

(No Model.)

J. A. GOWANS.

SCREW CONVEYER FOR GRAIN.

No. 349,155.

Patented Sept. 14, 1886.

Fig. 1.

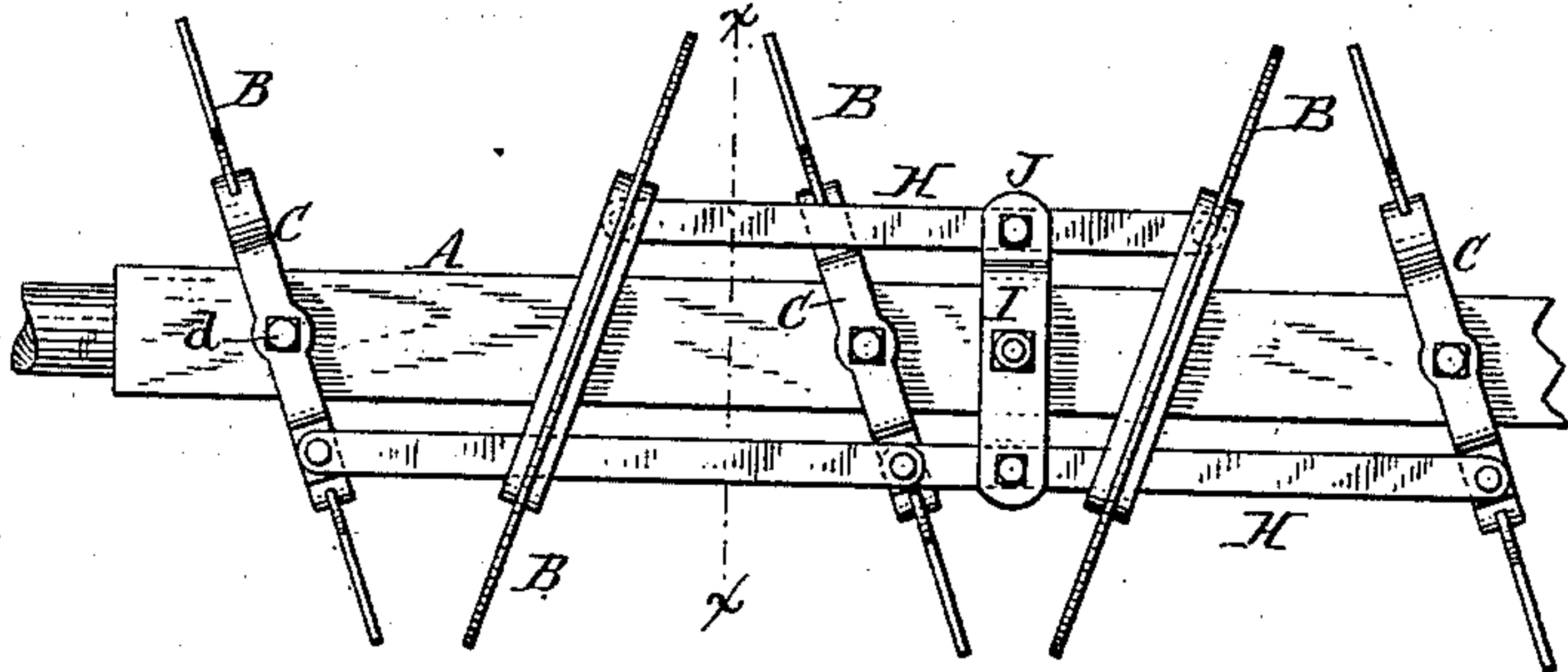


Fig. 2.

