

No. 616,060.

Patented Dec. 13, 1898.

G. E. MITTINGER, JR.
BALL BEARING.

(Application filed Aug. 30, 1898.)

(No Model.)

Fig. 1.

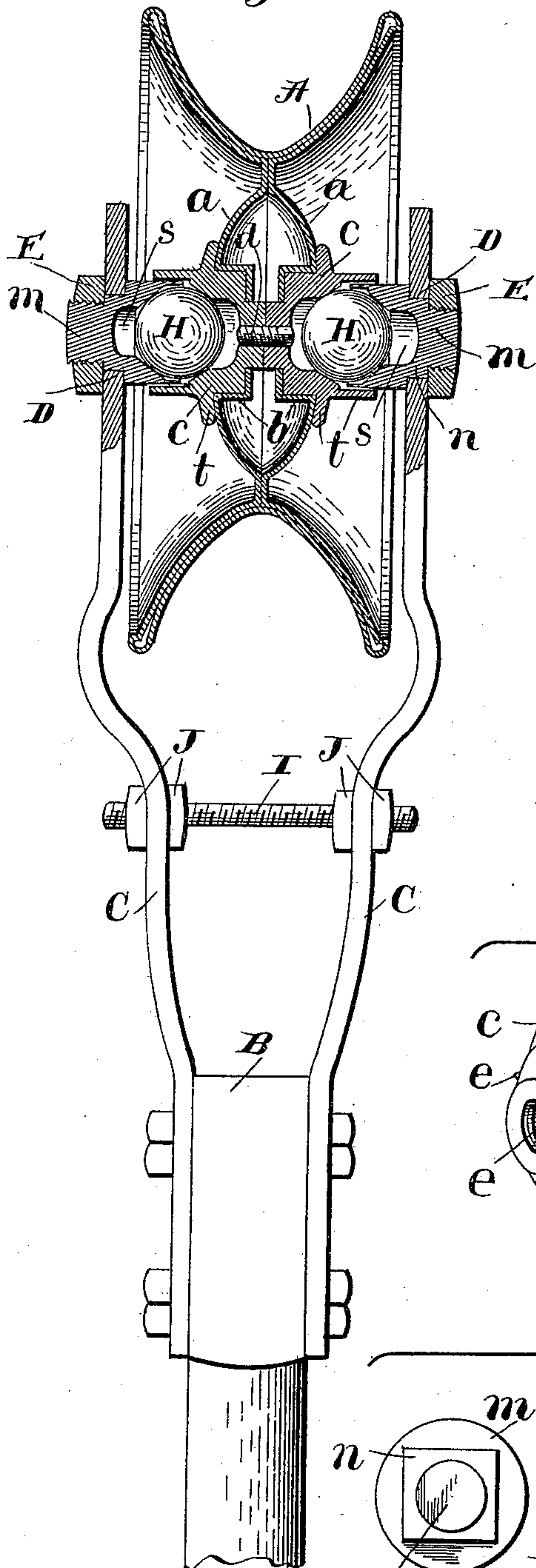


Fig. 2.

