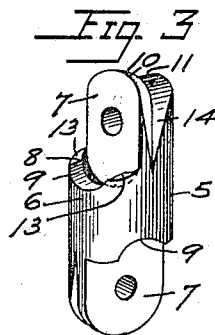
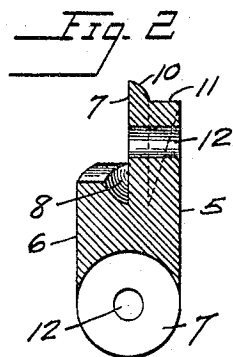
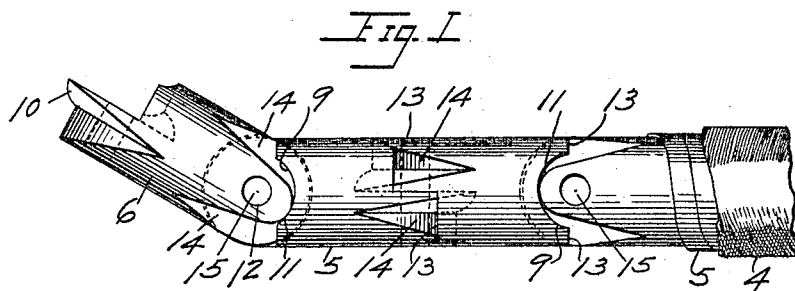


No. 839,469.

PATENTED DEC. 25, 1906.

G. H. GILLETTE.
FLEXIBLE SHAFT.

APPLICATION FILED MAY 17, 1906.



Witnesses
E. H. Berthoff
Harvey H. Herche

Inventor
George H. Gillette.
By his Attorney
Harry P. Van Wye

UNITED STATES PATENT OFFICE.

GEORGE H. GILLETTE, OF NEW YORK, N. Y.

FLEXIBLE SHAFT.

No. 839,469.

Specification of Letters Patent.

Patented Dec. 25, 1906.

Application filed May 17, 1906. Serial No. 317,340.

To all whom it may concern:

Be it known that I, GEORGE H. GILLETTE, a citizen of the United States, residing at New York, in the county and State of New York, have invented a new and useful Flexible Shaft, of which the following is a specification.

This invention relates to flexible shafts used in connection with machinery, and is designed as a companion invention to that shown in my application filed May 4, 1906, Serial No. 315,226.

The object of my present invention is to provide a shaft that will be flexible and positive in use and that will not kink or get twisted under any conditions.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a portion of a flexible shaft constructed according to my invention, a portion of the casing being removed to show the construction of the links. Fig. 2 is a longitudinal section of one of the links, and Fig. 3 is a perspective view of one of the links.

In the accompanying drawings, like numerals of reference refer to the same parts in each of the views, and in practice I provide a flexible shaft consisting of the ordinary casing 4, in which is mounted the shaft proper, consisting of a plurality of links 5, each of which has a body 6, preferably cylindrical in form, and the ends cut away to form a connection with the preceding and succeeding links, the cut-away portion at one end being at right angles to the cut-away portion at the other end.

Each end has one side cut away to form a face 7, equal in width to the diameter of the body of the link, the face 7 being taken on the diameter of the body of the link, and the faces on the opposite ends being at right angles. At the base of each face is formed a recess or pocket 8, and in the wall surrounding this pocket is formed a curved or recessed end 9. The opposite side of each end is cut away to form a beveled projection 10, adapted to work freely in the pocket 8 of the next link, and adjacent to this beveled end the metal is cut away to form a curved end 11, which is on a radius with the center of the rivet-hole 12, to form a bearing against the curved end wall 9 of the next link. The balance of the wall surrounding the pocket 8 has flat ends 13, and the metal adjacent to the curved end 11 is cut away, as shown at 14, so that the links are free to swing on the connecting-rivet

15, through a considerable arc, depending on the amount of metal cut away at 14, as will be understood. The link at the left of Fig. 1 illustrates the swing of the links on the connecting-rivet.

In operation the links are riveted together and are free to swing on the rivets through certain limits, as already described, and as the faces 7 are at right angles on the opposite ends two of the links will swing in one direction at one end, while the movement with the next links will be at right angles, so that, as here shown, the shaft will be flexible in two directions, which for all practical purposes is all the flexibility required, although it is evident that the faces 7 on the opposite ends of the links might be at any angle with reference to each other and the links put together in successive series, so as to give the shaft any desired movement. As the links are short, however, the shaft will have great flexibility, and the fact that the links move only in two directions will not be evident to the user.

Owing to the construction here shown, as the beveled end 10 fits snugly within the pocket 8 very little strain is placed upon the rivet 15 in driving; as the faces 7 of the connecting-links bear against each other, and the beveled end and pocket serve as a brace to keep the faces in contact and to assist in the driving.

It will thus be seen that I have formed a very simple and efficient flexible shaft and one that is positive in driving without danger of kinking or getting twisted in use.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A flexible shaft having a plurality of links each of which is provided with a cut-away end to form a face, and a recess at the base of the face, the opposite side being beveled, adapted to engage a corresponding recess in the next link, and means to secure the links together.

2. A flexible shaft having a plurality of links each of which is cut away at the end to form a face, and a recess at the base thereof, said link being cylindrical in form, and said face being on a diameter of the cylinder, the opposite side of each end being cut away to form a beveled portion corresponding to said recess, for the purpose set forth.

3. A flexible shaft having a plurality of links, each of which is cylindrical in form,

and having each end thereof cut away to form a face on a diameter of the cylinder, the faces at the opposite ends being at right angles, said links being provided with recesses adjacent to said faces, and beveled portions adapted to engage the recesses of the next links, and means to hold the links together, for the purpose set forth.

4. In a flexible shaft, a link cylindrical in form having the ends thereof cut away to form faces on different diameters thereof, and a recess formed at the base of each face, the opposite side of each end being formed into a beveled portion, a rounded end, and a cut-away portion adjacent to said rounded end, as and for the purpose set forth.

5. In a flexible shaft, a link cylindrical in form having the ends thereof cut away to form faces, the faces at the opposite ends being at right angles, said ends being cut away to form a recess at the base of each face, a depression in the wall surrounding said recess, a beveled projection proportioned in size to said recess, a curved end adjacent to said beveled portion, and cut-away portions adjacent to said curved ends, as and for the purpose set forth.

6. A flexible shaft comprising a casing and a shaft comprising a plurality of links joined

together, mounted therein, said links being faced at the ends longitudinally, and having recessed, and beveled portions adapted to engage and operate in each other whereby the faces of the adjacent links are held in contact, and means to secure the links together, as and for the purpose set forth.

7. The herein-described flexible shaft comprising a casing and a shaft mounted therein, comprising a plurality of links each of which is cut away longitudinally to form a face at each end, the faces on the opposite ends being at right angles, each end being provided with a recess adjacent to the face, a cavity, or depression in the wall surrounding the recess, a beveled end back of the face proportioned to said recess, a curved end adapted to bear against said depression, and a cut-away portion on each side of said curved end, and rivets securing the links together, as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE H. GILLETTE.

Witnesses:

HAROLD LETH,
CHAS. H. WHITE.