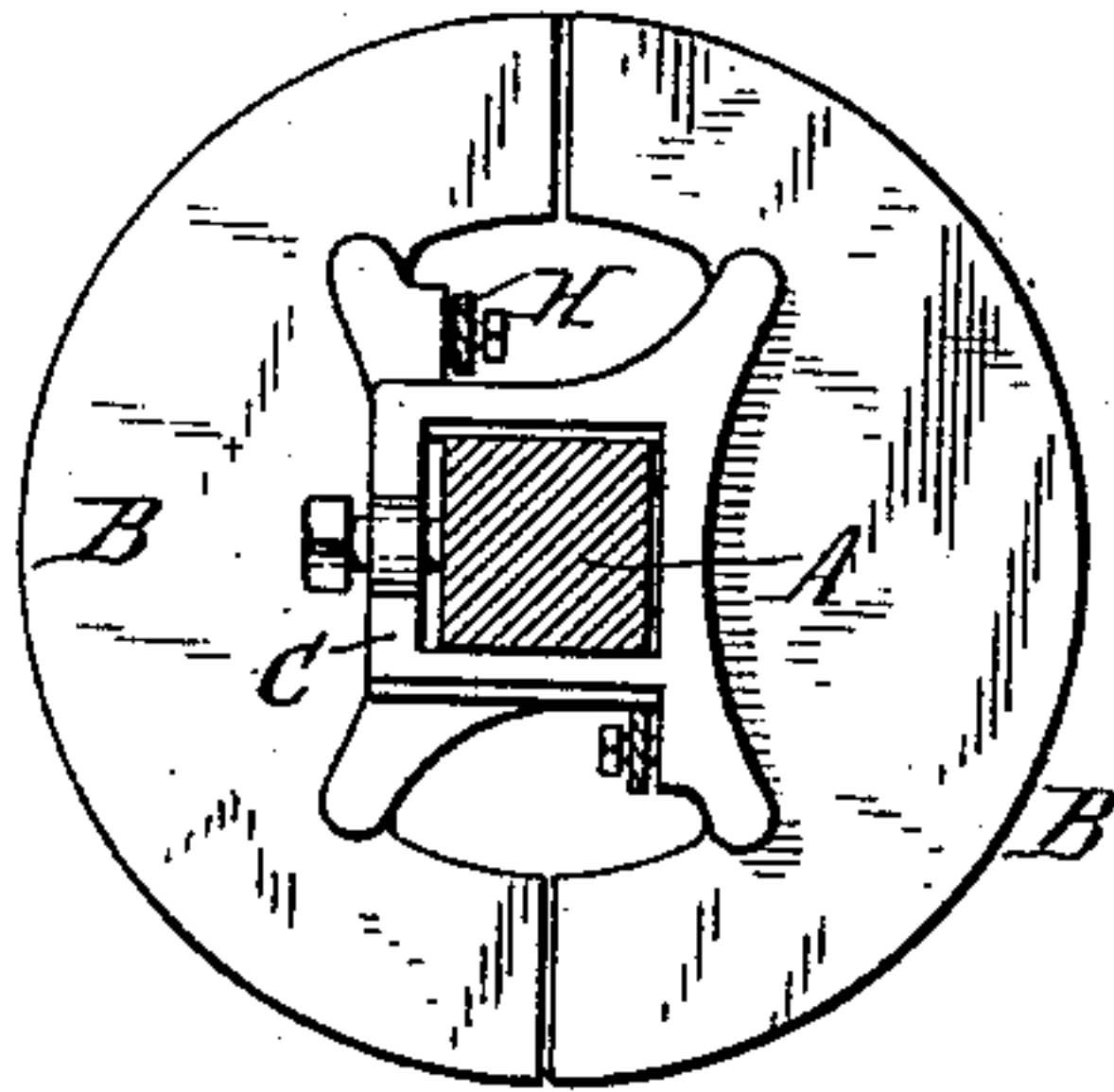


Fig. 3.

