

No. 687,864.

Patented Dec. 3, 1901.

S. F. SMYTH.
SHAFT COUPLING.

(Application filed June 13, 1901.)

(No Model.)

Fig. 1.

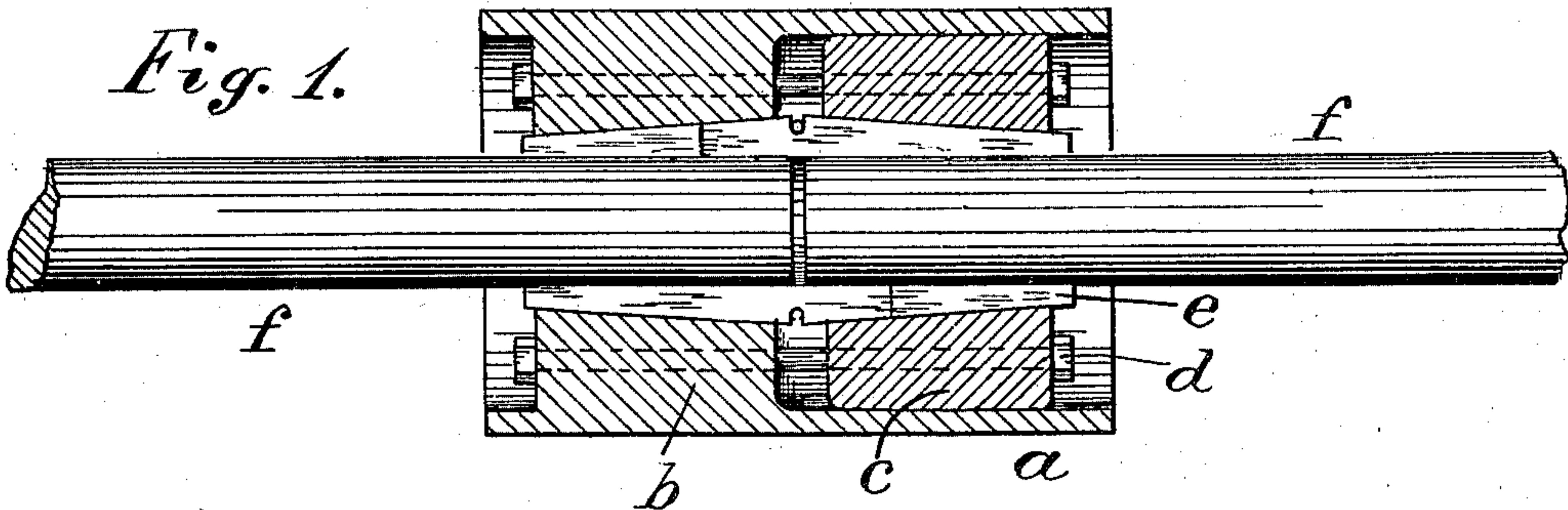


Fig. 2.

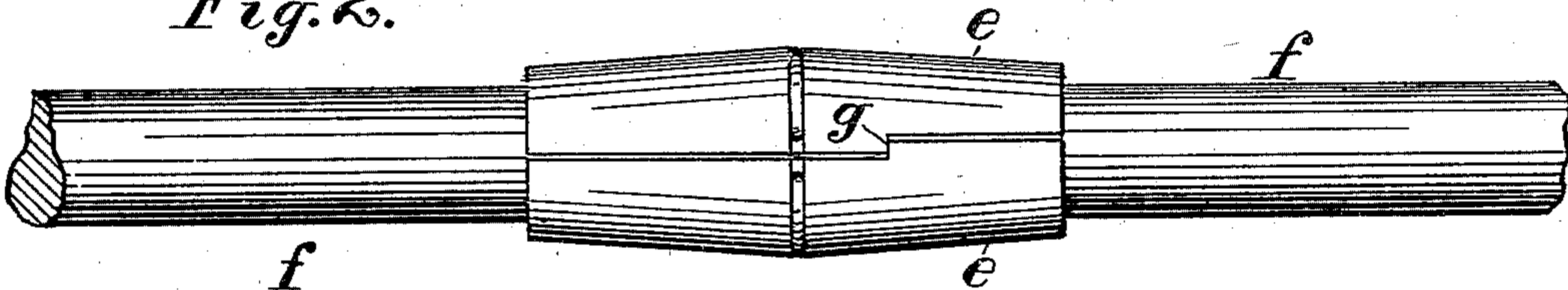


Fig. 3.

