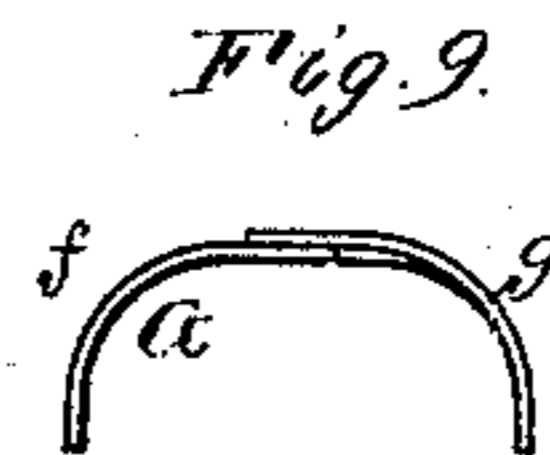
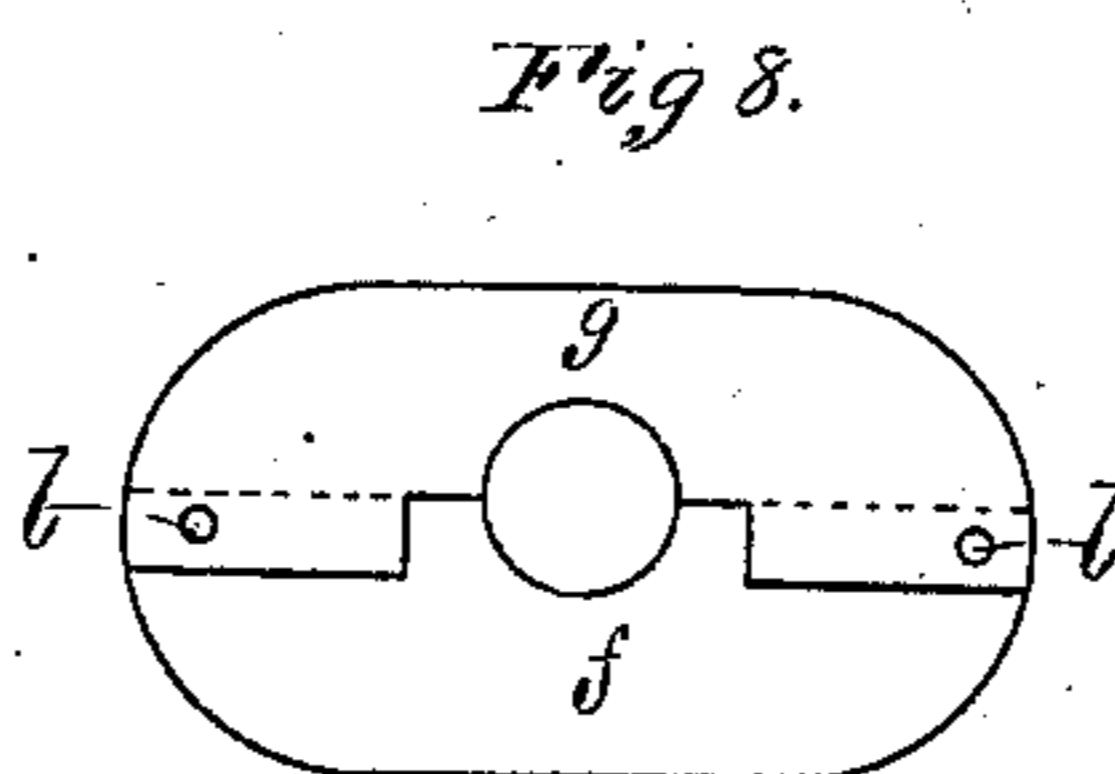
