

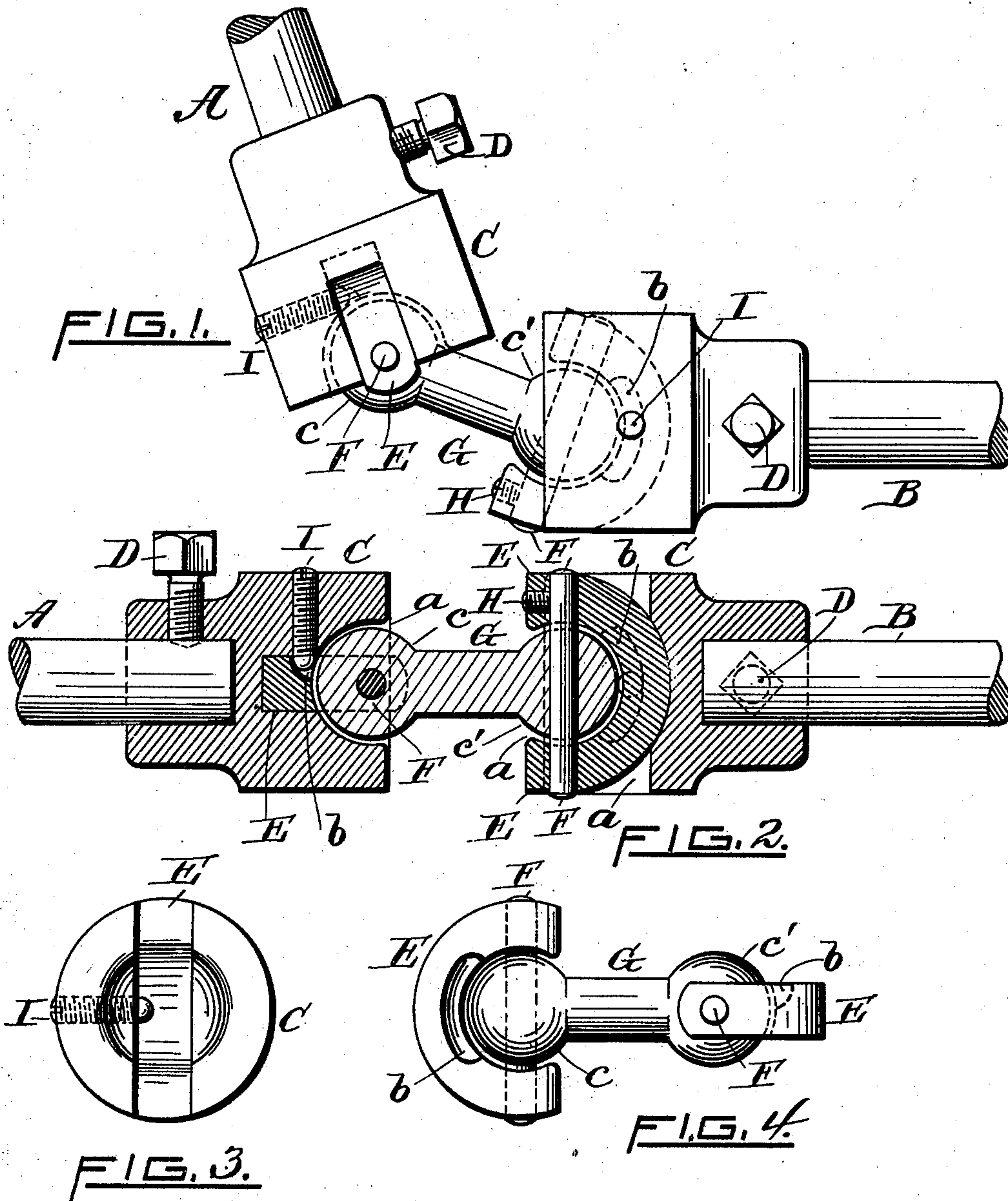
No. 686,027.

Patented Nov. 5, 1901.

T. E. CARPENTER.
ANGULAR SHAFT COUPLING.

(Application filed Mar. 18, 1901.)

(No Model.)



WITNESSES.

INVENTOR.

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UNITED STATES PATENT OFFICE.

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ANGULAR SHAFT-COUPLING.

SPECIFICATION forming part of Letters Patent No. 686,027, dated November 5, 1901.

Application filed March 18, 1901. Serial No. 51,701. (No model.)

To all whom it may concern:

Be it known that I, THOMAS E. CARPENTER, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Angular Shaft-Couplings, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a side elevation of two sections of shafting set at an angle with each other and connected by my improved coupling device. Fig. 2 is a side elevation of said shaft and a central longitudinal section of the two couplers or shells in combination with the coupling-bar. Fig. 3 is a front elevation of one of the couplers or shells. Fig. 4 is a side elevation of the coupling-bar and the semi-circular oscillating yokes with which the ball ends of said bar, respectively, are pivotally connected.