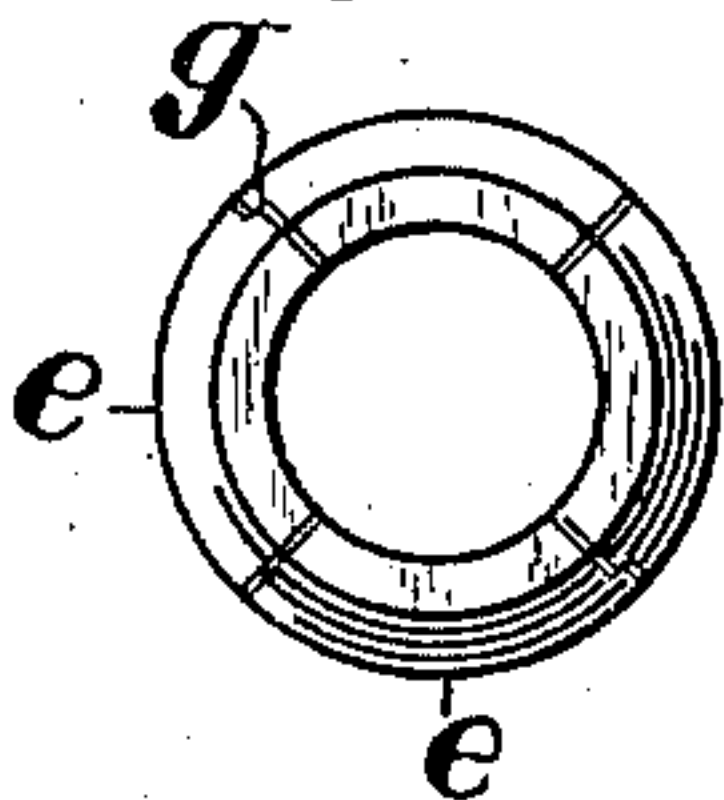


Fig. 4.

