

(No Model.)

A. P. BICKMORE.

GIMBAL JOINT.

No. 315,112.

Patented Apr. 7, 1885.

Fig. 1.

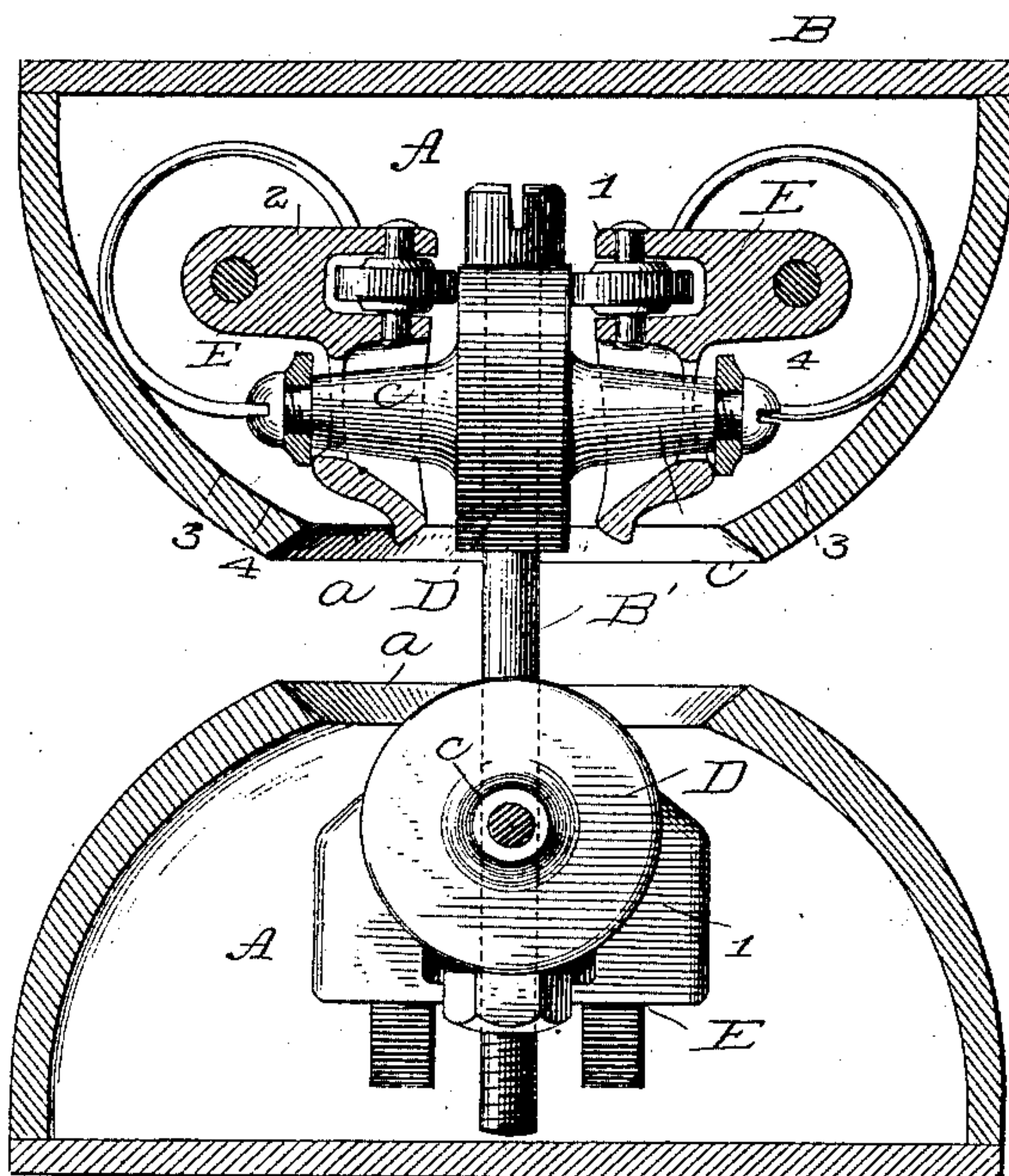


Fig. 2.