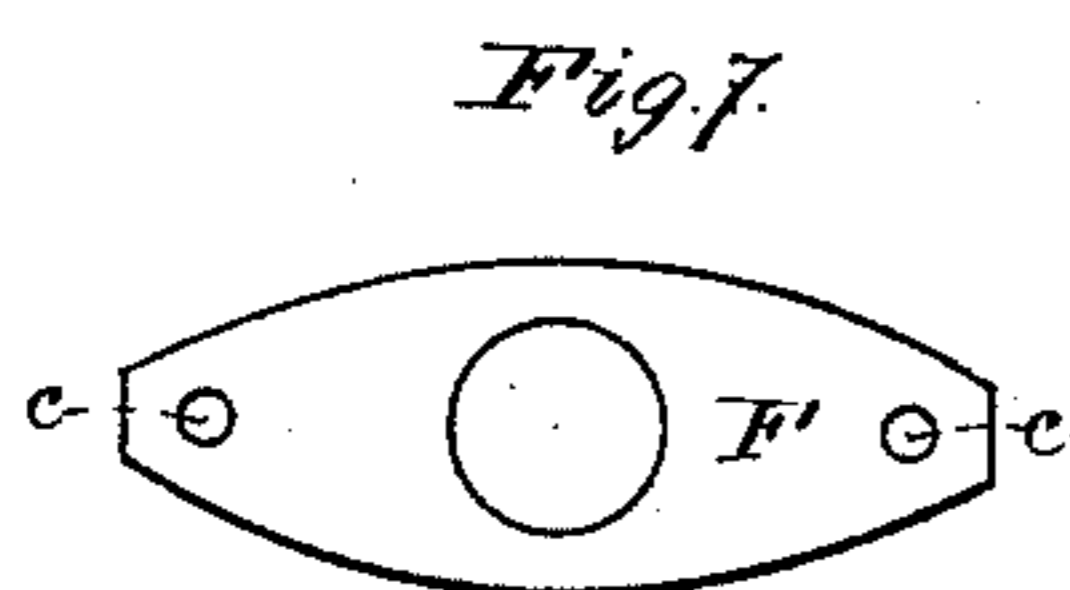
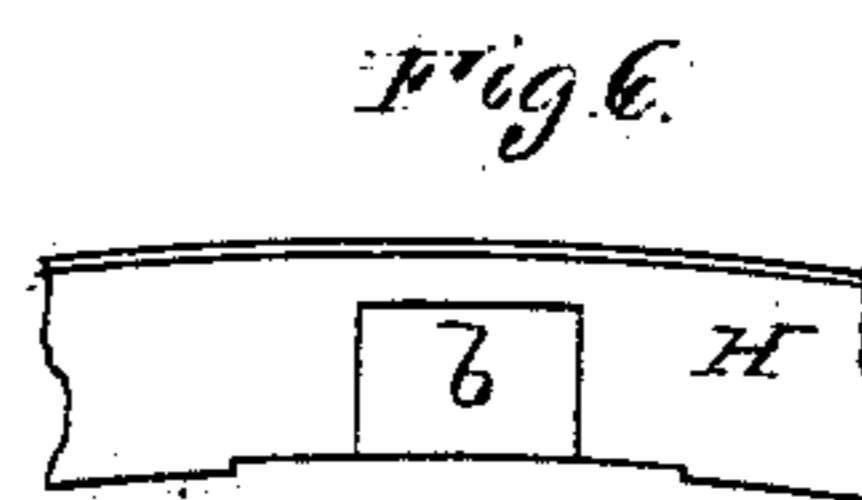
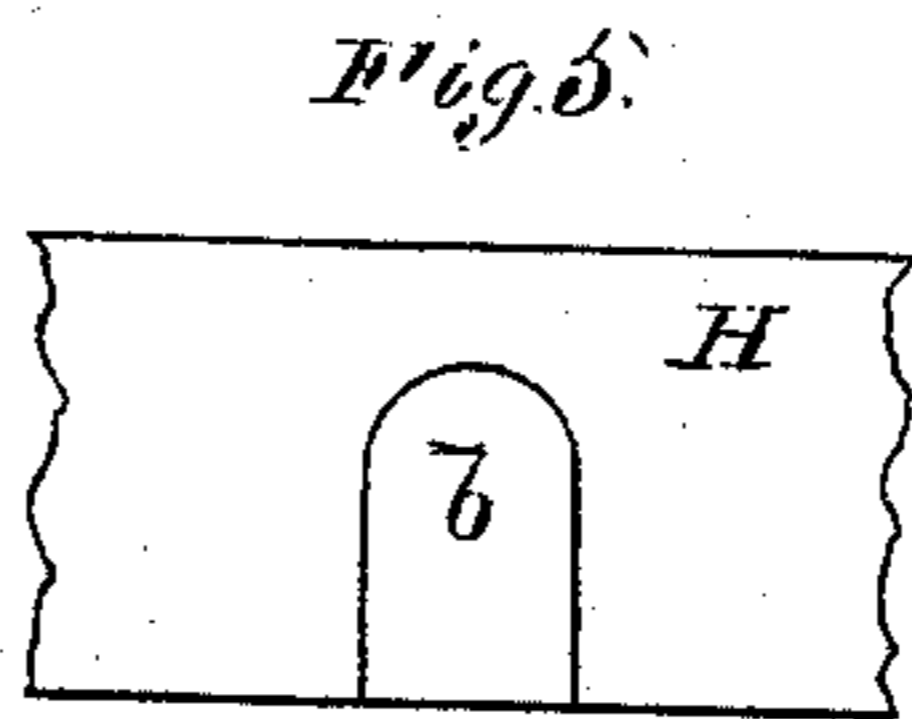