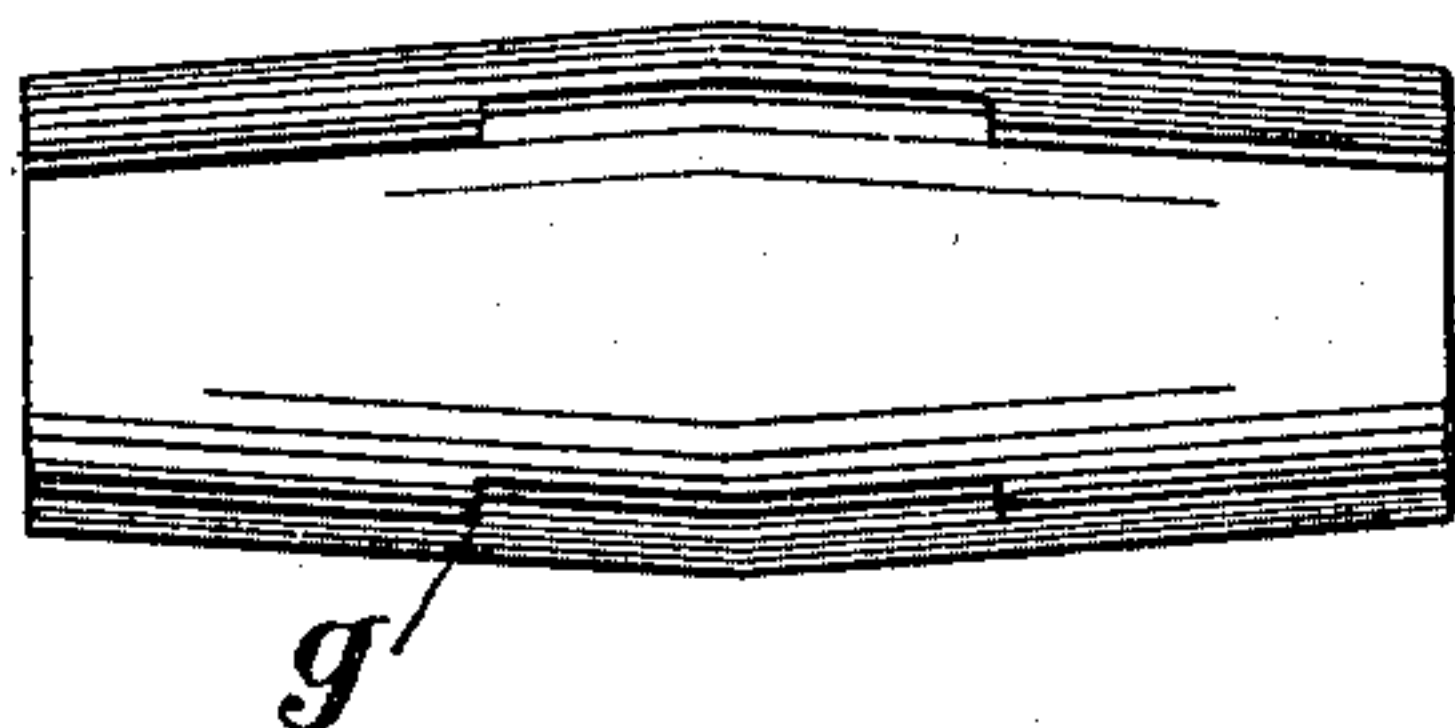


Fig. 5.

