

(No Model.)

F. TRUMP.  
CRANK SHAFT.

No. 318,056.

Patented May 19, 1885.

Fig. 1.

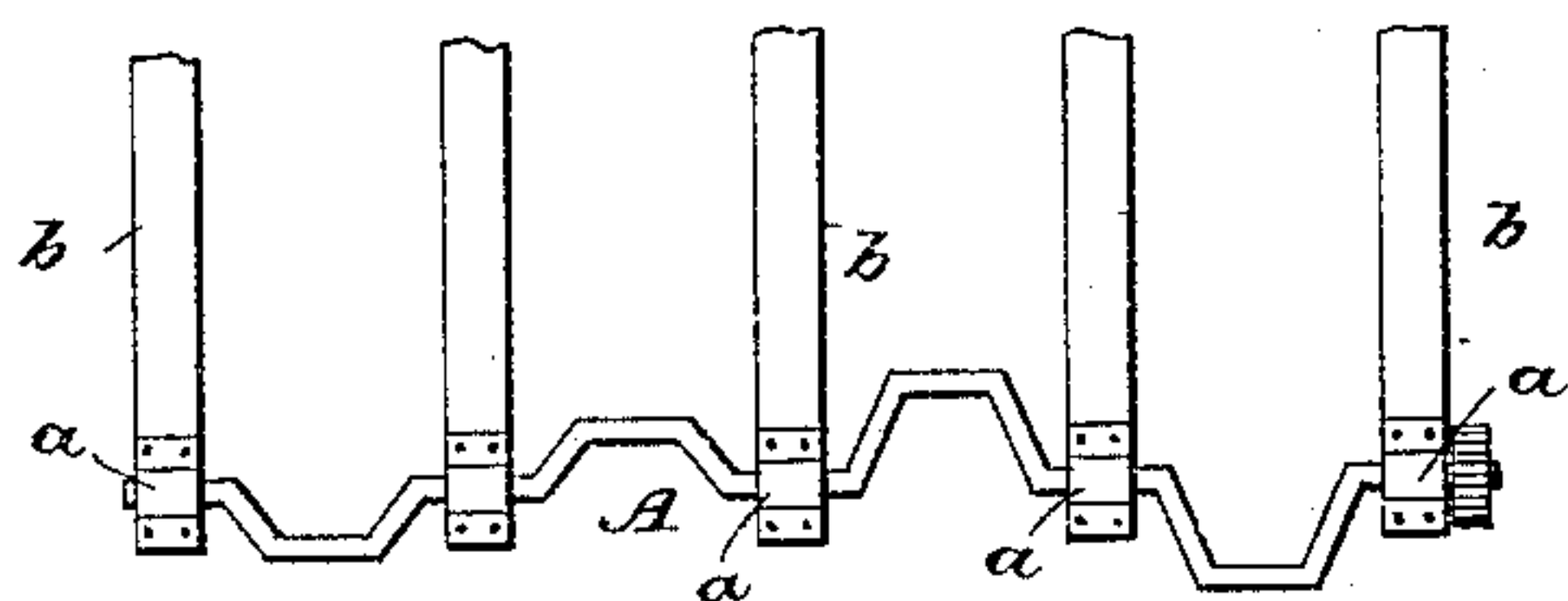


Fig. 2.

