

No. 689,236.

Patented Dec. 17, 1901.

A. H. SHOCK.

CASTER.

(Application filed Jan. 19, 1901.)

(No Model.)

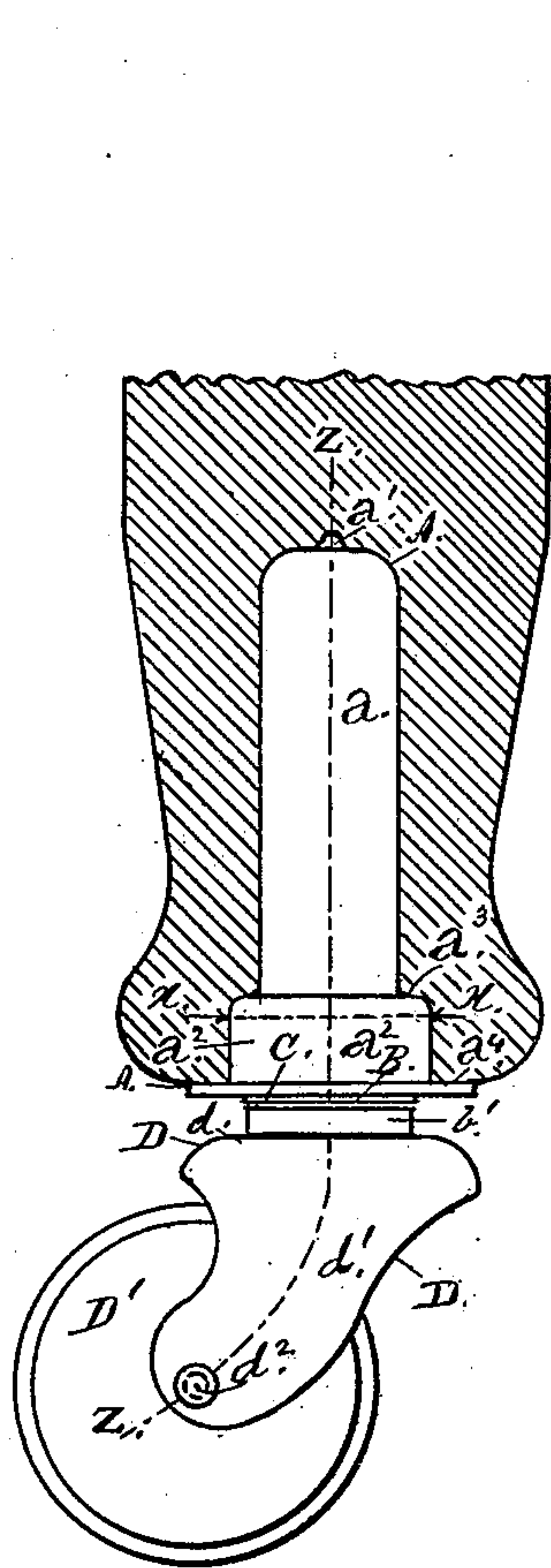


Fig. 2.

