

R. G. WINTER.
HINGE.

APPLICATION FILED JUNE 9, 1905.

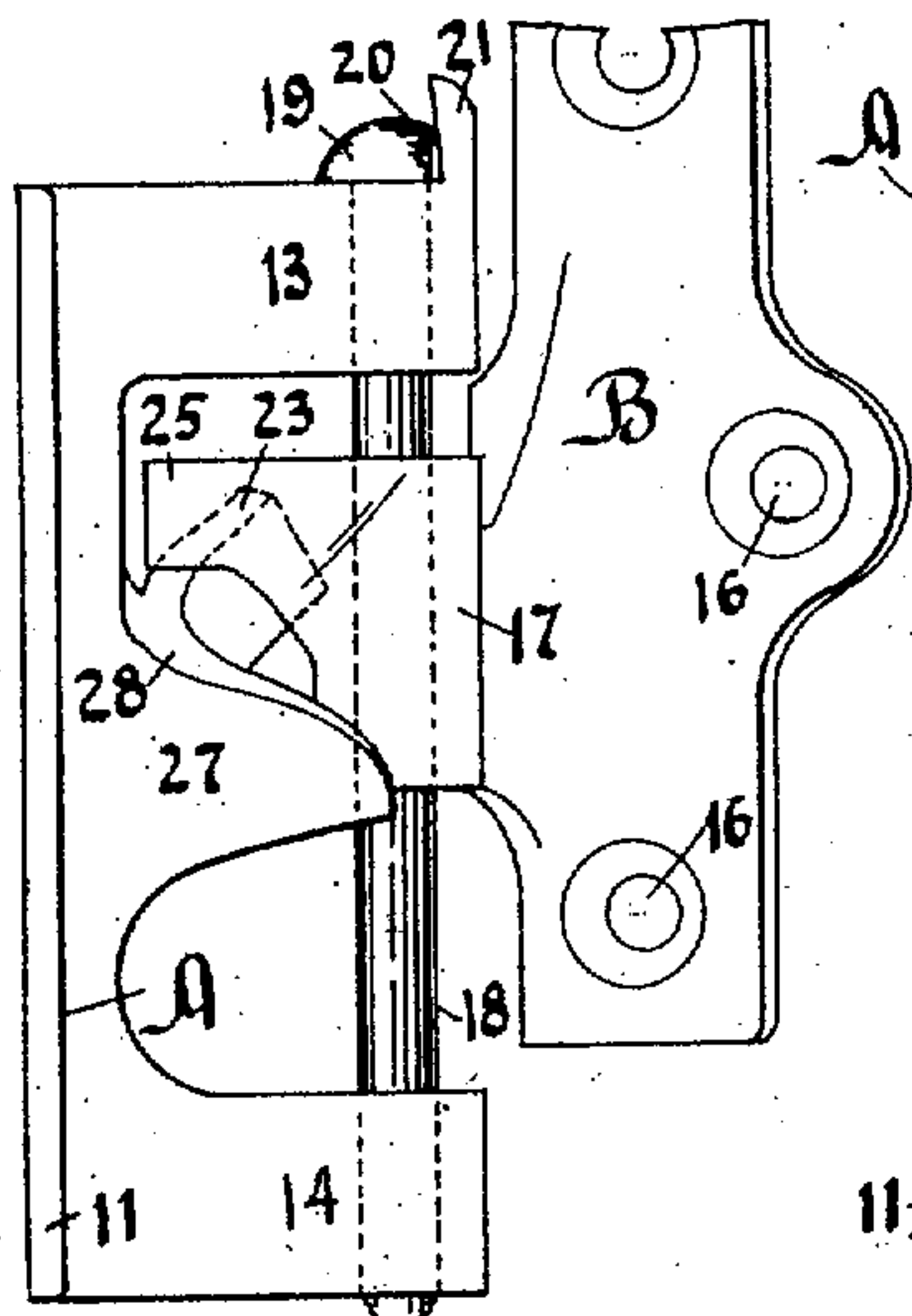


Fig. 3

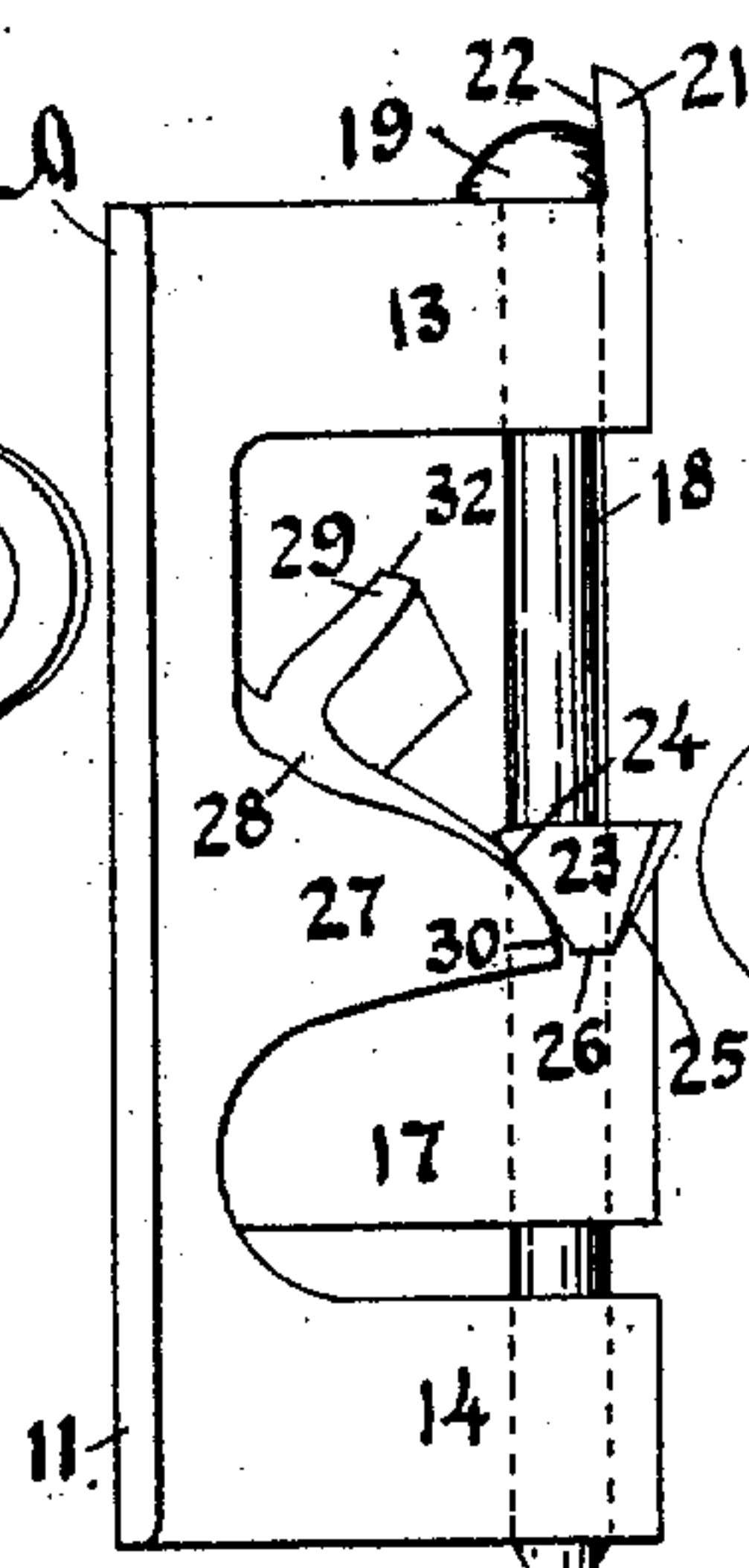