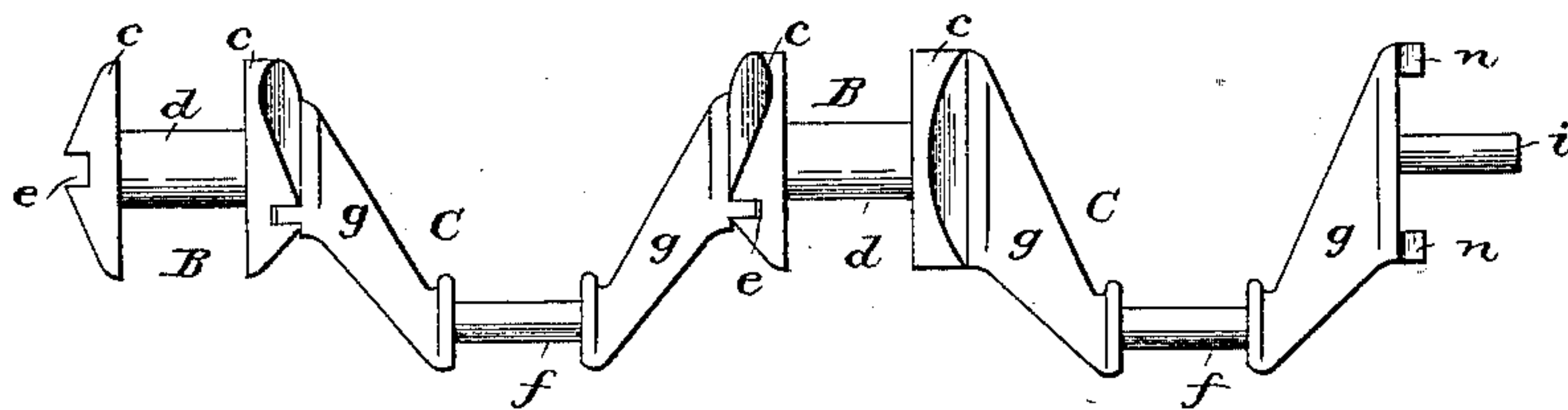


Fig. 3.

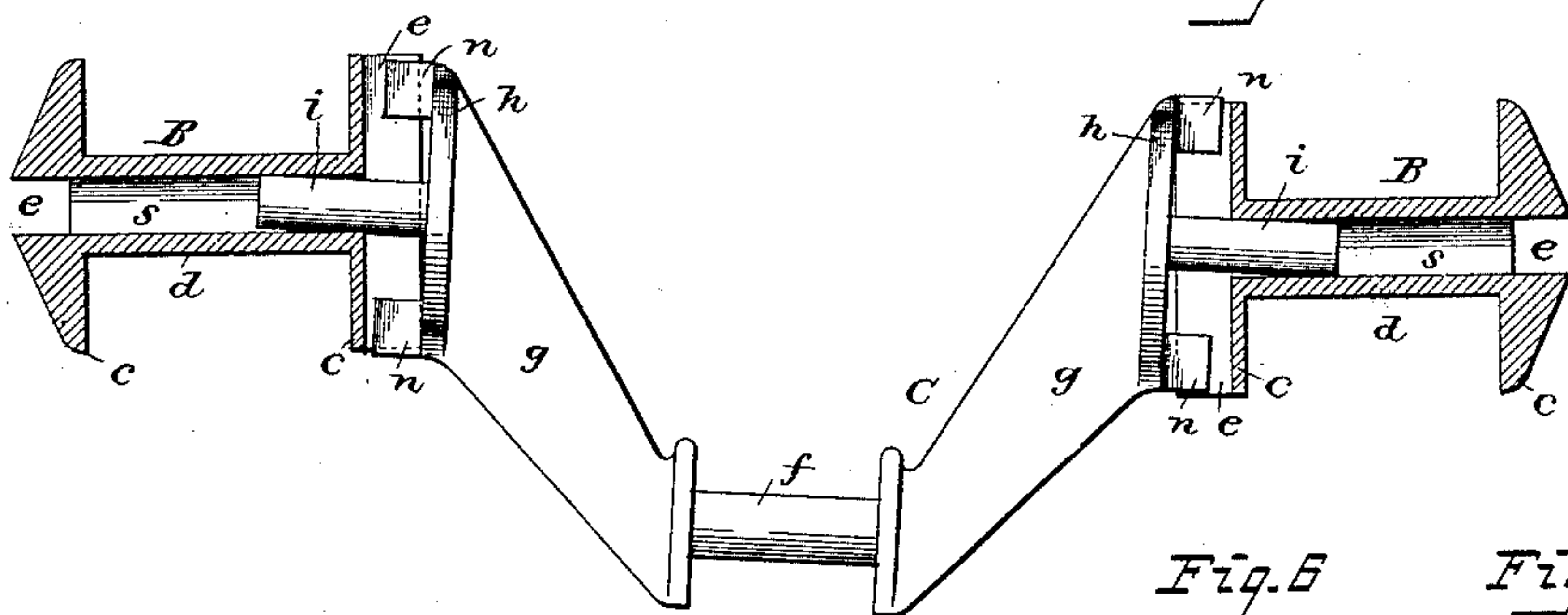


Fig. 4.