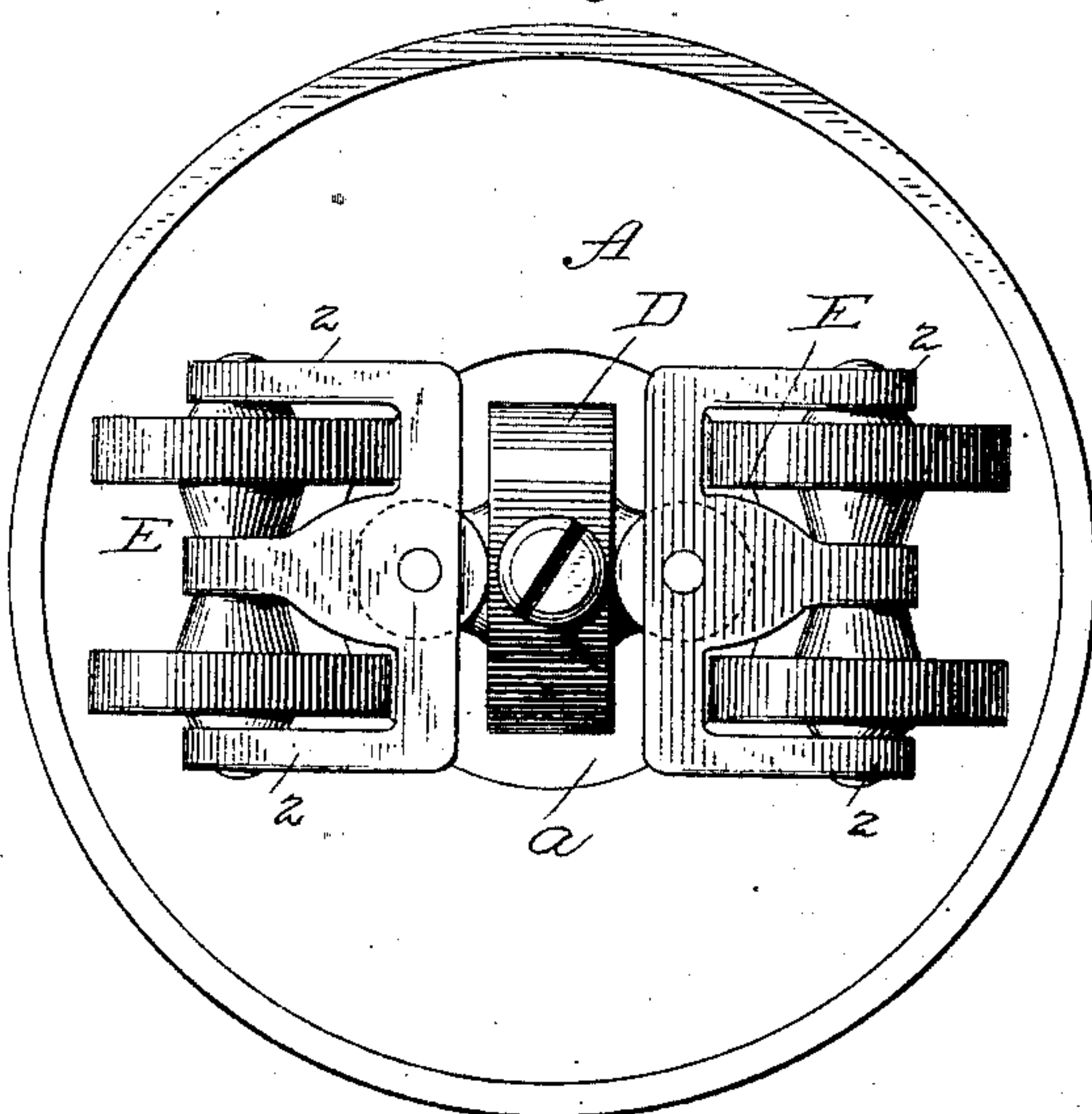