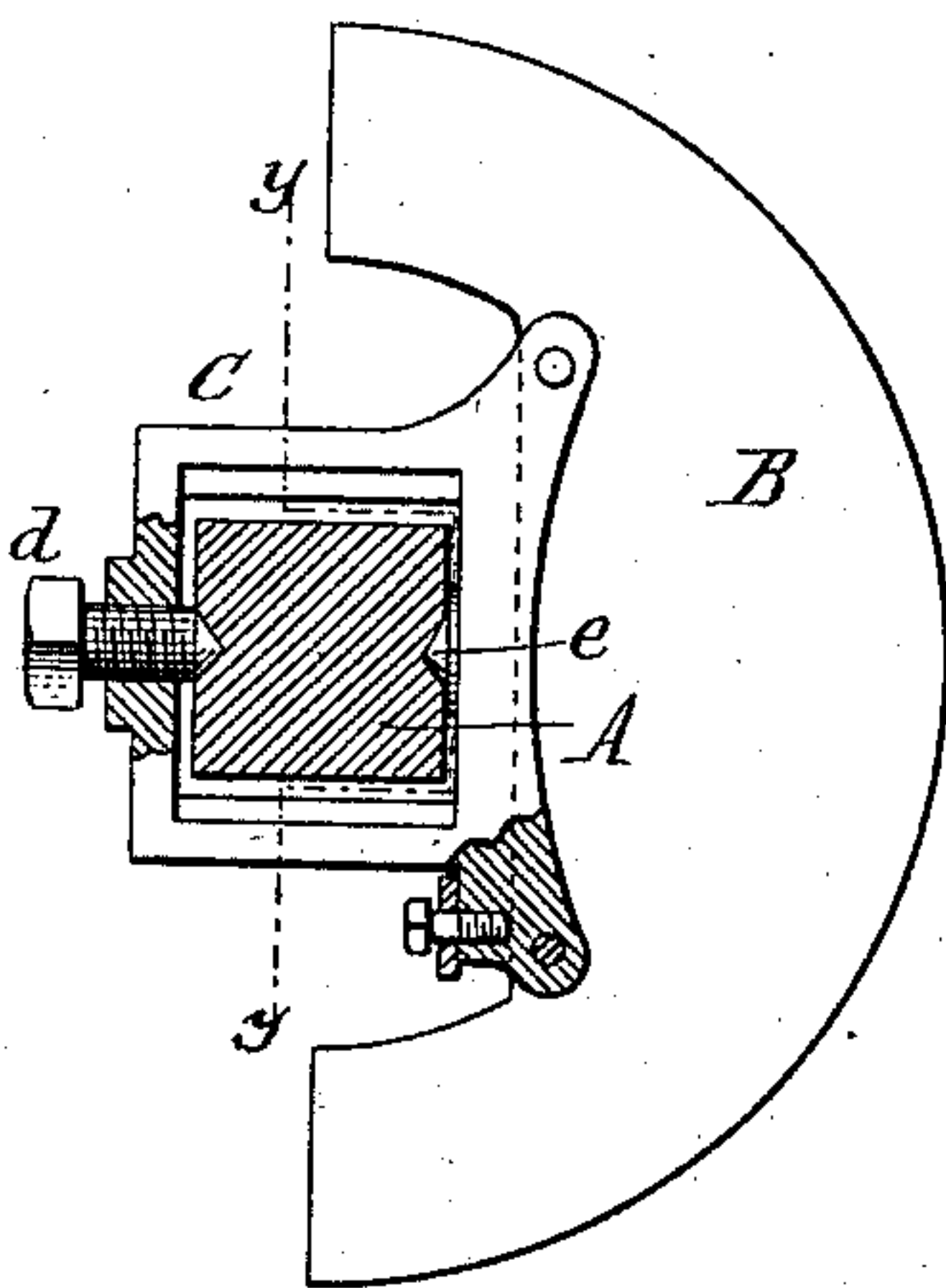


Fig. 4.

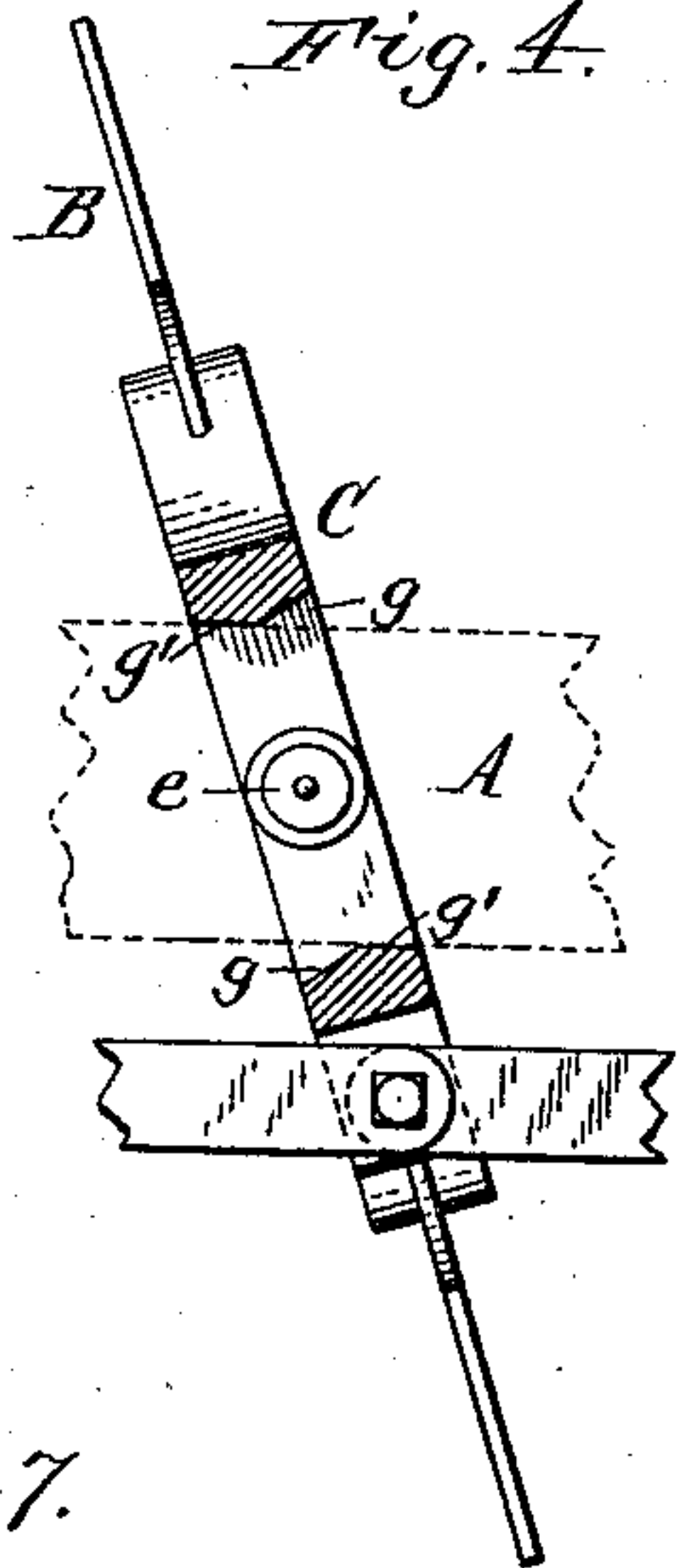


Fig. 5.