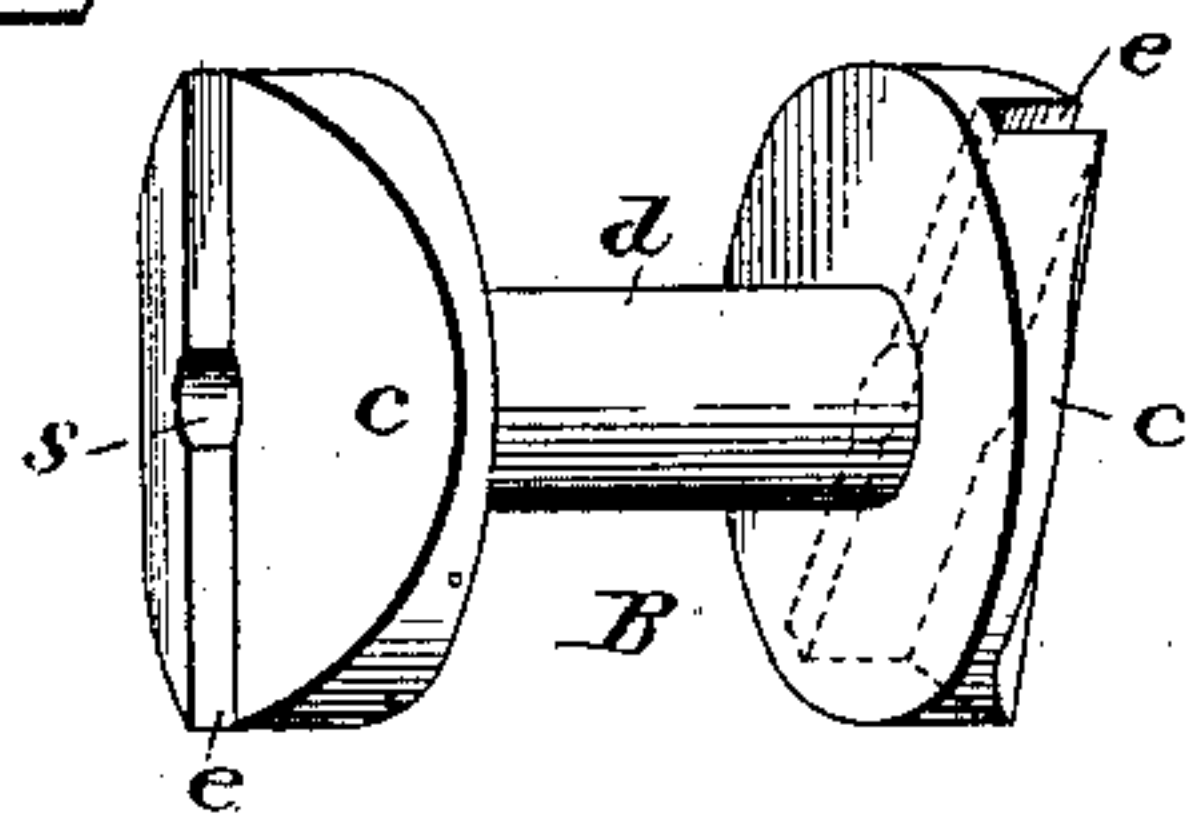


Fig. 5.