My invention relates to angular shaft-couplings; and it consists of the novel construction and combination of the several elements, as hereinafter particularly described, and specifically set forth in the claims.

Like letters indicate like parts.

In the drawings, A B represent two shafts which are to be coupled. They are mounted in proper supports and may be either offset or at an angle with each other. Said shafts are held from longitudinal or endwise movement in any suitable manner. On the end of each shaft is fitted a coupler head or shell C, substantially cylindrical in its surface and having a concentric socket into which the end of the shaft is inserted, as seen in Figs. 1 and 2. The coupler head or shell is tapped through one side for the insertion of a set-screw D, whose inner end bears against the shaft within the socket, as shown. At the opposite (outer) end of the coupler C it is transversely grooved, as seen at *a* in Fig. 2. An arc-shaped yoke E (somewhat exceeding a half-circle in extent) is provided with an arc-shaped concentric groove *b*, Figs. 2 and 4, and with a diametrical bore near its ends adapted to receive a pin F. The coupling-bar G has ball-shaped ends *c c'*, which are diametrically bored at a right angle with the axial line of the bar to receive the pins F, re-

spectively, the bore of the ball end *c* being at a right angle to the bore of the ball end *c'*, as shown. A set-screw H, passing through a hole tapped in the end of the yoke E, has the inner end thereof in contact with the pin F, which pin, as seen in the drawings, passes through the yoke E and passes loosely through the adjacent ball of the coupling-bar G, (see Fig. 2,) and a set-screw I, passing through a hole tapped in one side of the shell C, has its inner end enter into the groove *b* of the yoke E. When these parts are made and assembled as shown and one of the shafts A or B is rotated by power, said power is communicated to the other of said shafts without loss by means of said coupling device. The coupling-bar G has an oscillating movement on the pins F within the yokes E, and each yoke E has a vibrating curvilinear movement alternately back and forth upon the set-screw I, which enters the groove *b* of the yoke E, the curvature of said groove and the projection of the set-screw I therein permitting such sliding movement of the yoke E.

My improved angular coupling device accomplishes the same result as do bevel-gears, and whereas bevel-gears must have their engaging gear-surfaces exactly fitted and adapted to the particular angle at which the shafts are mounted relatively to each other and cannot operate if the shafts are at any other angle my said coupling device is adapted to rotate shafts set at ninety degrees or at any other less angle with each other without any change or adaptation.

By inspection of Fig. 1 it will be seen that the yokes E are almost entirely within the grooves *a* of the coupler heads or shells C, as they vibrate therein, and hence afford an extensive flat surface on both their sides to receive and transmit the power of the rotating shaft with the most effective leverage possible in the space provided. The pins F, whereon the balls *c c'* of the coupling-bar G swivel, are so arranged and disposed as to receive and transmit said power without loss or friction.

Instead of having an arc-shaped groove *b* in the yoke E, with the set-screw I entering therein, an arc-shaped slot may be made in said yoke, and a pin extending through the

ends of the yoke in such construction would pass loosely through said slot. Such a modification would, however, be the same in principle and would be within the scope of my invention.

I claim as a novel and useful invention and desire to secure by Letters Patent—

1. The angular shaft-coupling herein described, consisting of the combination with two shafts at the adjacent ends thereof, of two couplers or shells mounted and fastened on said shaft ends, respectively, and each having in its outer end a transverse groove, a coupling-bar having two spherically-formed ends which are diametrically bored at a right angle with each other and with the axial line of said bar, two arc-shaped yokes, each having a short concentric groove on one side thereof and mounted slidably in said groove of its companion coupler or shell, a pin passing through the ends of each of said yokes and through the adjacent ball end of the coupling-bar therein, and a set-screw passing through one side of each coupler or shell and

entering the said groove of the companion yoke, substantially as specified.

2. In shaft-couplings adapted to connect the ends of two rotating shafts which are mounted at an angle to each other, the combination of said two shafts, a coupling-bar, a coupler head or shell secured on the end of each shaft and each having a diametrical groove, a yoke in each coupler or shell adapted to receive the adjacent end of said coupling-bar and mounted in the groove of said coupler or shell and capable of a vibratory curvilinear movement in said groove, a pin loosely connecting the ends of each yoke with the adjacent end of the coupling-bar therein and means arranged to confine said yokes, respectively, to a limited curvilinear movement, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS E. CARPENTER.

Witnesses:

WARREN R. PERCE,
JOSEPH R. BULLOCK, Jr.