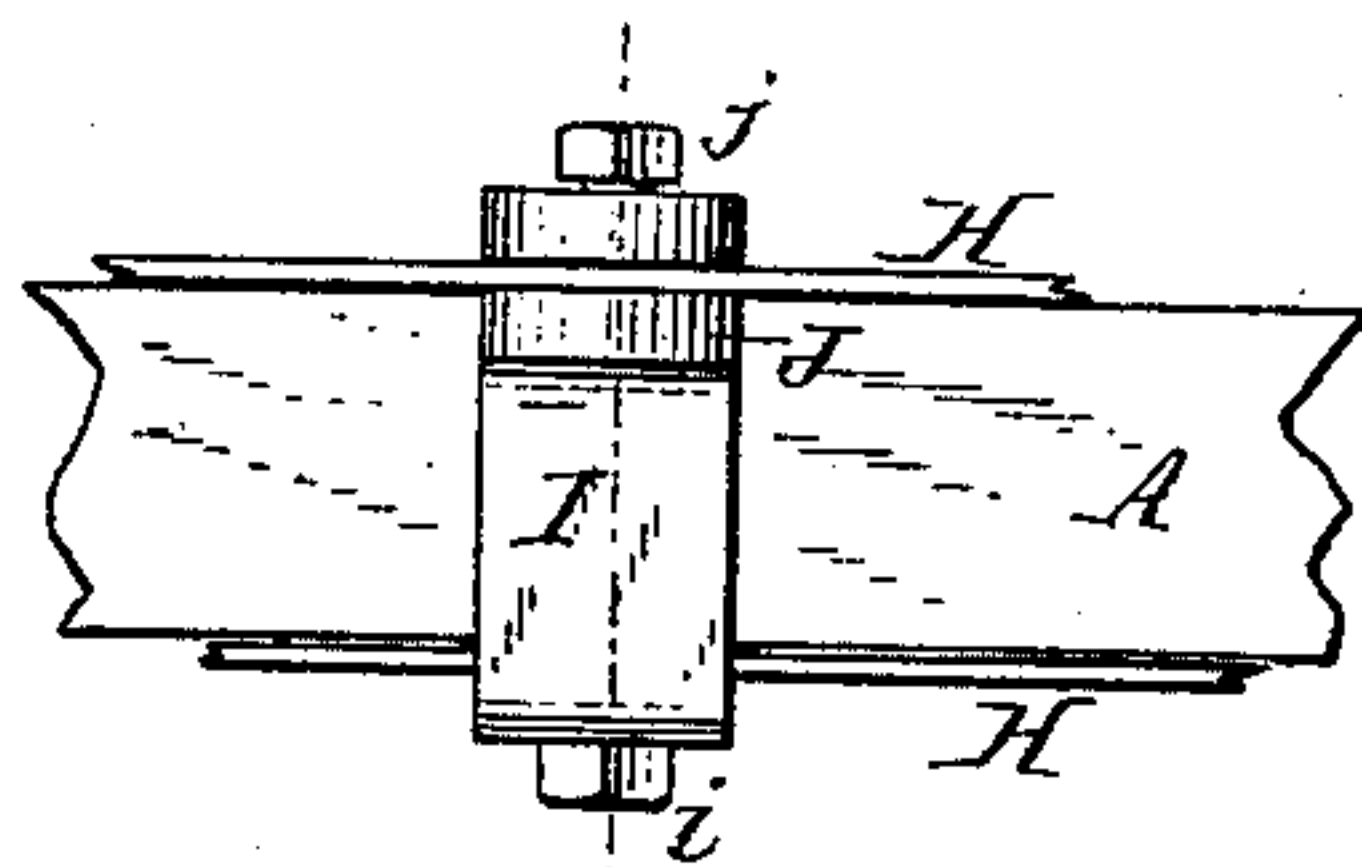


Fig. 6.