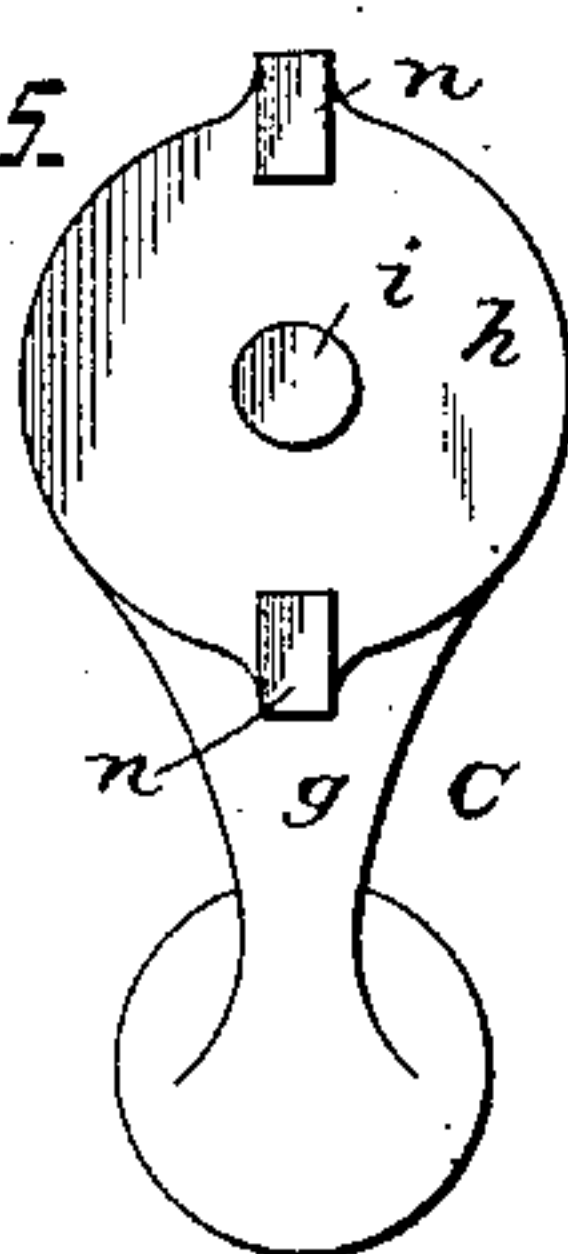


Fig. 6.

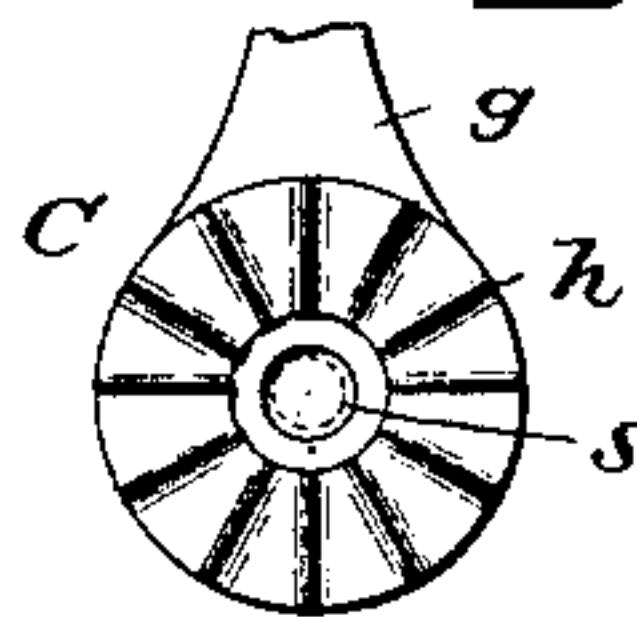
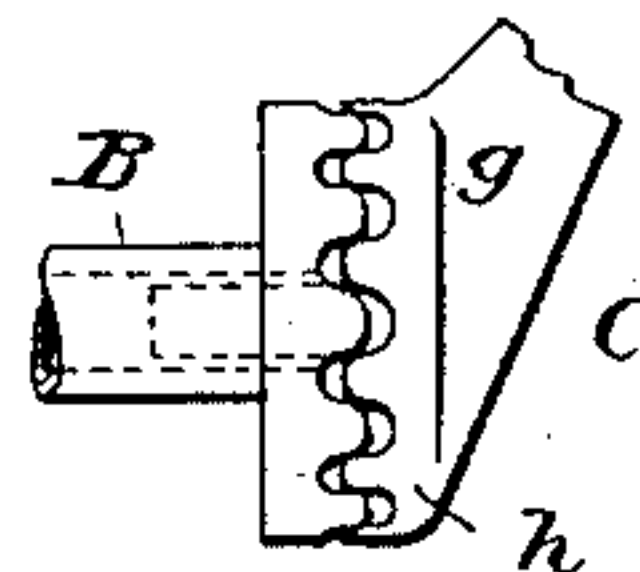


Fig. 7.



Attest:

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# UNITED STATES PATENT OFFICE.

FULLER TRUMP, OF SPRINGFIELD, OHIO.

## CRANK-SHAFT.

SPECIFICATION forming part of Letters Patent No. 318,056, dated May 19, 1885.

Application filed April 17, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, FULLER TRUMP, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Crank-Shafts, of which the following is a specification.

My invention relates to that class of crank-shafts in which a series of cranks are united to form a single shaft for operating a series of arms, rods, or other devices; and my invention consists in constructing the shaft of loosely-connected sections, as fully set forth hereinafter, so that the shaft will revolve freely, even should one of the sections get slightly out of line with the others.