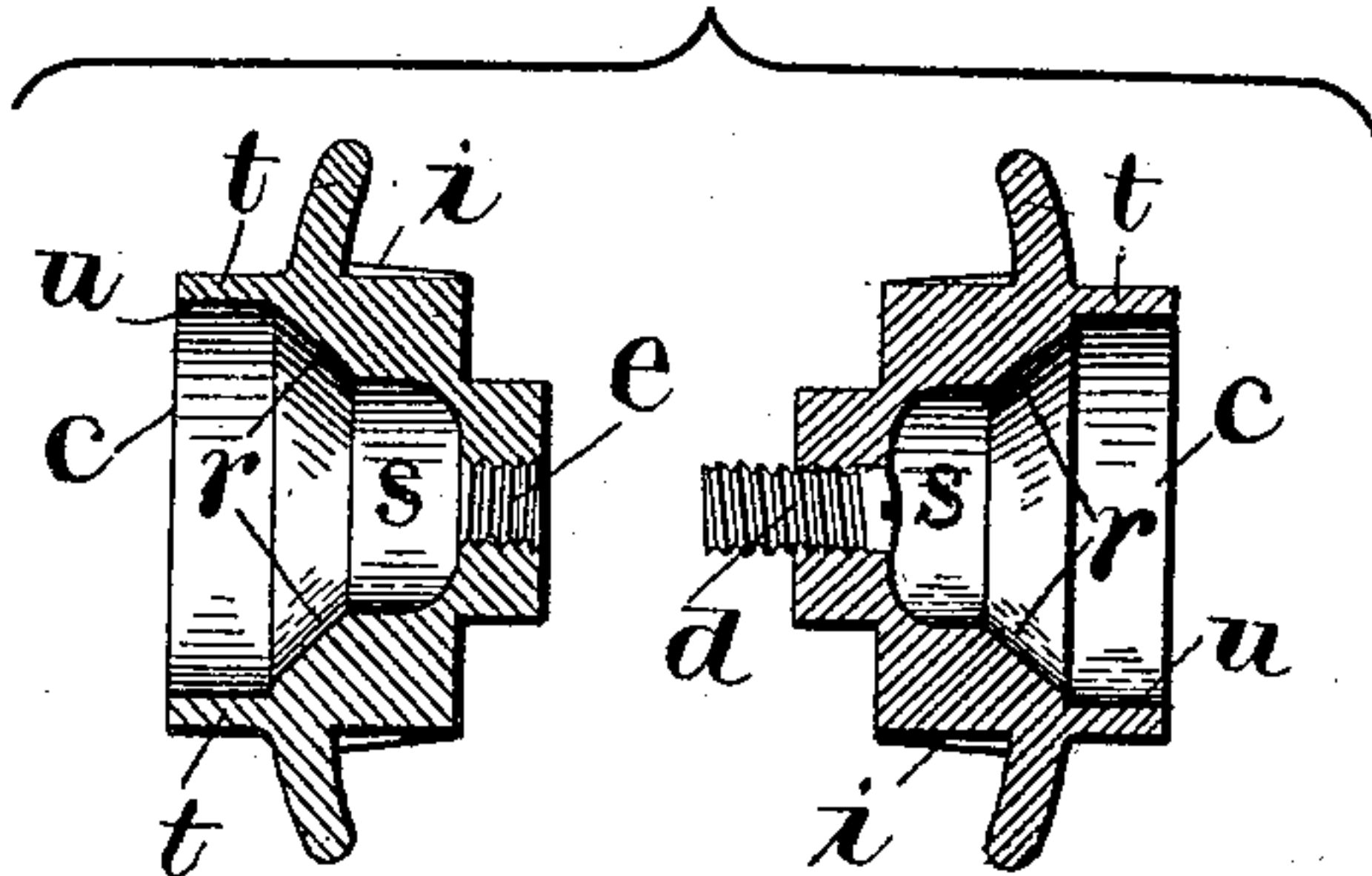


Fig. 3.