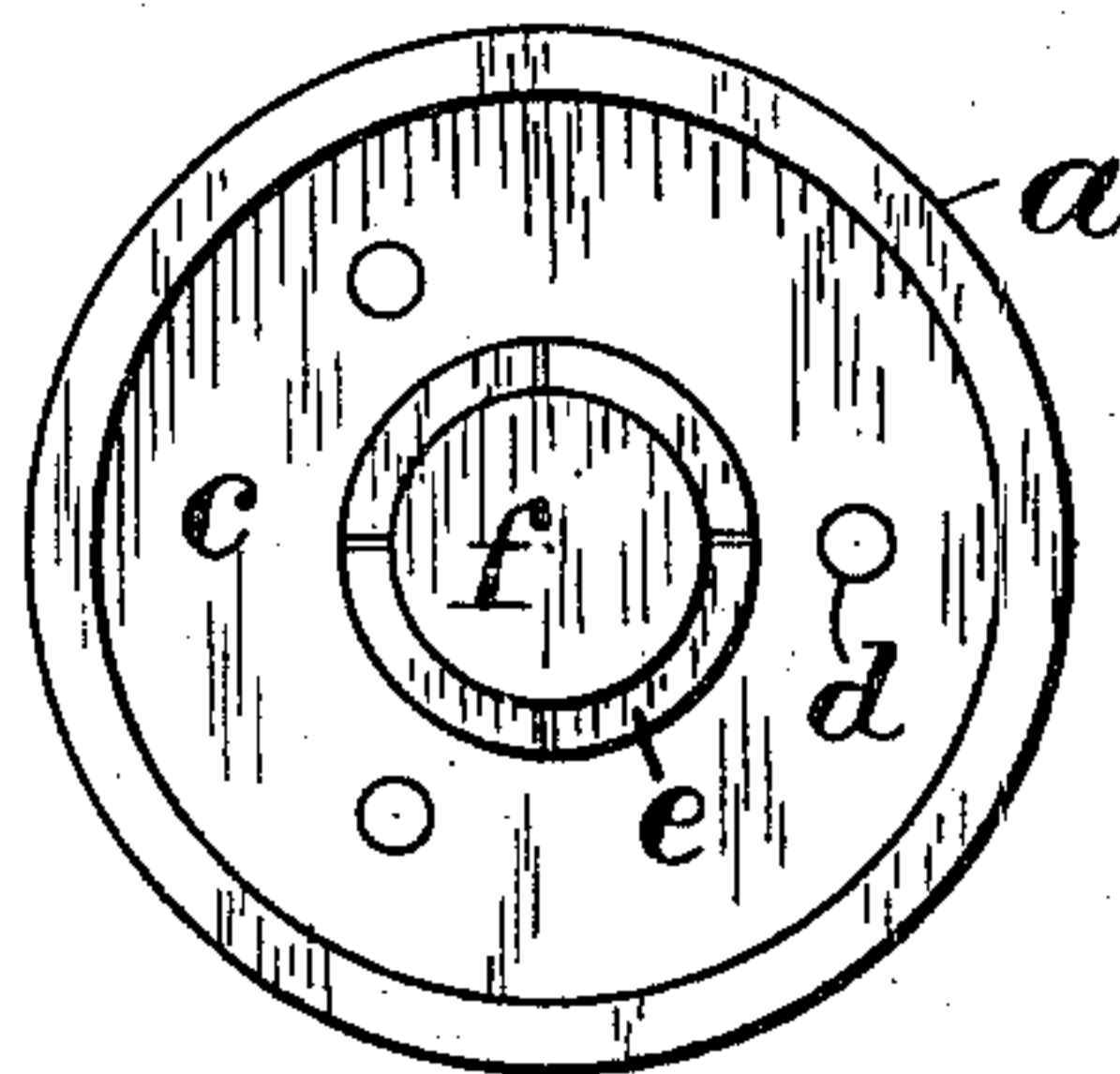


Fig. 6.

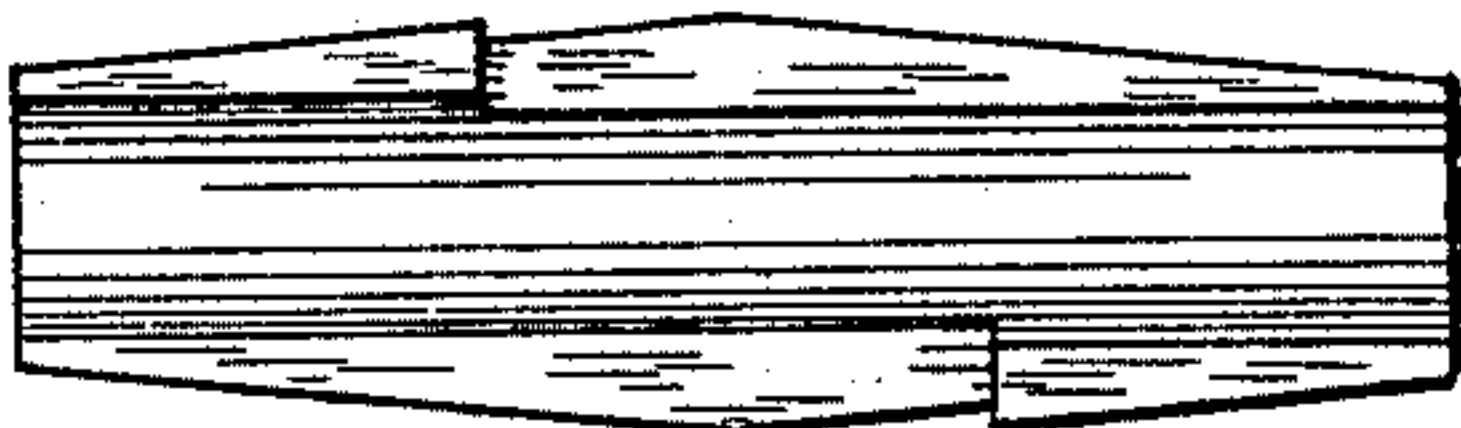


Fig. 7.