Fig. 2

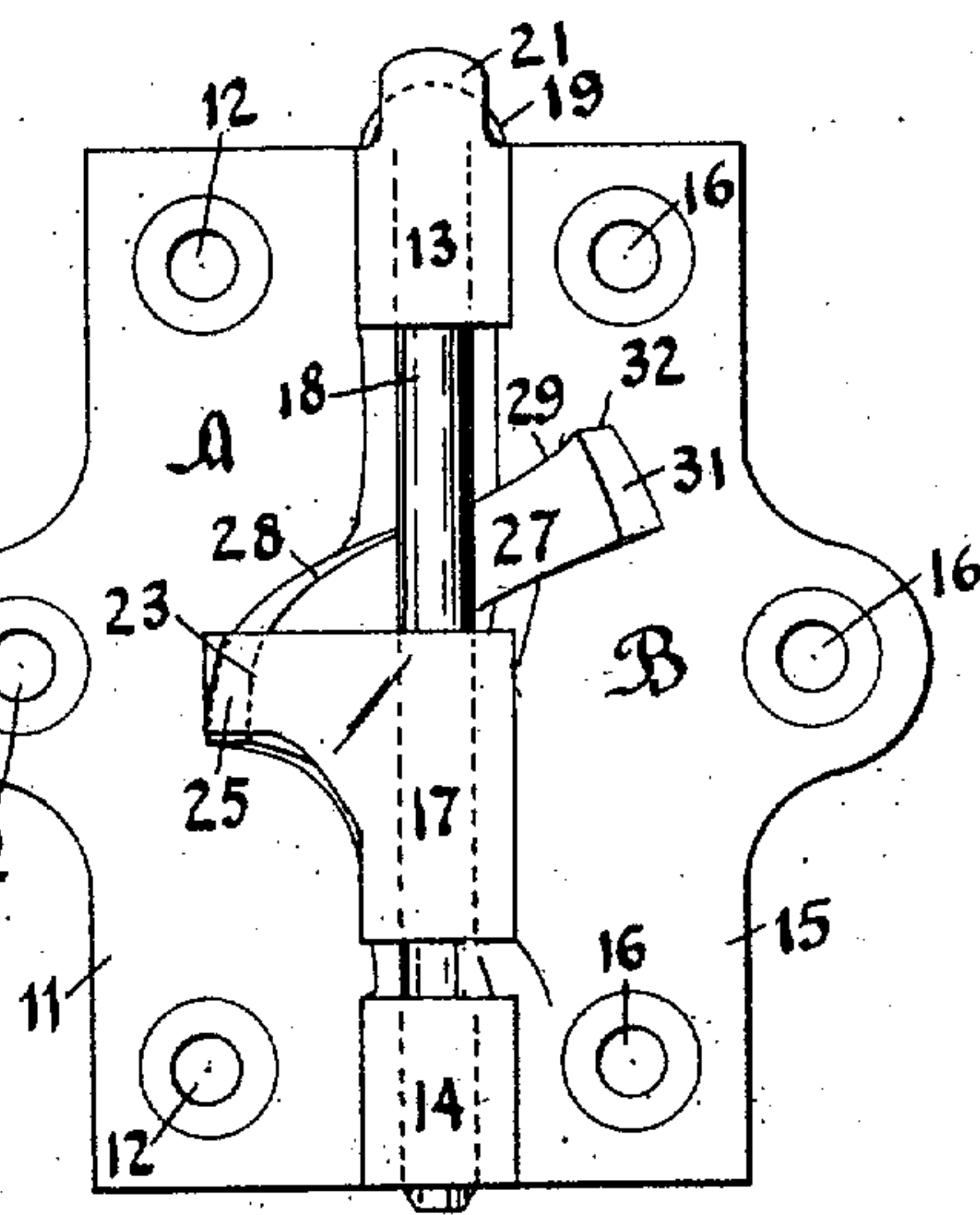


Fig. 1

