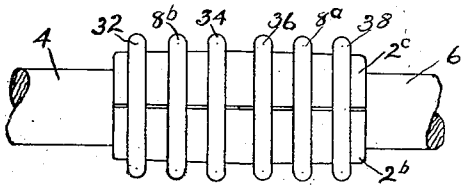


FIG 4.



INVENTOR
Charles Haskell Clark.

UNITED STATES PATENT OFFICE.

CHARLES HASKELL CLARK, OF NEW YORK, N. Y.

SHAFT-COUPLING.

1,337,642. Specification of Letters Patent. Patented Apr. 20, 1920.

Application filed December 4, 1918. Serial No. 265,286.

To all whom it may concern:

Be it known that I, CHARLES HASKELL CLARK, citizen of the United States, and resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Shaft-Couplings, of which the following is a specification.

This invention relates to couplings, of the compression type, for connecting line shafting.

The main object of this invention is to provide a compression coupling with a compression ring having a face, substantially convex in cross-section, engaging the members of the coupling so that the compression ring may be forced home by abrupt blows at any point of its periphery without being forced or twisted out of contact at any point with the said compression members; that is to say, a ring which will have substantially a bearing edge as an engaging face, instead of a wide tapering face, which edge may be hammered out of peripheral alinement while still engaging the compression members snugly at all points.

Another object is to provide a ring in which the stroke applied may be localized, so that the resistance to a blow at a particular point will be minimized, the portions of the ring being forced forward successively as they are struck with a hammer.

A further object is to so form the ring that it will have a line surface contact with the compression members so that when the ring is hammered up by successive hammer blows at different points it will snugly engage the compression members at all peripheral points of the ring notwithstanding such peripheral misalinement as may be incident to such hammering; and to so form and combine the compression members and ring that when the ring is hammered up so that the coupling is tight the compression is so great it depresses the metal of the compression members, locking the ring in this position, involving abrasion of the metal of all elements of the coupling in hammering the ring off to separate the coupling.

One way of accomplishing the above result is to make the ring of steel with its engaging face of convex form in cross section and to make the compression members of cast iron with a taper of approximately $\frac{1}{4}$ of an inch to the foot.

A further object is to form a relatively short coupling unit in which the rings may be positioned on the compression members by hand before being hammered home, this being accomplished by increasing the angle of the taper at the end portions of each compression member.

To this and other ends the invention consists in the novel features of construction and combination of elements hereinafter described:

Figure 1 shows an end view of the coupling,

Fig. 2 shows a side view of the coupling, one of the compression rings 8^b being broken away and shown in cross-section;

Fig. 3 shows a side view of a modified form of the coupling, having a gradually decreasing taper toward the center. In this figure the compression rings are removed; and

Fig. 4 shows a side view of the coupling with several compression rings forced onto the housing.

The coupling in Figs. 1, 2, 3, and 4 is composed of three shaft housings, 2^A, 2^B, and 2^C, mounted upon and coupling together shafts 4 and 6. Compression rings 8^A and 8^B are adapted to be forced over the end portions of the housings 2^A, 2^B, and 2^C, and clench the housing tightly against the shafting, so that the shaft ends will be forced into perfect alinement with each other and transmit power one from the other.

Housing 2^C is provided with two projections 10^A and 10^B on one of its edges, which register with grooves 12^A and 12^B on housing 2^B.

Housings 2^A and 2^B also have similar projections fitting into grooves in housings 2^A and 2^C respectively, thus keeping the housings in perfect register with each other when being assembled on the shaft; all of the housings have a portion cut away at 14, in order to reduce the weight and also serve as a keyway if desired.

Fig. 4 shows a coupling having additional

compression rings 32, 34, 36, and 38 which greatly increase the amount of compression against the shafting, adapting it for use on large size shafting.

The housings are all tapered on both ends so that the outside diameter of the housings, when assembled on the shaft is greater at the center 16 than at the ends 18.