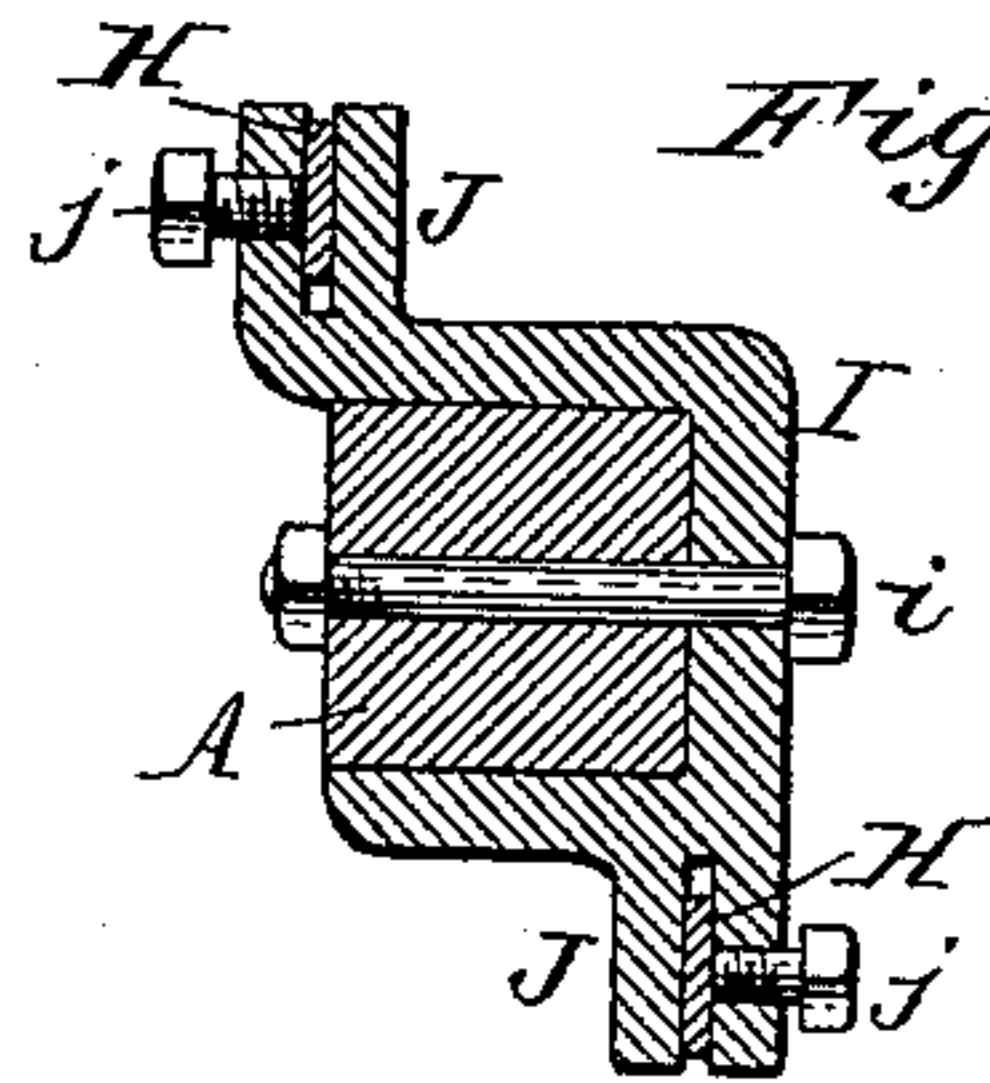


Fig. 7.