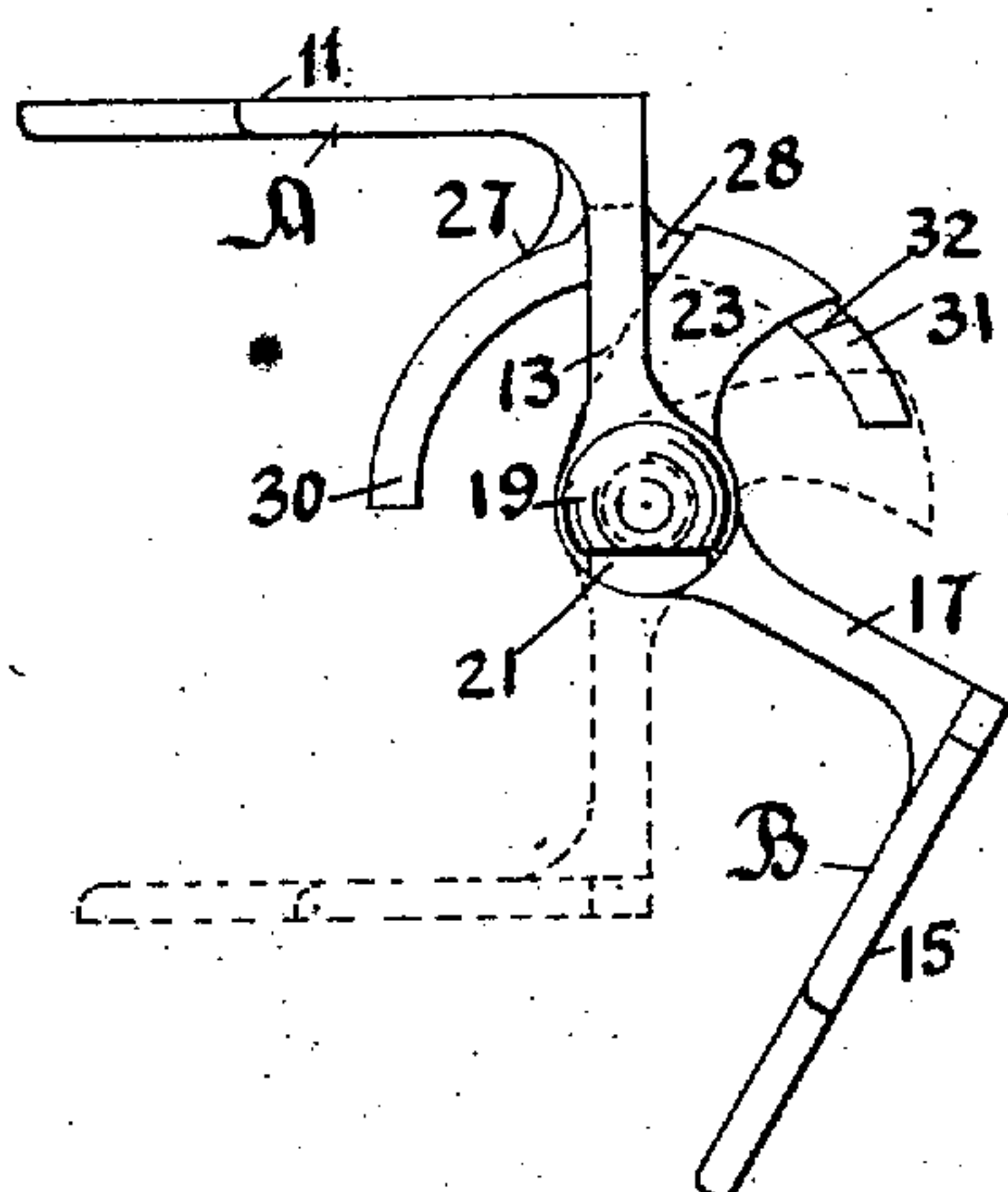


Fig. 5

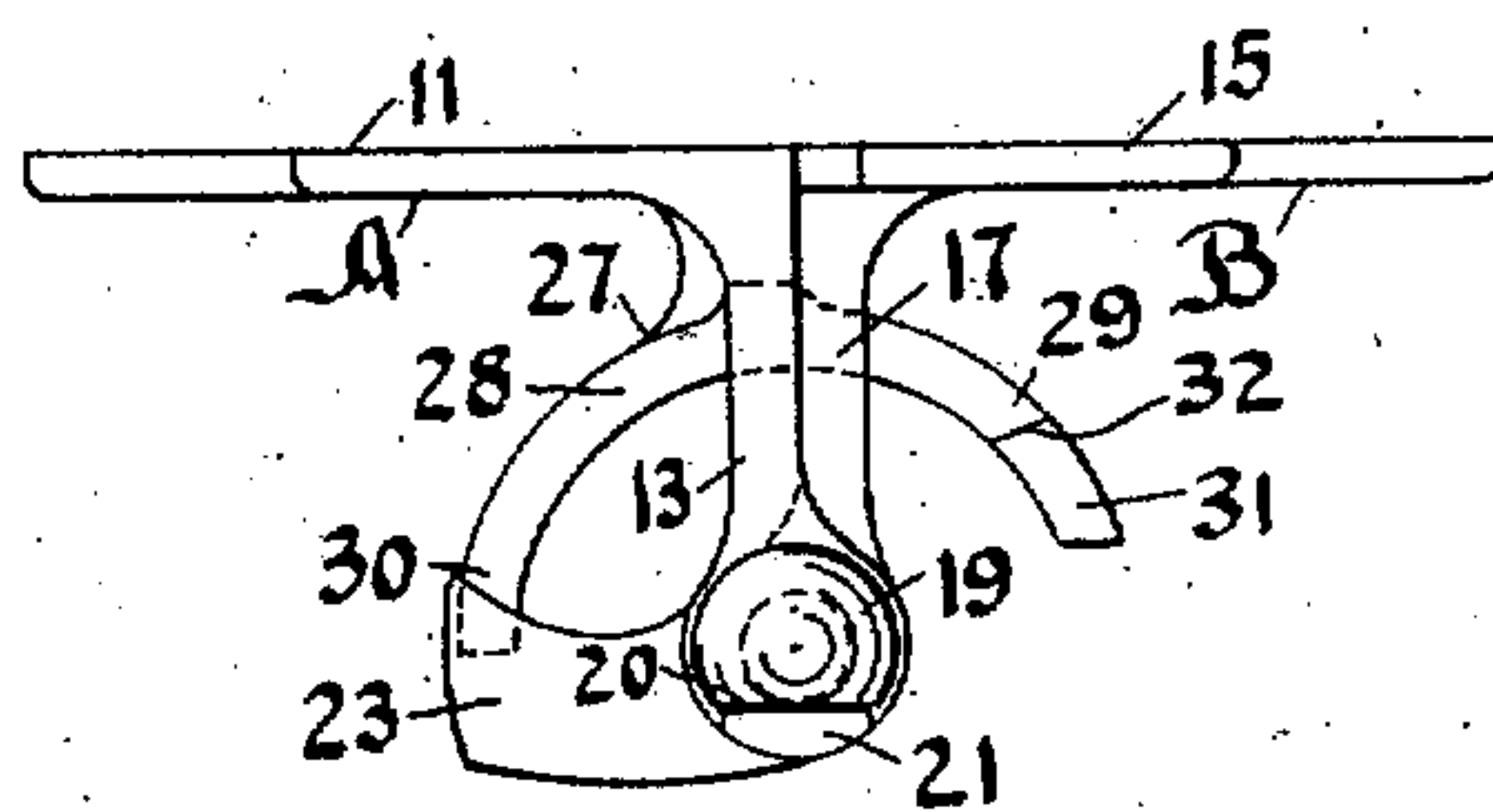


Fig. 4

Rudolph G. Winter, Inventor

Witnesses

Jos. M. Lumber.