To attach the coupling to the shafts 4 and 6 the housings 2^A, 2^B, and 2^C are placed around the shafting, and the two compression rings 8^A and 8^B are slipped over the ends of the assembled housings; a hammer is then used to drive rings 8^A and 8^B toward the center 16, which is greater in diameter than the ends 18, thus causing the compression rings to clench the housings firmly against the shafting, so that the coupling and shafting become as one solid joint firmly connecting the two shafts together in perfect alinement; whereas the sleeve used in other compression couplings will bend under a side strain and throw the shafting out of alinement.

In Fig. 3 the two shafts 4 and 6 have a space 26 left between their two ends 28 and 30, so that the compression rings may be placed on the shafting and the coupling installed without moving the shafting longitudinally.

I prefer to divide the shaft housings into three equal sections, 2^A, 2^B and 2^C, in order to get the maximum compression; I do not, however, confine myself to the use of three housings, for the housing may be made of one sleeve, like those now being used in standard couplings, or it may be made into two parts or several parts. Space may be left between the housings to allow for a limited degree of housing adjustment if it is desired to use the coupling on slightly larger or smaller shafting. With large size shafting, where the housing is subjected to extra heavy strain, it is preferable to have the straight taper shown in Fig. 2 and Fig. 4, in order to accommodate the additional rings which I use to increase the compression on the shafting and to strengthen the housing.

I prefer to construct the outer surface of the housings so as to form a perfect circle, but the surface may be altered so as to cause the rings to bear more heavily against the central part at 20 than at the two edges 22 and 24 in Fig. 1, and thus lessen the amount of force necessary to drive the rings on to the housings.

The housing members 2^A, 2^B and 2^C, where but two compression rings are used, are very short and, in order to facilitate the quick and easy positioning of the rings on the housing members, it is desirable that they may be slipped on by hand a little way and that thereafter they will take hold without having to travel a great distance on the housing members, and to this end I form each end portion of each housing member with a relatively sharp taper, this running into a taper at a less degree, so as to get speed in placing and efficiency in compressing action. It is desirable to so proportion the parts, taper and materials that the ring will actually depress part of the faces of said housing members, seating itself in such depression and necessitating abrasion between the parts in order to get the ring off, an illustrative arrangement being mentioned above.

I prefer to make the compression rings of round steel, bent into a circle and welded, but they may be made of any suitable material and may be cast. The engaging surface of the rings is convex in cross section for the purpose of obtaining a line surface contact or substantially edge-like contact with the compression members, so as to decrease the force necessary to drive them on, and means other than a hammer may be employed for this purpose, such as a clamp for drawing them together, or a crowbar for wedging them into position, provided the surface of the housing be suitably constructed to receive the point of the crowbar for this purpose. Bushings may be used on the shafts to increase the diameter of the housing should the rings fit too loosely or should it be desired to connect two shafts of different diameters.

Having described my invention, I claim—

1. A coupling comprising a tapered member mounted upon shafts to be coupled, in combination with a ring encircling said tapered member, adapted to firmly engage and force said tapered member against said shafts for the purpose set forth, said ring having its face engaging said tapered member of convex form in cross-section.

2. A power transmission device comprising a tapered member adapted to be mounted upon a shaft, in combination with a compression member encircling said tapered member and adapted to firmly engage and force said tapered member against said shaft, said compression member having a surface which makes merely a line contact with the tapered member in any position thereon.

3. A power transmission device comprising tapered compression members adapted to be engaged over adjoining ends of a pair of shafts to be coupled, in combination with annular members for compressing the coupling members upon said shafts, each annular member having a line surface contact with the compression members.

4. A power transmission device comprising a tapered compression coupling member adapted to be engaged over adjoining

ends of a pair of shafts to be coupled, in combination with annular members for compressing the coupling member upon said shafts, each annular member having a line surface contact with the compression members.

Signed at New York city, in the county of New York and State of New York, this 30th day of November, A. D. 1918.

CHARLES HASKELL CLARK.

Witnesses:
CHAS. HEIZENBERG,
JULIA D. CLARK.