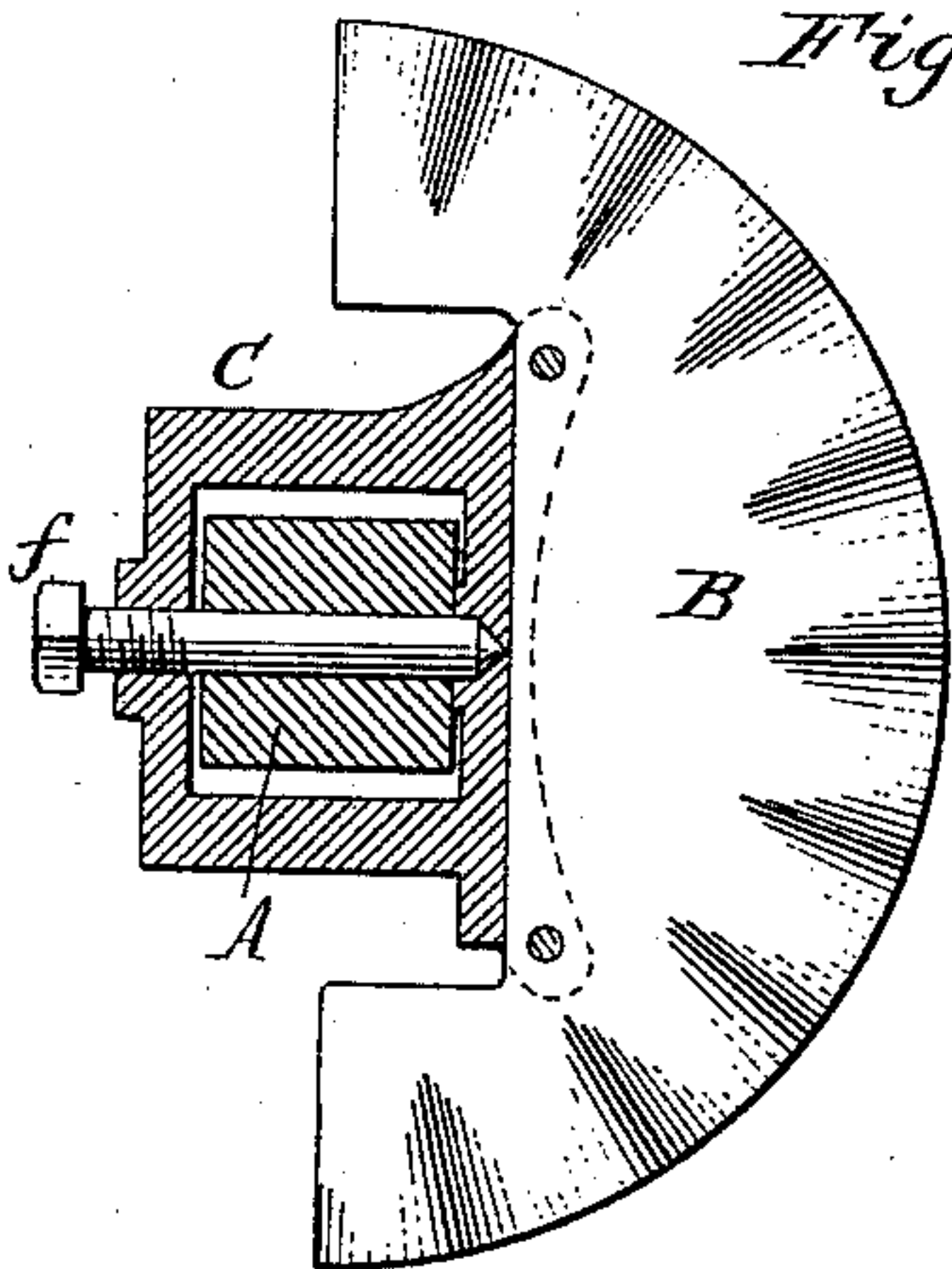


Fig. 8.