Gertrude H. Poink

By *Georg Schmales*

Attorney

UNITED STATES PATENT OFFICE.

RUDOLPH G. WINTER, OF MILWAUKEE, WISCONSIN.

HINGE.

No. 883,998.

Specification of Letters Patent.

Patented April 7, 1908.

Application filed June 9, 1905. Serial No. 264,396.

To all whom it may concern:

Be it known that I, RUDOLPH G. WINTER, of Milwaukee, Wisconsin, have invented certain Improvements in Hinges, of which the following is a specification.

This invention is an improved form of the gravity hinge described and claimed in my Patent No. 785,143, granted March 21, 1905, and partly also as described in my concurrent application No. 255,897, filed April 17, 1905.

The object of my present invention is to construct the hinge so that it will run more easily and frictionlessly than the hinges previously invented, by so arranging the cam-surfaces that they shall be set apart at a distance from the pintle or pivot of the hinge, and in other ways as will be understood from the following description.

My invention consists of the construction and combinations hereinafter described and pointed out in the claims.

Referring to the drawings hereto annexed Figure 1 is a front elevation of a hinge embodying my improvements, in the closed position of the door to which it is attached, Fig. 2 is an elevation of the same in a plane at right angles to that of Fig. 1, Fig. 3 is a side view similar to Fig. 2 but showing the swinging leaf of the hinge opened through an angle of about 100 degrees. Figs. 4 and 5 are plan views of the same, the hinge being shown in a closed position and in a position of opening of about 120 degrees, respectively.

In these drawings every reference character designates always the same part.

In the form of hinge shown there are two leaves A and B, of which in the position shown the leaf A is fixed and the leaf B attached to the door, but by reversing the position of the hinge the leaf A might be attached to the door and the leaf B fixed. The leaf A comprises a plate 11 having screw-holes 12 for attachment to the face of the door-jamb, and a pair of pintle lugs 13, 14 projecting at right angles thereto at top and bottom. The leaf B is likewise comprised of a plate 15 having screw-holes 16 for attachment to the face of the door and a single central pintle-lug 17. The pintle-lugs 13, 14 and 17 are connected by the pintle 18 of the hinge, which passes through perforations therein as usual. This pintle has its head 19 flattened at one side as shown at 20, and a projection 21 projects upwardly from the pintle-lug 13 against the flat portion 20 to

prevent the pintle from turning in its socket with respect to the fixed leaf A. The projection 21 on its flat side 22 is preferably somewhat undercut as shown, to prevent the pintle from rising when the door is opened. As will be observed the lug 17 does not fill the entire space between the lugs 13 and 14, but moves up and down between them, and is provided in the first form of the hinge with a radially projecting cam-lug 23, this lug having preferably a trapezoidal cross-section, as seen from Fig. 2, composed of two downwardly and inwardly sloping faces 24 and 25, and a horizontal face 26. The leaf A, on the other hand, has between the lugs 13 and 14 and partly surrounding the lug 17, a semi-circular lug 27 having an upwardly sloping and generally helicoidal cam-surface 28 on which the lug 23 rests. I prefer to make this cam-surface not of a uniform slope, but at its upper end 29 more steeply pitched than below, and likewise at its lower end 30, whereon the lug 23 rests in the closed position of the door. Beyond the end of the cam-surface 28 there is preferably formed on the lug 27 another cam-surface 31, which is steeply pitched in the opposite direction, and which coacts with the surface 25 of the lug 23.

This hinge operates as follows: When the door is opened the lug 23 rises on the cam-surface 28 raising the swinging leaf B and the door with it. Should the door be released before the lug 23 reaches the top of the cam-surface, the steeper portion 29 will give an increased acceleration to the door as it starts to close, and likewise, should the door be released when opened only a few inches the increased pitch of the part 30 of the cam-surface will act with sufficient force to close the door. Again, should it be desired to have the door remain in an open position, the door is opened until the horizontal portion 26 of the lug 23 rests on the top edge 32 of the lug 27, in which case there is no tendency either to open or close the door; and should it be desired to hold the door open positively, it is swung still further until the lug 23 rests on the surface 31, in which case the door is swung wide open and held in that position until forcibly closed.