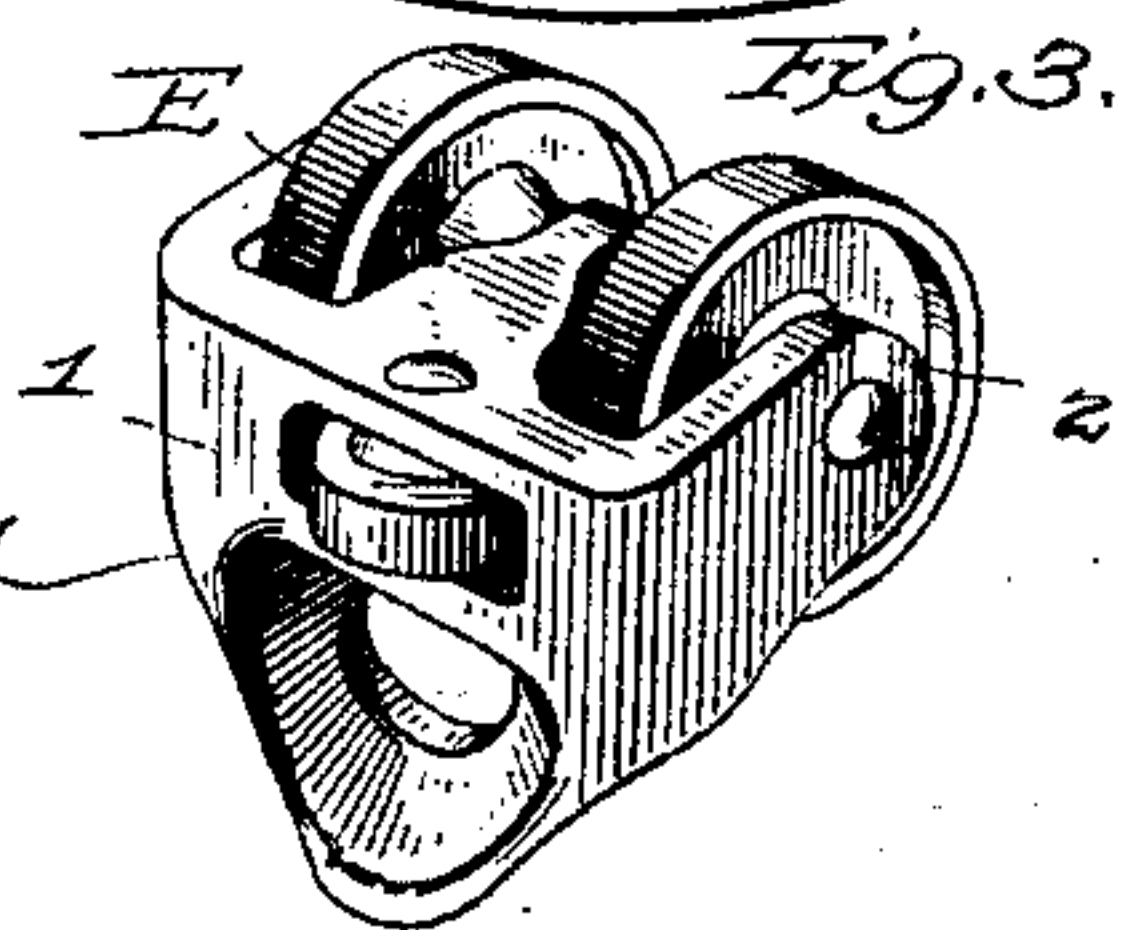