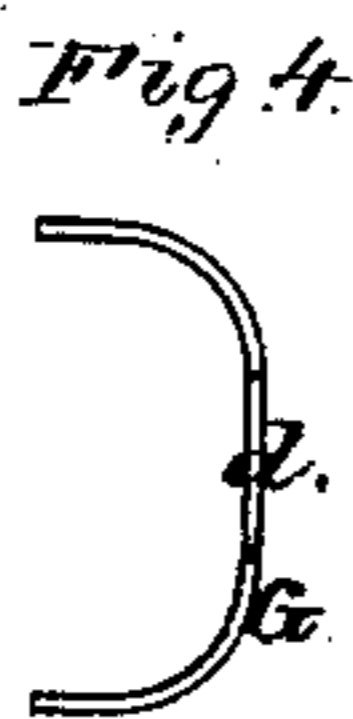
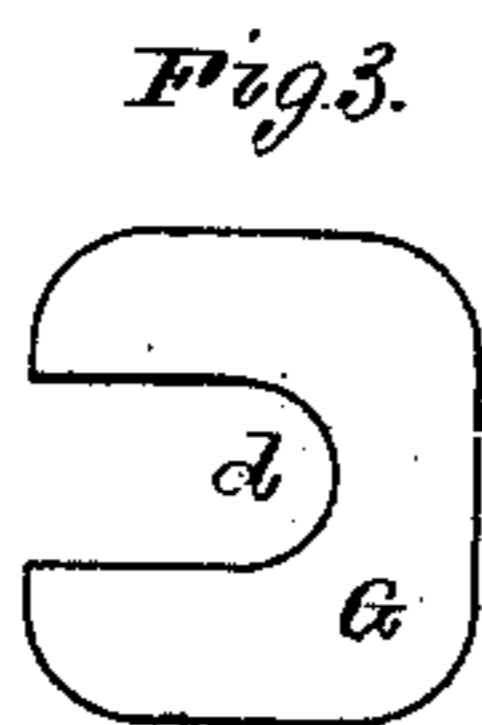