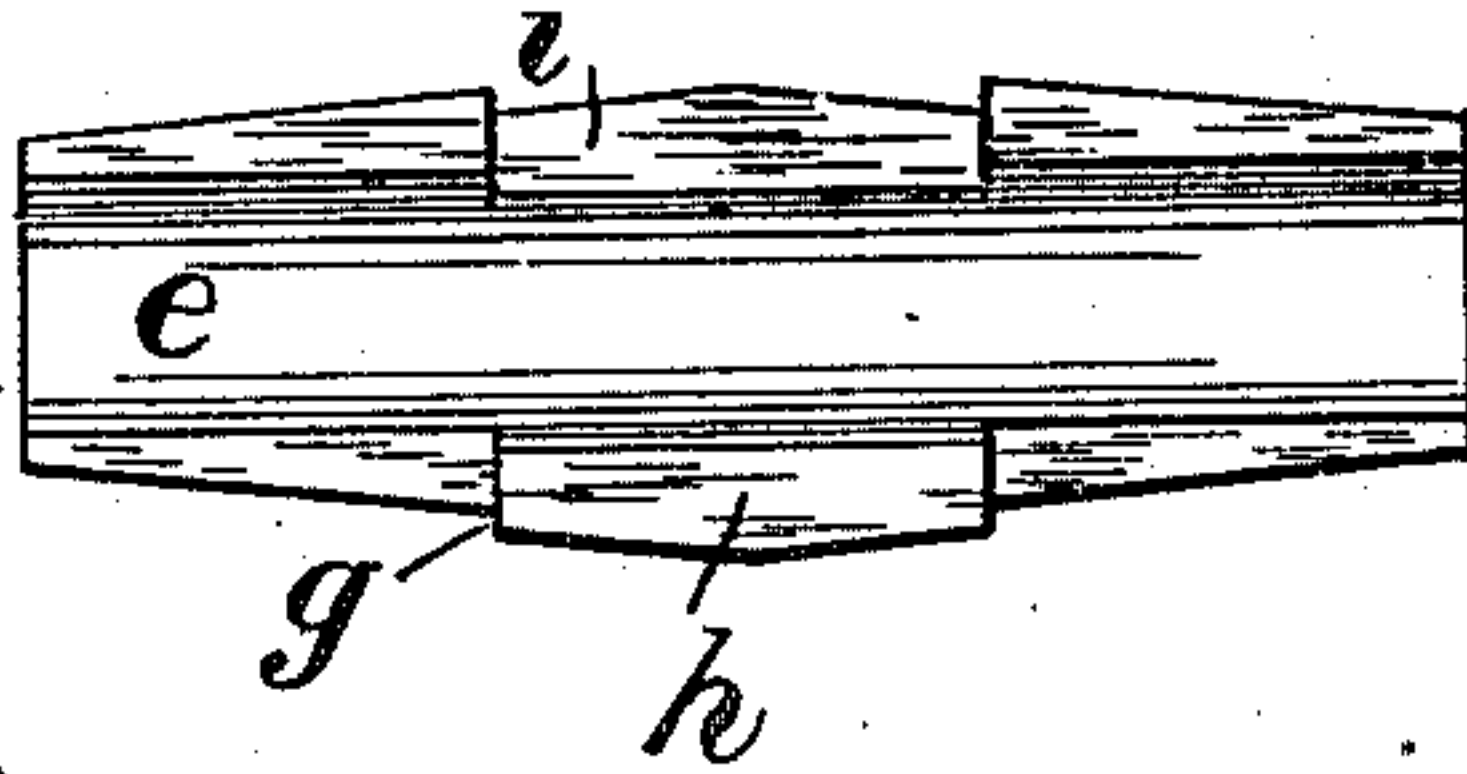
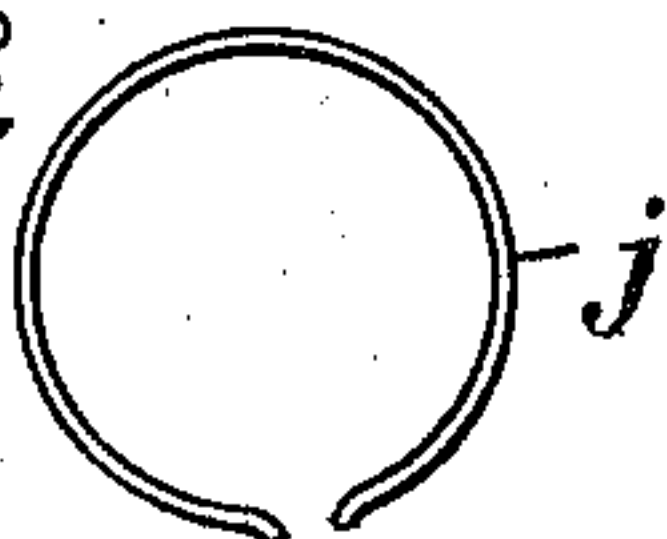