Fig. 3.



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UNITED STATES PATENT OFFICE.

ALBION P. BICKMORE, OF HYDE PARK, MASSACHUSETTS.

GIMBAL-JOINT.

SPECIFICATION forming part of Letters Patent No. 315,112, dated April 7, 1885.

Application filed September 18, 1884. (No model.)

To all whom it may concern:

Be it known that I, ALBION P. BICKMORE, of Hyde Park, in the county of Norfolk and State of Massachusetts, have invented a new and useful Improvement in Gimbal-Joints; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention is an improved gimbal-joint for use in connection with suspended berths on shipboard, or with any other article or structure requiring to be held in a horizontal or uniform position while the supporting-structure is shifting.

My object is to secure perfect freedom of movement in all directions in vertically-narrow space.

The invention consists in combining with a hemispherical or concave shell or shells a supporting-rod and supporting-truck having wheels or rollers adapted to bear in the inner concave surface, and to move freely in all directions.

It consists, further, in the special construction of the trucks.

In the accompanying drawings, Figure 1 represents in central vertical section the hemispherical shells, the trucks of the upper shell being shown in longitudinal section, while the mechanism of the lower shell is shown in a position a quarter-turn from that of the upper shell. Some of the parts are represented in side elevation. Fig. 2 is a plan view of the upper shell with its covering-plate removed. Fig. 3 is a perspective view of one of the trucks.

In these drawings, A A' represent hemispherical shells, of metal, adapted to be secured to disks B, which are attached one to the ceiling or other support and the other directly or indirectly to the article or structure which is to be supported. The bottoms or centers of the hemispherical shells are formed with round holes *a*, the edges being beveled outward. Inside the shells the surface is made smooth to receive the weight and facilitate the movement of the connecting mechanism. The direct connection between the two parts consists of a bolt, B', which passes through two disks, D D. As represented, there is a head on one end and a nut on the other of the bolt; but it may be connected to the disks in any convenient way. The disks have tapering studs *c* on each side, forming the journals for small trucks E E.

These trucks have backs 1. In the backs are holes approximately conical to fit the tapering studs and allow the trucks lateral or wabbling movement on the studs.

The trucks are placed back to back in the shell, with a disk, D, between each pair. A horizontal anti-friction roller is set in the back of each truck, adapted to bear against the disk D. On the face of the trucks are check-pieces 2, which support wheels that bear on the inner surface of the shell and support the weight. The truck is held to the stud by suitable screws, 3, and washer 4. Thus the trucks on each side of the disk are supported on the inner surface of the shell, and are prevented from tipping back against the disk by anti-friction rollers. The disk is suspended from these trucks by means of the studs *c*, and may swing freely in all directions, and be carried laterally by the movement of the truck over the concave surface, this movement changing the direction of the connecting-bolt by reason of the change in the inclination of the truck.

Obviously when the lower shell is carried from side to side in line with the studs of the disks the wheels of the trucks will run up and down upon the inner surface of the shells, allowing the connecting-bolts to move freely from side to side. When the lower disk is carried in line at right angles to the axis of the studs, they are simply rocked in their bearings in the trucks, the trucks adjusting themselves automatically. Every movement at any angle to these lines of movement above described will result in a compound movement of rocking of the studs and rolling of the trucks over the inner face of the shell. The weight is therefore supported upon wheels, which bear on a hemispherical shell, and are capable of automatic adjustment in all directions without change in height and without jar.

One shell and pair of trucks may be used alone; but of course the effect is doubled by the use of two, as shown, the two being exact duplicates.

I do not limit myself to the precise form of the trucks, nor to the exact hemispherical form of the shells.

I claim as my invention—

1. An improved gimbal-joint consisting of a concave shell having a central hole, a cen-

tral disk with a connecting-rod attached there-
to, and with studs, in combination with trucks
adapted to bear upon the inner surface of the
shell, the parts being arranged to operate all
5 substantially as described.

2. In combination with the concave shaft
having central hole, the disk D, and connect-
ing-rod, the studs on said disk, the trucks piv-
oted on said studs, anti-friction rollers in the
10 backs of the trucks bearing on the disk, and

wheels in the truck bearing on the concave
surface, all substantially as described.

In testimony whereof I have signed my name
to this specification in presence of two sub-
scribing witnesses.

ALBION P. BICKMORE.

Witnesses:

RUDOLPH DOORNINK,
HENRY GERACHTER.