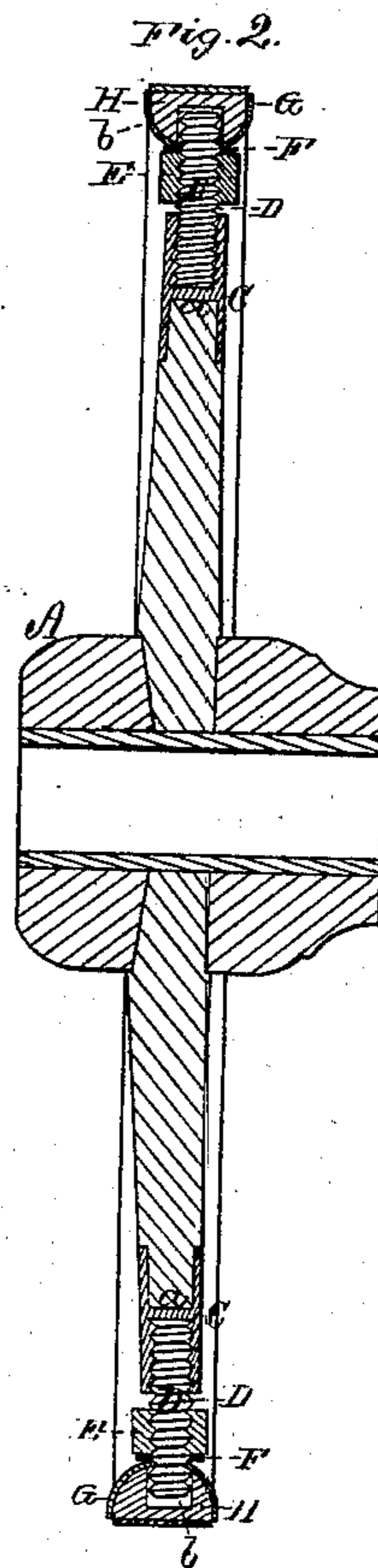
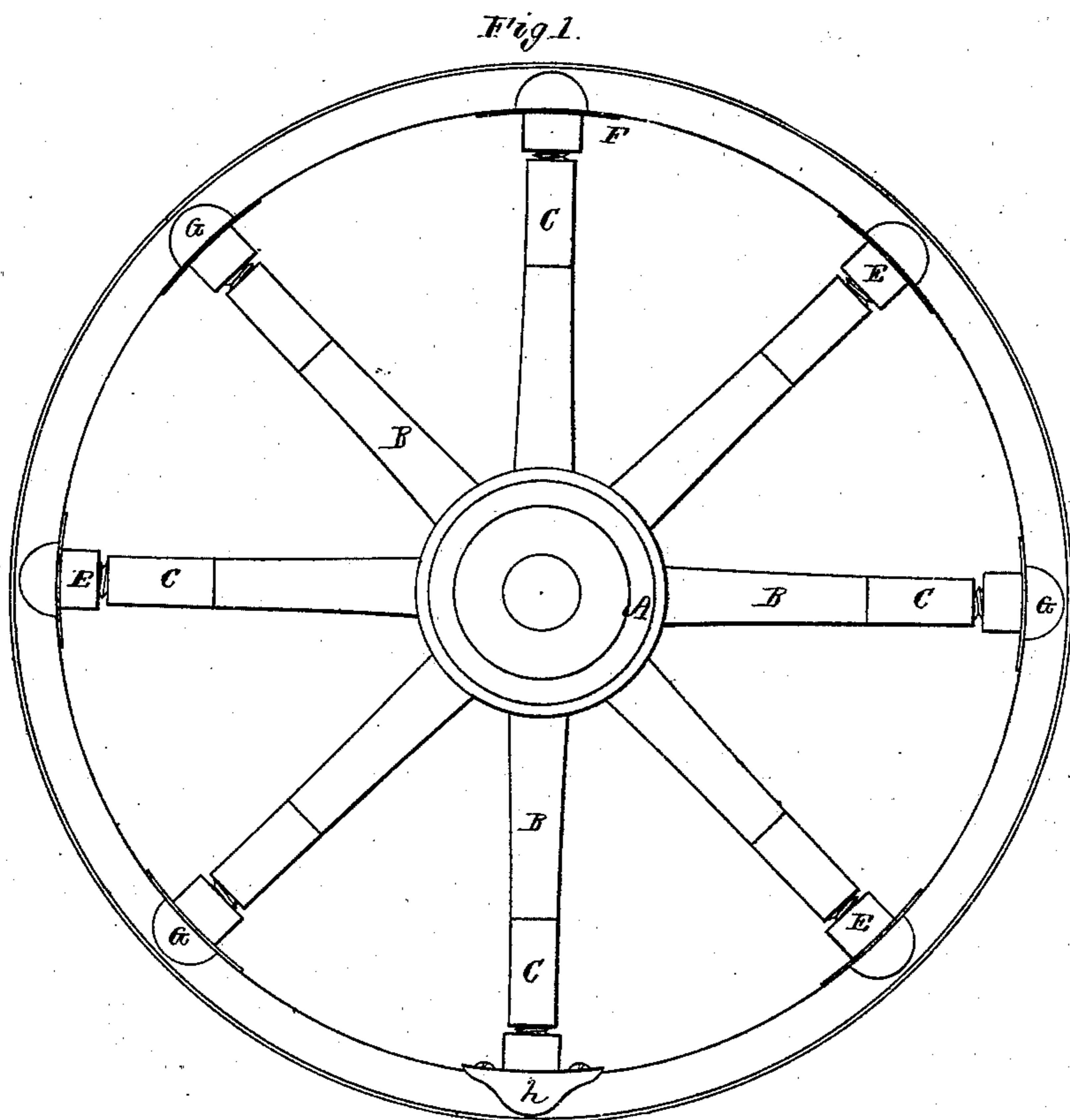