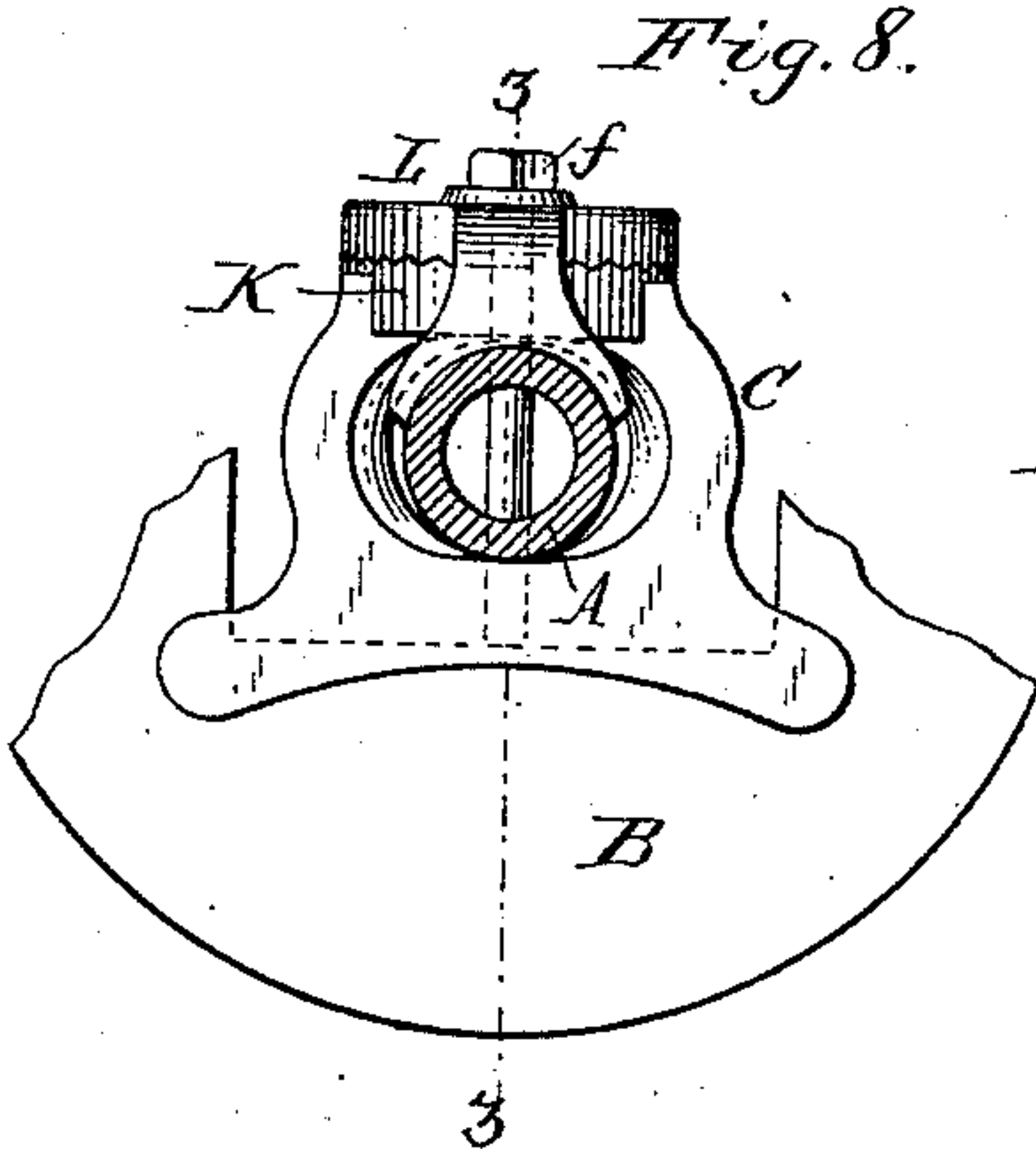
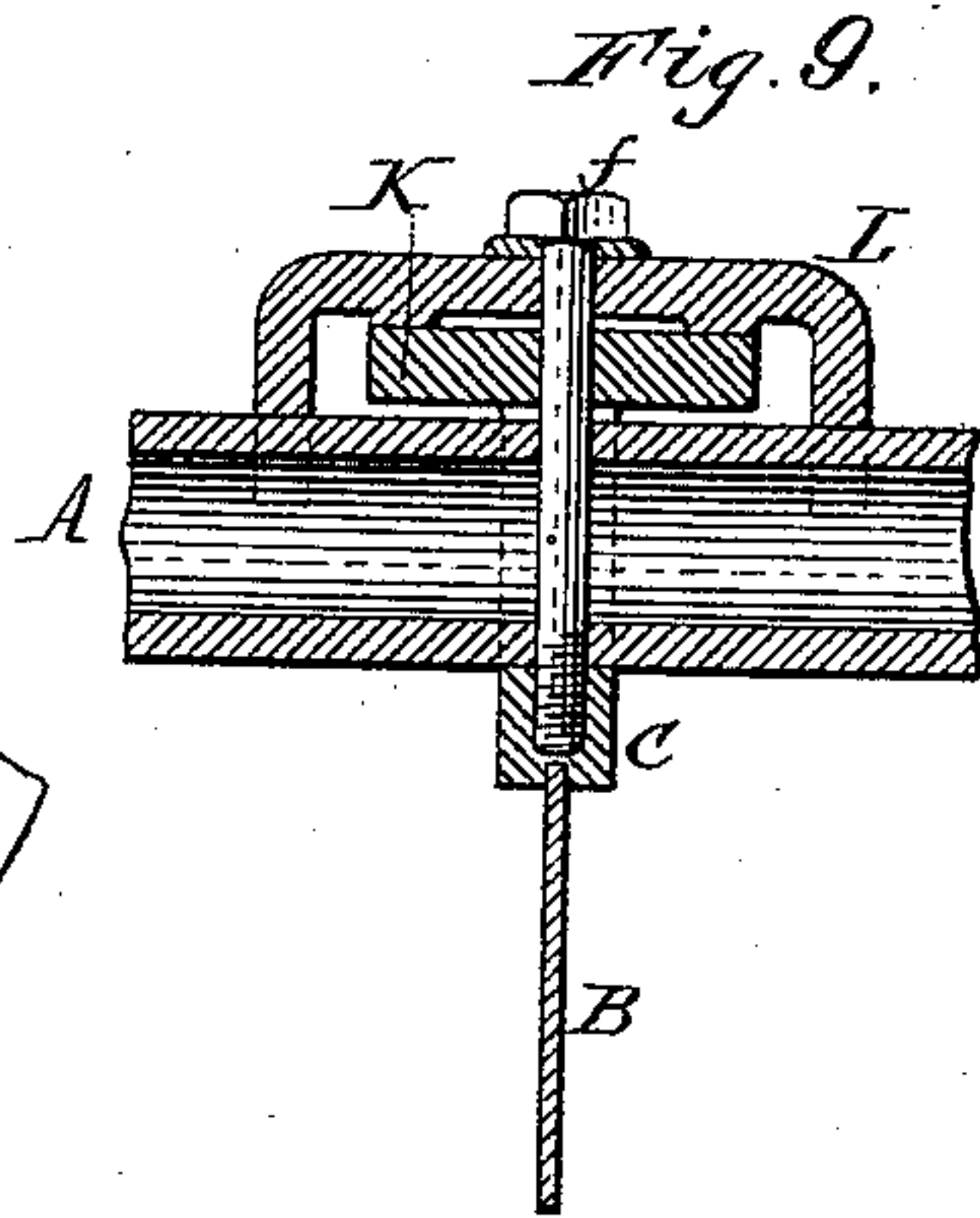