Fig. 8.



Attest:

Corrigan & Smith
Notary Public

Inventor.

Samuel F. Smyth
per Theo. S. Crane, Atty

UNITED STATES PATENT OFFICE.

SAMUEL F. SMYTH, OF BROOKLYN, NEW YORK.

SHAFT-COUPLING.

SPECIFICATION forming part of Letters Patent No. 687,864, dated December 3, 1901.

Application filed June 13, 1901. Serial No. 64,375. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL F. SMYTH, a citizen of the United States, residing at 241 Steuben street, Brooklyn, Kings county, State of New York, have invented certain new and useful Improvements in Shaft-Couplings, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The present invention relates to that class of shaft-couplings in which a divided double cone is clamped upon the adjacent ends of the shaft by means of collars movable endwise over the cones. Heretofore the double cone has sometimes been made in halves, in which case the clamping pressure only operates upon two opposite sides of the shaft and does not grip it firmly, as is required, and in such couplings it is common to fit a key to the shaft and to the double cone to prevent the shaft from slipping within the cone. In other cases the double cone has not been divided at all, but has been slit radially for a portion of its length upon two different diameters, thus adapting the parts to yield more or less in four directions. In other constructions where a plain double cone has not been used the coupling-sections have been provided with tapering grooves and other means for pressing them together; but the plain double cone with plain conical collars to clamp and compress the same is the cheapest construction, and my invention relates to such a double cone. In the present invention I divide the double cone longitudinally into more than two distinct sections, which are entirely free to contract or expand at either end, so as to firmly grip the opposed ends of the shaft. Such loose sections, are difficult to hold in place while applying them to the shaft and are liable to slip endwise when fitting the collars thereto, so that a portion only of the sections is liable to bear all the clamping strain, and thus prevent the normal operation of the coupling. To avoid such difficulty in the use of three or more loose sections and to hold the sections coincident while fitting the collars thereto, I provide the several sections of the double cone with one or more offsets upon their adjacent edges, the shoulder formed by the offset upon each section interlocking or engaging with a corresponding

shoulder upon the adjacent section. Such offsets are at right angles to the edges of the sections and prevent the longitudinal displacement of the several sections and enable them to resist as a whole the longitudinal thrust of the coupling-collars, which necessarily produce great friction upon the sections by their heavy clamping pressure. To hold the loose sections upon the shaft while applying the coupling-collars thereto, an annular groove may be formed in the exterior of the sections and an elastic band fitted to such groove to hold them in place. The band being sunken below the surface of the sections does not interfere in any way with the operation of the clamping-collars. Several arrangements of the shoulders upon the sections are shown in the annexed drawings, in which—