**D. CUSHMAN.**  
**Carriage-Wheels.**

No. 166,191.

Patented Aug. 3, 1875.



Witnesses.

S. W. Piper.

L. N. Höller.

Dexter Cushman.

by his attorney.

R. M. Eddy

# UNITED STATES PATENT OFFICE.

DEXTER CUSHMAN, OF MILFORD, MASSACHUSETTS.

## IMPROVEMENT IN CARRIAGE-WHEELS.

Specification forming part of Letters Patent No. **166,191**, dated August 3, 1875; application filed May 22, 1875.

*To all whom it may concern:*

Be it known that I, DEXTER CUSHMAN, of Milford, of the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Carriage-Wheels; and do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a side view, and Fig. 2 a transverse section, of a wheel having my invention. Fig. 3 is a side view, and Fig. 4 an edge view, of one of the felly-recess caps.

The object of the invention is to enable the felly to be readily separated from the spokes, or the latter set up and tightened relatively to the felly, as occasion may require.

In the drawings, A denotes the hub, and B B a series of spokes fixed therein and radiating therefrom.

On each spoke there is driven, at its outer end, a metallic ferrule, C, and up to a partition, *a*, extending across such ferrule. Into the outer end of the ferrule, and up to the partition *a*, a male screw, D, is screwed, it being projected beyond the ferrule, and provided with a nut, E, beyond which it also extends into a socket or recess, *b*, made in the felly H. This socket or recess is open on one side of the felly and closed on the other, as shown in Figs. 5 and 6, the former of which is an inner-edge view, and the latter a side view, of part of the felly having such a recess.

In advance of the nut, and on the screw, is an elongated plate or washer, F, formed as shown in side view in Fig. 7, which is to be fastened to the inner periphery of the felly by screws going through holes *c c* in said washer. Between the felly and the washer is the spanner or recess-cap G, (shown more particularly in Figs. 3 and 4,) it being notched, as represented at *d*, to enable it to be slid upon and embrace the screw; it being curved transversely to cause it to fit to the felly, cover the mouth of the recess, and aid in holding the felly and spoke-screw in connection.

By screwing the nut up against the washer the felly may be tightened with respect to the spoke, or the latter with respect to the former.

By setting back each of the nuts on its screw, removing the fastenings of the washers, and slipping back the several spanners, the felly may be readily separated from the spokes.

From the above it will be seen that in case of shrinkage of either of the spokes in the hub, or otherwise, so as to work loose, it can be easily set up or tightened.

The spanner G may be composed of two plates, *f g*, formed as shown in Figs. 8 and 9, (Fig. 8 being a top view, and Fig. 9 being an edge view, of them,) one lapping a short distance on the other, and each having holes *l l* in its lapping part, to receive the fasteningscrews by which it is to be fixed to the felly.

Some of the spokes may be without the washer, but have a spanner of common kind, as shown at *h*, curved transversely to fit to and around the felly.

I do not claim a screw, nut, and a ferrule made and applied to a wheel spoke and tire in manner as shown in either of the United States Patents Nos. 101,948, 114,307. In my wheel the ferrule has a partition extended across it, and above such partition it is provided with a female screw to receive a separate male screw, D, extended up into the recess *b* of the tire, and provided with a nut, E, all as hereinbefore specified. With my invention I unite the advantage of having the nut outside of the spanner with the male screw separate from the ferrule, and capable of being readily removed in case of breakage, and being substituted by another, without the necessity of changing the ferrule.

I therefore claim—

The ferrule C, provided with the partition *a* and the female screw, to receive and support the separate male screw D, in combination with said screw D, the spoke B, the nut E, and the tire provided with the recess *b* and spanner G, all as set forth.

DEXTER CUSHMAN.

Witnesses:

R. H. EDDY,  
J. R. SNOW.