Fig. 9.



Chas. J. Buchheit.
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UNITED STATES PATENT OFFICE.

JAMES A. GOWANS, OF STRATFORD, ONTARIO, CANADA, ASSIGNOR OF TWO-THIRDS TO HENRY L. GATES, OF SAME PLACE, AND JOHN M. DUNCAN, OF BOSTON, MASSACHUSETTS.

SCREW-CONVEYER FOR GRAIN.

SPECIFICATION forming part of Letters Patent No. 349,155, dated September 14, 1886.

Application filed March 6, 1886. Serial No. 194,312. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. GOWANS, of Stratford, in the county of Perth, Province of Ontario, Canada, have invented a new and useful Improvement in Screw-Conveyers, of which the following is a specification.

This invention relates to an improvement in a screw-conveyer in which the flights are adjustably secured to the shaft, so that the angle of the flights with the axis of rotation can be changed in such manner as to reverse the direction in which the flights move the material through the conveyer-trough.

The object of my invention is to provide means for nicely adjusting the flights on the shaft, so that either speed or direction of the movement can be changed at desire; also to provide means for adjusting the flights uniformly and simultaneously.

My invention consists, to that end, of the improvements, which will be hereinafter fully set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is an elevation of a conveyer provided with my improvements. Fig. 2 is a cross-section in line *x x*, Fig. 1. Fig. 3 is a sectional view of the shaft and one of the flights on an enlarged scale. Fig. 4 is a section in line *y y*, Fig. 3, on an enlarged scale. Fig. 5 is a top plan view of the guide of the adjusting-rods. Fig. 6 is a cross-section of the same. Fig. 7 is a sectional view of the shaft and one of the flights, showing a modified construction for securing the flight to the shaft. Fig. 8 is a cross-section of a round shaft provided with my improved adjustable flight. Fig. 9 is a longitudinal section in line *z z*, Fig. 8.

Like letters of reference refer to like parts in the several figures.

A represents the conveyer-shaft, which may be square, round, tubular, or of any other suitable form.

B represents the adjustable flights, which may be crescent-shaped or of any other suitable form.

C is a loop or open frame formed on or secured to the inner side of each flight and surrounding the shaft A loosely, so that the flight can be inclined on the shaft in one or the other

direction within the limit fixed by the play of the loop or frame C on the shaft.

As represented in Figs. 1 to 7, the shaft A is made square in cross-section and the loops or frames C are made rectangular and somewhat larger than the shaft. Each flight is secured in position on the shaft A by a set-screw, *d*, and a teat, *e*, entering recesses in the shaft, as represented in Figs. 1, 2, 3, and 4, or by a screw, *f*, passing through the shaft, as represented in Fig. 7, whereby the flight is pivotally secured to the shaft. Upon loosening these screw-fastenings the flights can be turned so as to change their inclination, thereby increasing or decreasing the speed with which they move the material through the conveyer-trough; or they may be reversed, so as to reverse the direction in which they move the material. After the flights have been so adjusted the screw-fastenings are tightened, thereby securing the flights in position on the shaft. The loops C are beveled off on their inner sides, so as to form V-shaped bearing-surfaces *g g'*, which rest against opposite sides of the shaft in the extreme positions of the flight, as represented in Fig. 4.

When it is desired to adjust two or more flights simultaneously and uniformly, they are connected by longitudinal rods H, so that all the flights attached to the same rod are moved together. These adjusting-rods pass through a guide or clamp, I, which is secured to the shaft by a bolt, *i*, or otherwise, and provided with jaws J, in which the rods H are guided. The rods H are secured in the jaws J by set-screws *j* after the flights are adjusted, thereby obviating the necessity of securing each flight separately.

When the conveyer-shaft is round or tubular, as represented in Figs. 8 and 9, the opening in the loop or frame C is made oblong or elliptical, and the frame is provided with a serrated head or disk, K, to which is applied a bow-shaped washer, L, which straddles the disk K and rests on the shaft A. The fastening-screw *f* passes in this case through the washer L and head K.

The loops C may be made of malleable iron or by drop-forging, and may be riveted to the

flights, or they may be cast in one piece with the flights, as may be preferred. The latter may be made plane, as shown, or they may be curved to form nearly a continuous helix. It will be seen that the angle of the flights can be nicely regulated, so as to increase or reduce the speed with which the material is moved by the flights, thereby rendering this construction especially desirable for feeders by which material is supplied to other machines. It is also obvious that the flights can be readily reversed, so as to move the material in an opposite direction, which is especially desirable for flour-bolts, middlings-purifiers, and similar machines. My improvements are also very desirable when the screw-conveyer is used for mixing two or more different grades of grain, flour, or other material. In this case the flights may be provided with radial corrugations, as indicated in Fig. 7.

I claim as my invention—

1. The combination, with a conveyer shaft, of a flight provided with a loop or open frame which surrounds the shaft loosely with sufficient play to permit the loop or open frame to be inclined toward the axis of the shaft in one or the other direction, and a fastening whereby said loop or frame is adjustably secured to the shaft, substantially as set forth.

2. The combination, with the conveyer-shaft, of a flight provided with a loop or open frame, C, which surrounds the shaft loosely, and can be inclined toward the axis of the shaft in one or the other direction, and a set-screw, d, and teate, whereby the flight is adjustably secured to the shaft, substantially as set forth.

3. The combination, with the conveyer-shaft, of a flight provided with a loop, C, having V-shaped bearing-surfaces *g g'* on its inner sides, substantially as set forth.

4. The combination, with the conveyer-shaft, of adjustable flights provided with loops which embrace the shaft loosely, and a rod whereby the flights are connected and adjusted simultaneously, substantially as set forth.

5. The combination, with the conveyer-shaft, of adjustable flights provided with loops which embrace the shaft loosely, a rod whereby the flights are connected and adjusted simultaneously, and a clamp which is secured to the shaft, and in which said rod is secured, substantially as set forth.

6. The combination, with the conveyer-shaft, of adjustable flights provided with loops which surround the shaft loosely, a rod whereby the flights are connected, and a fastening whereby the flights are adjustably secured in place, substantially as set forth.

7. The combination, with the conveyer-shaft, of adjustable flights provided with loops C, a rod, H, connecting the flights, and a clamp, I, secured to the shaft and provided with jaws J, in which the rod is guided, substantially as set forth.

Witness my hand this 2d day of March, 1886.

JAMES A. GOWANS.

Witnesses:

W. MOWAT,

A. G. MOWAT.