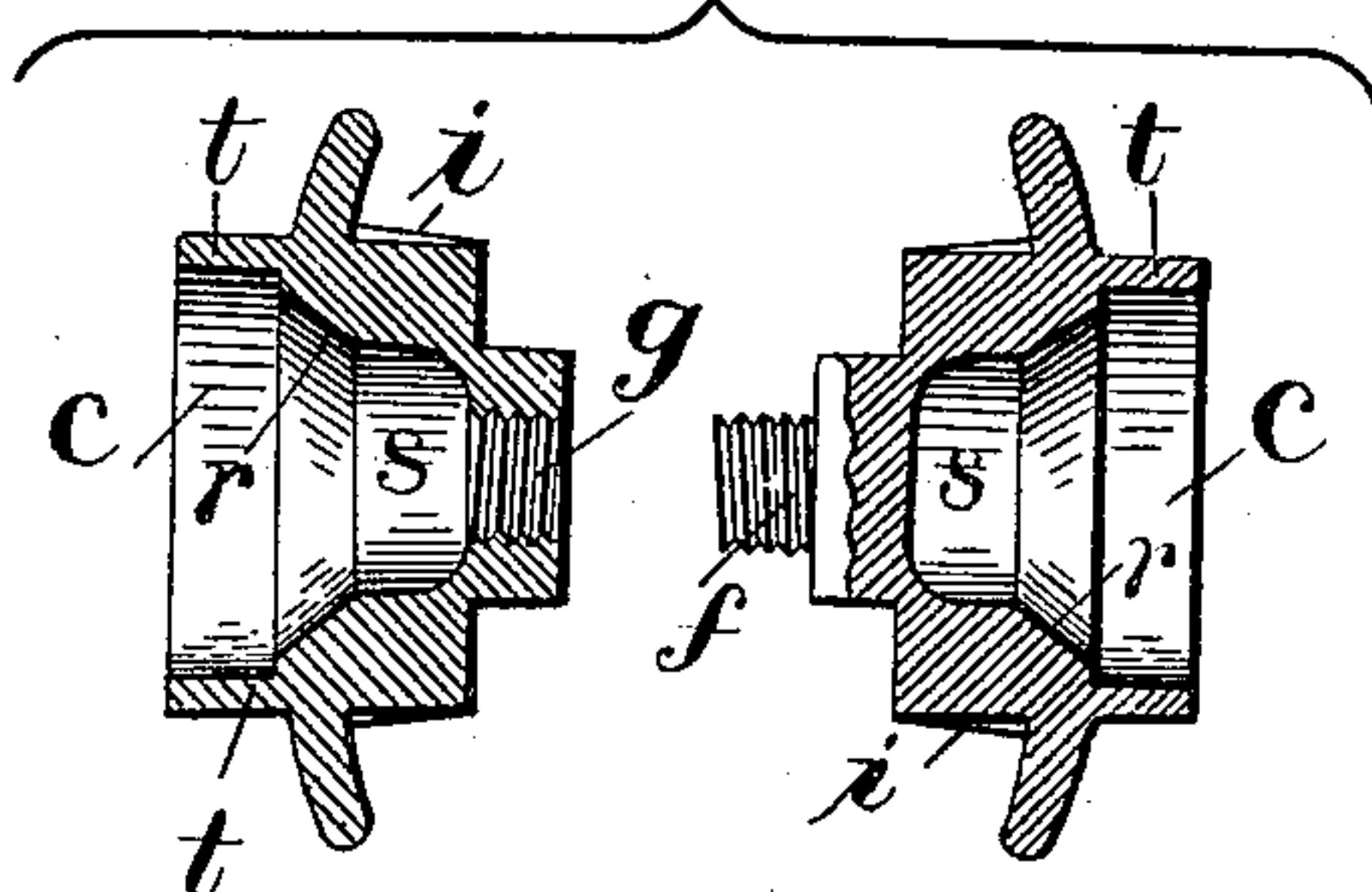


Fig. 4.