In the drawings, Figure 1 is a plan view of sufficient of a hay-tedder to illustrate the construction and arrangement of the ordinary multiple crank-shafts employed in such implements. Fig. 2 is a side view illustrating a portion of one of my improved crank-shafts. Fig. 3 is a view in part section of my improved shaft. Fig. 4 is a perspective view of one of the coupling or bearing pieces of the shaft. Fig. 5 is an end view of one of the crank-pieces. Figs. 6 and 7 are views illustrating a modification.

In that class of apparatus in which a number of arms are operated from a single shaft having a number of cranks, one of which operates upon each of the arms, it is common to provide a number of bearings between the cranks, so as to prevent the shaft from sagging and avoid the necessity of making it of heavy material. Such shafts are used in wool-washers, propellers, &c., but are more commonly employed in hay-tedders, where the bearings or boxes *a* are supported by bars *b* of the frame, and support the crank-shaft A, as shown in Fig. 1.

A serious objection to the construction above set forth results from the fact that the bars *b*, being of light material and exposed to the weather, are apt to twist and warp, so as to carry the bearings out of line with the axis of the shaft and bind upon the shaft with more or less friction, occasioning the rapid wear of the journals and interfering with the operations of the machine. In order to overcome this defect, I make the shafts of a series of sections loosely jointed together, so that while one por-

tion of the shafts cannot be turned independently of the others each part may be moved slightly out of line with the axis of the other. 55

The shaft may be differently constructed in order to secure this result. Thus it may consist of bearing-pieces B, each adapted to revolve with one of the bearings, and crank-sections C, each having at each end projections or recesses adapted to corresponding projections of the coupling-section or bearing-piece, one of the said projections being of such length as to prevent one section from being moved laterally away from the other, and all of the openings being larger than the projections, so as to permit a limited play of one part in respect to the other. 60 65

In Figs. 2 to 5 each coupling-piece is shown as consisting of a hollow journal, *d*, and terminal heads or disks *c c*, in each of which is a transverse slot, *e*, the slot in one disk being at an angle to that in the other, and the face of the disk being beveled from the edge of the slot to the opposite ends of the disk. Each crank-section has a central bearing, *f*, and two arms, *g g*, and from the face of each arm where the end thereof forms a hub, *h*, project a central pin, *i*, and studs *n*, the pin *i* fitting the central opening, *s*, in the bearing-piece B, but being smaller in diameter than the said opening, and the lugs fitting loosely in the transverse slot *e*. 70 75 80

The parts above described may be built up and form a continuous shaft with the cranks at different angles, in the manner illustrated in Fig. 2, the end of each crank being applied to the end of one of the coupling or bearing pieces B, each of which is set in one of the bearing-boxes *a* in the position shown in Fig. 1. 85 90

Upon motion being imparted to a crank constructed and arranged as above described, all the sections thereof will be rotated together; but if one of the bearings should be carried out of line by the warping of its support—as, for instance, the bearing at the right in Fig. 3—the crank-section C, instead of binding against the opposite coupling-pieces, will simply assume an angle thereto, the connecting-lugs playing freely in the corresponding slots or openings, so that the different parts of the shaft will continue to revolve, as before, but without any increase of friction. 95 100

It will be evident that the projections and



recesses in the corresponding ends of the sections may be of different forms, while permitting the said sections to be loosely connected, but in such manner as to turn one with the other. Another form of connection is illustrated in Figs. 6 and 7, in which each section has a series of teeth arranged in a circle and adapted to corresponding but larger intermediate recesses upon the opposite section.

10 I do not here claim a shaft consisting of flanged bearing-pieces with slotted ends and crank-pieces with ends and lugs upon the opposite ends of the crank-arms, as the same is the subject-matter of Letters Patent No. 15 296,368, granted to me April 8, 1884.

Without limiting myself to the precise construction and arrangement of parts shown and described, I claim—

20 1. A crank-shaft consisting of a series of sections loosely connected to turn together, but so as to permit one section to have a limited lateral play in respect to the adjacent sections, substantially as set forth.

2. The combination, in a crank-shaft, of a series of crank-sections and a series of intermediate sections adapted to bearing-boxes, each section having one or more recesses at the end adapted to receive corresponding but smaller projections upon the adjacent section, substantially as described. 25 30

3. The combination of a series of coupling pieces or sections adapted to turn in boxes secured to independent supports and a series of intermediate crank-pieces or sections, each section having upon each end projections or recesses adapted to fit loosely corresponding projections or recesses at the opposite ends of the adjacent sections, substantially as set forth. 35 40

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

F. TRUMP.

Witnesses:

A. L. SLAGER,  
W. A. SCOTT.