The form of hinge shown herein offers superior advantages over those shown in my former applications principally on account of the greater ease of operation. By reason of the cooperating surfaces being placed at a

distance from the pintle, the turning force exerted by the hinge is greater with a given slope by reason of the longer lever-arm, and therefore, a smaller slope is necessary to accomplish the same effect, and conversely a greater effect can be produced to open or shut the door with the available amount of slope. In previous forms of hinge it was necessary to make the slope of the surface so great that it approached the angle of repose of the rubbing surfaces, so that the amount of friction and consequently the strain upon the hinges was very great in opening the door, and the rotating effect was less in shutting. When the cam-surfaces are set at a distance from the pintle as herein, slight irregularities or lack of smoothness of the surfaces are of less importance, and the smoothness of operation is increased in much more than a simple proportion.

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

1. In a hinge, the combination of a pair of leaves, a pintle pivotally connecting them and having a head one side of which is cut away to form a flat side, and a projection on one of said leaves opposite said flat side, whereby the pintle is prevented from rotating with the opposite leaf.

2. In a hinge, the combination of a pair of leaves, a pintle pivotally connecting them and having a head one side of which is cut away to form a flat side, and a projection having an overhanging surface on one hinge-leaf opposite said flat side, and adapted to prevent the other from rotating the pintle and to restrain it from rising vertically.

3. In a gravity-acting hinge, the combination of a pintle having a head and a flat side formed on one side thereof, a pintle-lug in which said pintle is mounted, and a projection on the outer side of said lug projecting against the flat side on said head.

4. A door-hinge comprising, in combination, a pair of leaves each having a flat portion provided with means for securing it to the flat side of the door or door-jamb, one of said leaves having on the upper and lower ends thereof pintle-lugs projecting outwardly at right angles to said flat portion and perforated to receive a pintle, the other leaf having

on one edge in the center thereof a single pintle-lug projecting at right angles to said flat portion and also perforated to receive the pintle, a pintle passing through said lugs forming a pivot for the two leaves, a semicircularly curved cam-lug on said first named hinge-leaf between the two pintle-lugs thereof and substantially bisected by the plane thereof, said cam-lug having a continuous helicoidal cam-surface, the end portions of which are pitched more steeply than the intermediate portion, and a projection or lug on the pintle-lug of the other hinge-leaf substantially at right angles to said pintle-lug, whereby it rests on the lower portion of said cam-surface when the two hinge-leaves are closed together.

5. A door-hinge comprising, in combination, a pair of leaves each having a flat portion provided with means for securing it to the flat side of the door or door-jamb, one of said leaves having on the upper and lower ends thereof pintle-lugs projecting outwardly at right angles to said flat portion and perforated to receive a pintle, the other leaf having on one edge in the center thereof a single pintle-lug projecting at right angles to said flat portion and also perforated to receive the pintle, a pintle passing through said lugs forming a pivot for the two leaves, a semicircularly curved cam-lug on said first named hinge-leaf between the two pintle-lugs thereof and substantially bisected by the plane thereof, said cam-lug having a continuous helicoidal cam-surface, the end portions of which are pitched more steeply than the intermediate portion, and a projection or lug on the pintle-lug of the other hinge leaf at right angles to said pintle-lug whereby it rests on the lower portion of said cam-surface when the two hinge leaves are closed together; the upper portion of said semicircular lug having at its free end a downwardly sloping surface in position for the other lug to rest thereon in the wide open position of the hinge.

In testimony whereof, I have hereunto set my hand this seventh day of June, 1905.

RUDOLPH G. WINTER.

In presence of—

GERTRUDE H. BOINK,

GEORGE WETMORE COLLES.