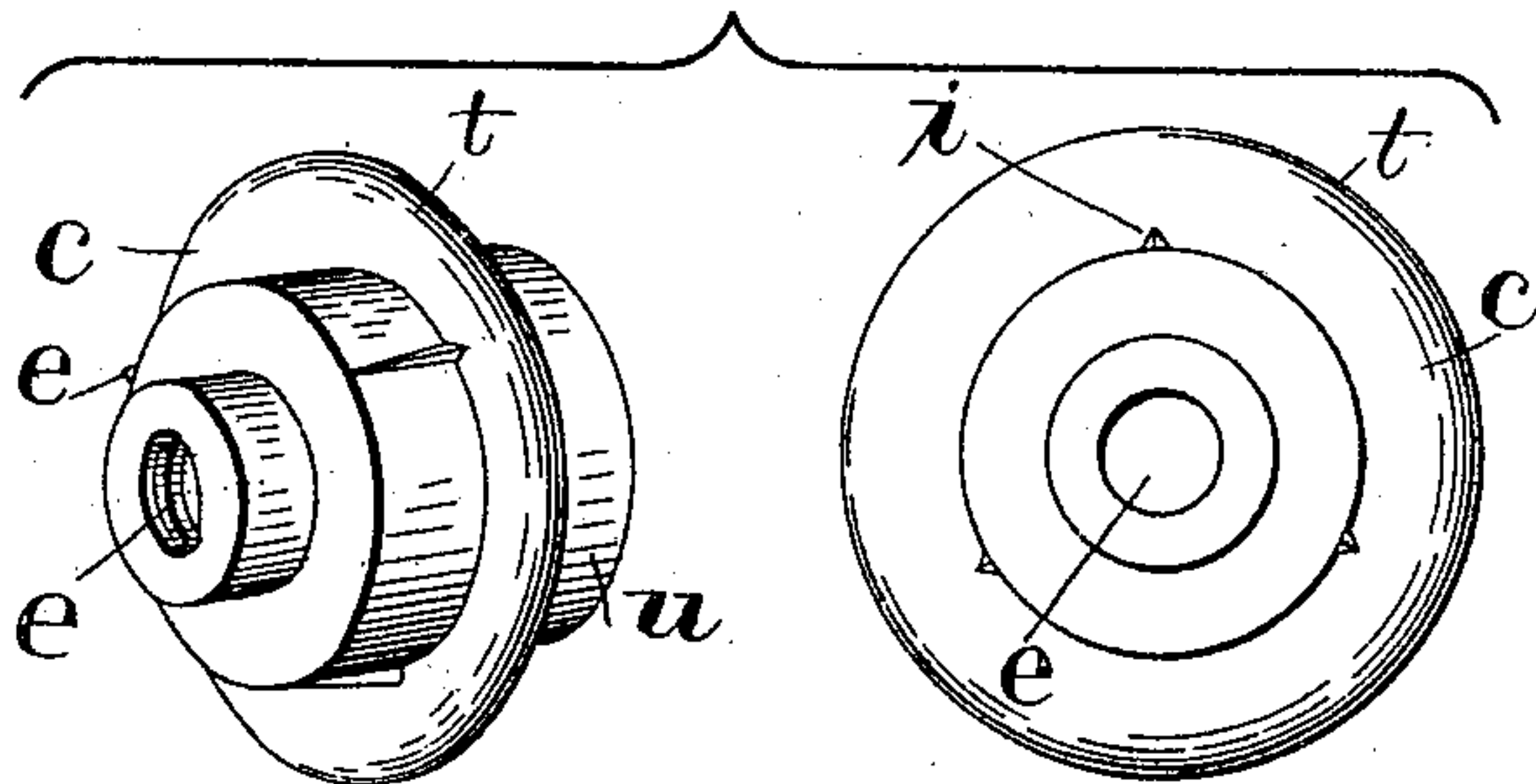
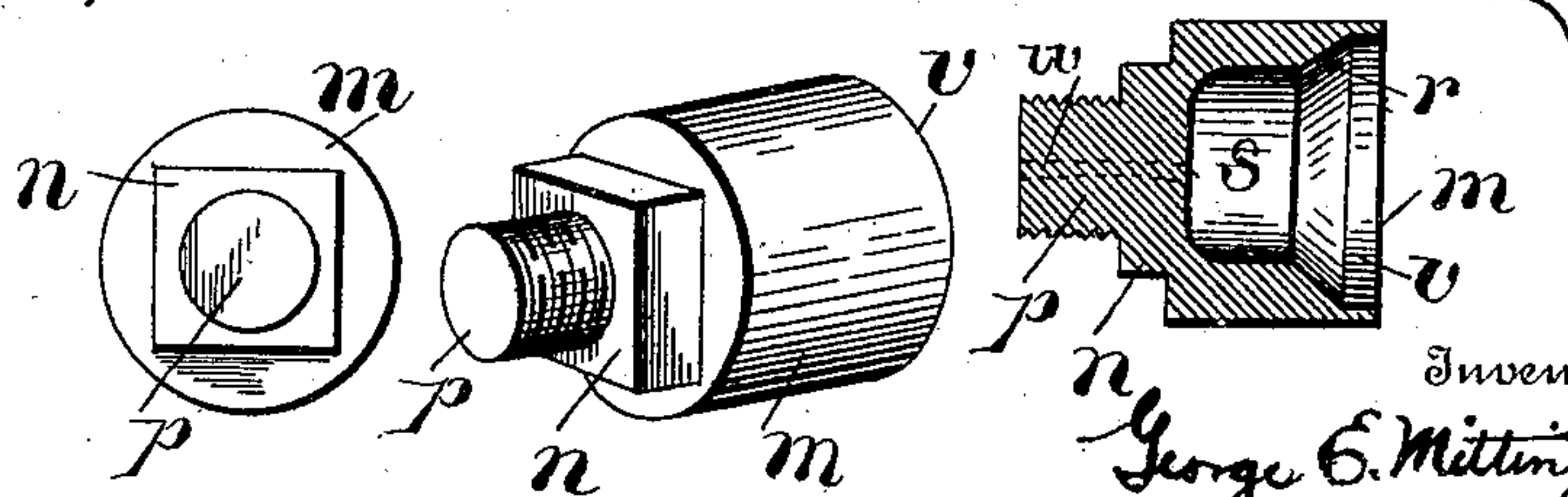


Fig. 5.



Witnesses
Geo. E. Trech.
B. E. Seitz

Inventor
George E. Mittinger, Jr.
by A. S. Patterson,
Attorney

UNITED STATES PATENT OFFICE.