Figure 1 is a view of a coupling divided lengthwise with the shaft ends fitted inside the double cone. Fig. 2 is a view of the shaft ends with the double-cone sections applied thereto and held thereon by an annular spring. Fig. 3 is an end view of the double cone formed in four sections with a single offset upon each section, the sections in Figs. 1 and 2 being similarly formed. Fig. 4 is a side view of the double cone in which the sections are formed with two offsets upon each of their edges. Fig. 5 is an end view of the coupling. Fig. 6 is an inside view of one of the double-cone sections with a single offset upon each edge, as shown in Figs. 1, 2, and 3. Fig. 7 is an inside view of one of the double-cone sections with two offsets upon each edge, as shown in Fig. 4, and Fig. 8 shows a spring-band.

a designates the shell of the coupling, having one of the clamping-collars *b* formed inside of the same. The other collar *c* is movable within the shell and drawn toward the collar *b* by bolts *d*.

The double-cone sections *e* are shown in Fig. 2 applied to the shaft ends *f* and formed each with a single offset, which produces a lateral shoulder *g*. Such shoulder obviously prevents the longitudinal slipping of either section in one direction, and the reverse shoulder upon the opposite edge of each section, as shown in Fig. 6, prevents longitudinal slipping in the opposite direction. When

the sections are laid upon the shaft ends, they are readily adjusted with their ends coincident, as shown in Figs. 1, 2, and 4, the shoulders serving to set them instantly in the right relation and holding them in position while the collars *b* and *c* are applied. The shoulders thereafter resist any displacement of the sections while the collars are being drawn together by the bolts *d*, and each of the double-cone sections thus receives an equal pressure from the collars. As the collars can move independently of one another, the collar at one end may operate to compress the sections more than at the other end, so as to grip the shaft end firmly which lies within such portion of the sections, whether the shaft ends be identical in size or not.

Fig. 4 shows each section formed with reverse shoulders upon both edges, the shoulders being indented at one edge to form a recess *h* and projected at the opposite edge to form a tongue *i*, which fits such recess.

The sections are of plain conical form at each end, expanding toward the middle, and the collars in like manner are of plain conical bore, tapering toward their outer ends, and both collars and cones are thus made in the cheapest manner. To hold the sections upon the shaft when first applied, before the collars are fitted thereto, the spring-band *j* (shown in Fig. 8) may be applied to an annular groove *k* upon the exterior of the sections, as shown in Figs. 1 and 2, such spring being made light enough to slip readily over the sections, but of sufficient strength to sustain their weight upon the shaft ends while the collars are fitted over them. My invention greatly increases the facility of applying such double-cone sections to the shaft and holding them in place

until the collars are screwed up, and the subdivision of the double cone into sections more numerous than two enables such sections to press upon many sides of the shaft and to thus grip the shaft in the most rigid manner. Experience has shown that with such a numerous-divided double cone the shaft can be sufficiently gripped without the expense of key-setting the same and the double cone.

Having thus set forth the nature of the invention, what is claimed herein is—

1. In a shaft-coupling, the combination, with an exterior shell and suitable collars having plain conical bores and means for drawing them together, of a plain double cone wholly divided into three or more sections, and the division-lines being each upon different adjacent radial planes, with such planes connected by a transverse shoulder or offset to hold the ends of the sections coincident upon a shaft.

2. In a shaft-coupling, the combination, with an exterior shell and suitable collars having plain conical bores and means for drawing them together, of a double cone wholly divided into three or more sections and the division-lines being each upon different adjacent radial planes, with such planes connected by two transverse shoulders or offsets operating to lock the sections together longitudinally and to hold their ends coincident upon the shaft.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

SAMUEL F. SMYTH.

Witnesses:

JACOB MARX,

W. H. VAN STERNBERGH.