GEORGE E. MITTINGER, JR., OF CLEVELAND, OHIO, ASSIGNOR OF THREE-FOURTHS TO FREDERICK J. SCHWEITZER, OF SAME PLACE.

BALL-BEARING.

SPECIFICATION forming part of Letters Patent No. 616,060, dated December 13, 1898.

Application filed August 30, 1898. Serial No. 689,827. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. MITTINGER, Jr., a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Ball-Bearings, of which the following is a specification.

My invention relates to improvements in ball-bearings, and pertains to a bearing consisting of a single ball at each end of a shaft, all of which will be fully described hereinafter and particularly pointed out in the claims.

The primary object of my invention is to provide a shaft with a concentric cavity at each end thereof for the reception of a single ball and a support or hanger for the shaft at each end thereof provided with a bearing-cup to receive the projecting portion of the ball, whereby a simple, cheap, and easy-running bearing is produced.

A further object of my present invention pertains to the particular construction of the ball chambers or cavities of the bearing, whereby a very small bearing-surface is provided and a chamber or cavity into which the dust and dirt will find its way is also provided.

A further object of my present invention pertains to making the shaft of the wheel of two parts and connecting them together, the outer end of the two parts forming the shaft provided with a concentric ball-cavity, whereby they are adapted to be attached to and detached from a wheel hub or center.

A further object of my invention pertains to providing a sheet-metal wheel having a center formed of two thicknesses, each side of the center provided with an inwardly-extending bearing-block chamber, and to provide separate bearing-blocks for the chambers which are connected through the walls of the center of the wheel, each bearing-block having in its outer end a concentric ball-bearing cavity or chamber, and also to providing an adjustable hanger or support for the outer portion of the bearing, whereby the bearing may be adjusted as desired.

In the accompanying drawings, Figure 1 is a transverse sectional view of a wheel-bearing and hanger embodying my invention.

Fig. 2 is an enlarged detached sectional view

of the wheel bearing-block, showing the balls in position therein and the specific form of the ball-cavities. Fig. 3 is a similar view to Fig. 2, showing a modification in the way of connecting the bearing-block. Fig. 4 is a perspective and end view, respectively, of one of the wheel bearing-blocks. Fig. 5 is a sectional, end perspective, and end view, respectively, of the hanger or support bearing-block.

Referring now to the drawings, A indicates a wheel composed of a single sheet of metal, the center of the wheel consisting of the two side pieces *a*, each having a concentric inwardly-projecting bearing-block cavity *b*, in which the wheel bearing-blocks *c* are seated, as clearly shown in Fig. 1. These wheel bearing-blocks *c* are separate, as illustrated in Figs. 2 and 3, and are united through the sides *a* of the wheel in any desired manner. In Figs. 1 and 2 I show these bearing-blocks united by means of a screw *d*, which passes through a concentric opening in one of the bearing-blocks and into a concentric threaded opening *e* of the other bearing-block. These bearing-blocks thus serve to brace the center of the wheel by being united therethrough and are adapted to be quickly attached to and detached from the wheel either for substituting a new bearing-block for one which is worn or injured or for any other reason. In Fig. 3 I show a modification of the manner of attaching these blocks, which consists in providing one of the bearing-blocks with an integral projecting screw-threaded stud *f*, which screws into a concentric internally-screw-threaded opening *g*, thus serving to unite these parts by the turning of one of the bearing-blocks. In order to prevent these bearing-blocks *c* turning in their cavities *b*, the periphery of the inner ends of the bearing-blocks are provided with the tapered ribs *i*, whereby the forcing of the blocks within the cavities will form in the sheet metal a corresponding groove, thus preventing the bearing-blocks from turning. Where the construction shown in Fig. 3 is used, one of the bearing-blocks will not be provided with these ribs, whereby it can be turned to position, and, if necessary, afterward secured against turning in any desired manner.

In Fig. 1, B indicates a trolley-pole, and C the hanger-arms, which are provided at their extremities with bearing-block openings D.

In Fig. 5 are illustrated the hanger or supporting bearing-blocks *m*, which are provided with a projection *n*, adapted to fit in the openings D of the arms, and are then clamped in position through the medium of a clamping-nut E fitting upon a projecting screw-threaded portion *p*. The inner ends of these bearing-blocks are provided with a ball-cavity, similar to the ball-cavities of the wheel bearing-blocks *c*.

The ball-cavities in the wheel and supporting-arm bearing-blocks consist of an annular bearing-surface *r*, against which the large balls H rest and have their bearings. The inner portions of these cavities are cut away, as indicated as *s*, whereby the bearing-surface *r* can be reduced to any desired extent, and these cavities *s* receive the dirt and dust. Owing to the small bearing-surface *r* of the ball-bearing cavities, dirt is prevented from accumulating upon these surfaces, and owing to the rotation of the balls and of the bearings upon the balls any dirt is prevented from accumulating upon these narrow surfaces and will gradually find its way into the dirt and dust receiving cavities *s*. The bearing-blocks *c* are provided with outwardly-projecting concentric flanges *t*, leaving considerable space *u* for receiving corresponding and oppositely-projecting flanges *v*, upon the supporting-arm bearing-block *m*, whereby approximately a dirt and dust proof bearing is provided. The flanges *v* do not engage the balls H, and sufficient space is left, as illustrated in the sectional view Fig. 5, to permit some play of the ball without engaging the said flanges. This construction of ball-bearing cavities is found to reduce the friction and to make an easy-running wheel, and in trolley-wheels a large ball of this character is especially desirable and effective in making a good electric contact between the hanger or supporting arms C and the trolley-wheel A. The large balls are not subject to being burned or crystallized to the extent that small balls are, and are found to make much better electric contact and one which is highly satisfactory in practice.

In order to adjust the bearings, I provide a transverse adjusting bolt or member I, passing through the supporting arm or hangers and provided with inside and outside adjusting-nuts J, whereby the arms may be drawn together or forced apart to effect the proper adjustment of the ball-bearing, as will be readily understood.

A wheel and bearing as herein shown and described is simple, effective, and cheap to produce, and while especially adapted, as before stated, for use as a trolley-wheel is equally as well adapted for other purposes, and I therefore do not limit my invention to the use of the wheel and bearing for a trolley-wheel.

If desired, the supporting bearing-block *m* may be provided with a longitudinal opening *w*, as indicated by dotted lines in sectional view of Fig. 5, through which oil can be fed to the bearings, and these openings may be closed in any well-known manner.

While I have described the blocks *c* as "blocks," it will be readily understood that they, in effect, form a shaft for the wheel when united and may aptly be termed, generically, as a "shaft."

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

1. A wheel having at each side a ball-cavity situated at the center of rotation thereof, supporting bearing-blocks having registering ball-cavities, and a single ball in each pair of cavities, the balls projecting from the wheel-cavities into the supporting-block cavities and a connection for the supporting-blocks passing around the wheel and adapted to permit it to freely revolve, substantially as described.

2. A wheel having bearing-block cavities at each side of its center, separate bearing-blocks situated in the cavities, said blocks provided with ball-cavities at the center of rotation, a uniting member for the separate bearing-blocks, supporting bearing-blocks having registering cavities, and a single ball situated in each pair of cavities, substantially as described.

3. A sheet-metal wheel having its center formed of two thicknesses, each part of the center provided with a separate inwardly-projecting bearing-block cavity, separate bearing-blocks situated therein and each provided with a ball-bearing cavity at the center of rotation, a uniting member passing through the inner walls of the bearing-cavities and uniting the bearing-blocks, supporting bearing-blocks having registering openings, and a single ball for each pair of cavities, substantially as described.

4. A ball-bearing comprising a shaft provided with concentric ball-cavities in the ends thereof, supporting bearing-blocks having ball-cavities projecting in the opposite direction to those in the shaft, adjustable supporting-arms for the said supporting bearing-blocks, and a single ball situated in each pair of cavities, substantially as described.

5. A wheel comprising a shaft having concentric ball-bearing cavities in the ends thereof, supporting-arms provided with bearing-blocks at each end of the shaft and having oppositely-extending ball-bearing cavities, a single ball situated within each pair of cavities, and an adjustable member passing transversely through the supporting-arms at a point beyond the periphery of the wheel and adapted to separate or draw together the said arms and thus adjust the bearings, substantially as described.

6. A single ball-bearing comprising a shaft provided at each end with a concentric ball-

bearing cavity, supporting bearing - blocks provided with registering ball-bearing cavities, the shaft and the supporting bearing-blocks having overlapping flanges out of contact with the balls, and a single ball in each pair of cavities, substantially as described.

In testimony whereof I have hereunto set

my hand in the presence of two subscribing witnesses.

GEORGE E. MITTINGER, JR.

Witnesses:

FREDERICK J. SCHWEITZER,
A. S. PATTISON.