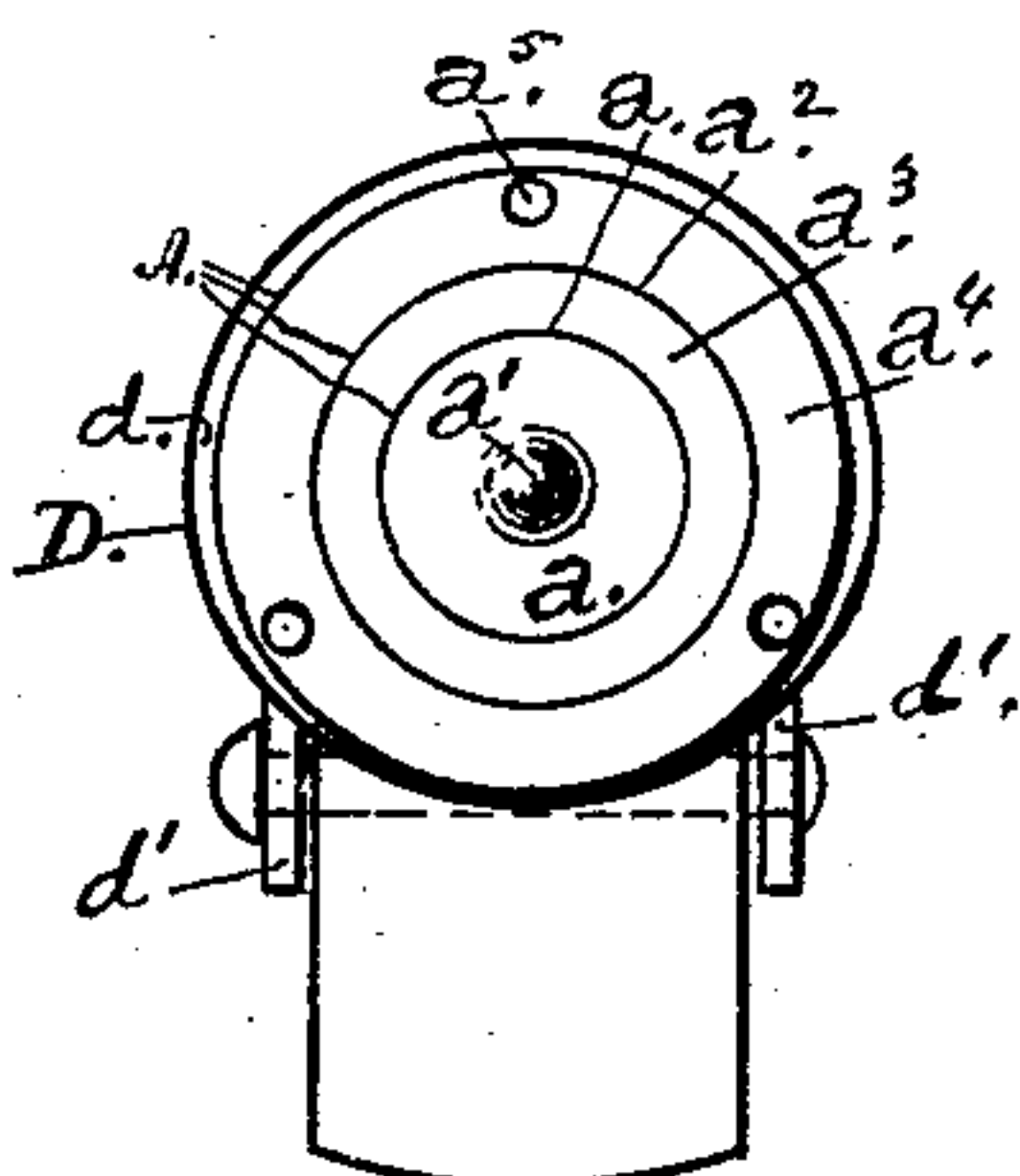


Fig. 1.

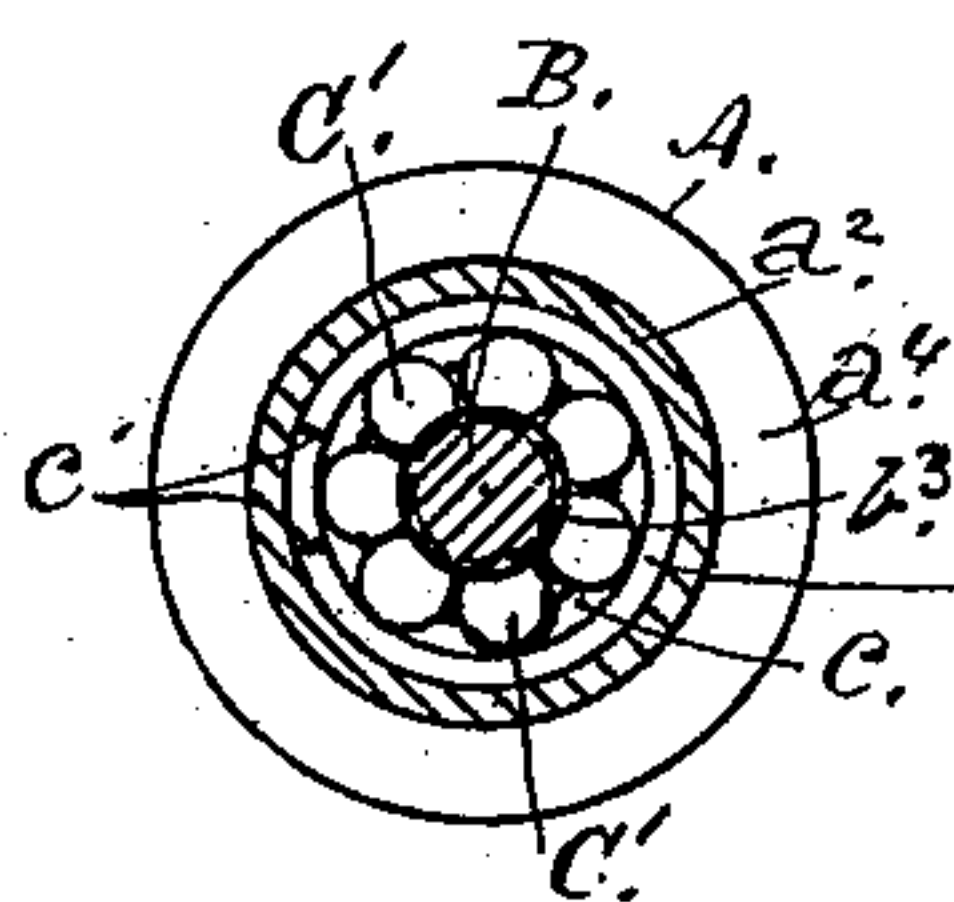


Fig. 4.

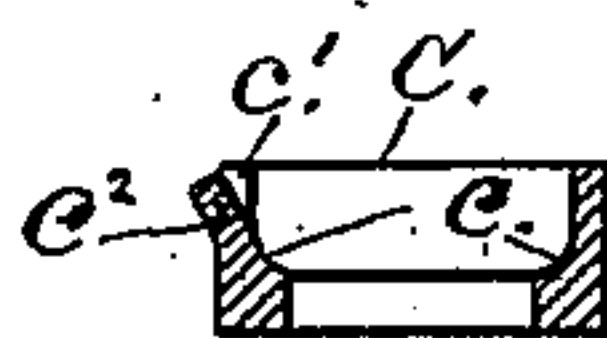


Fig. 8.

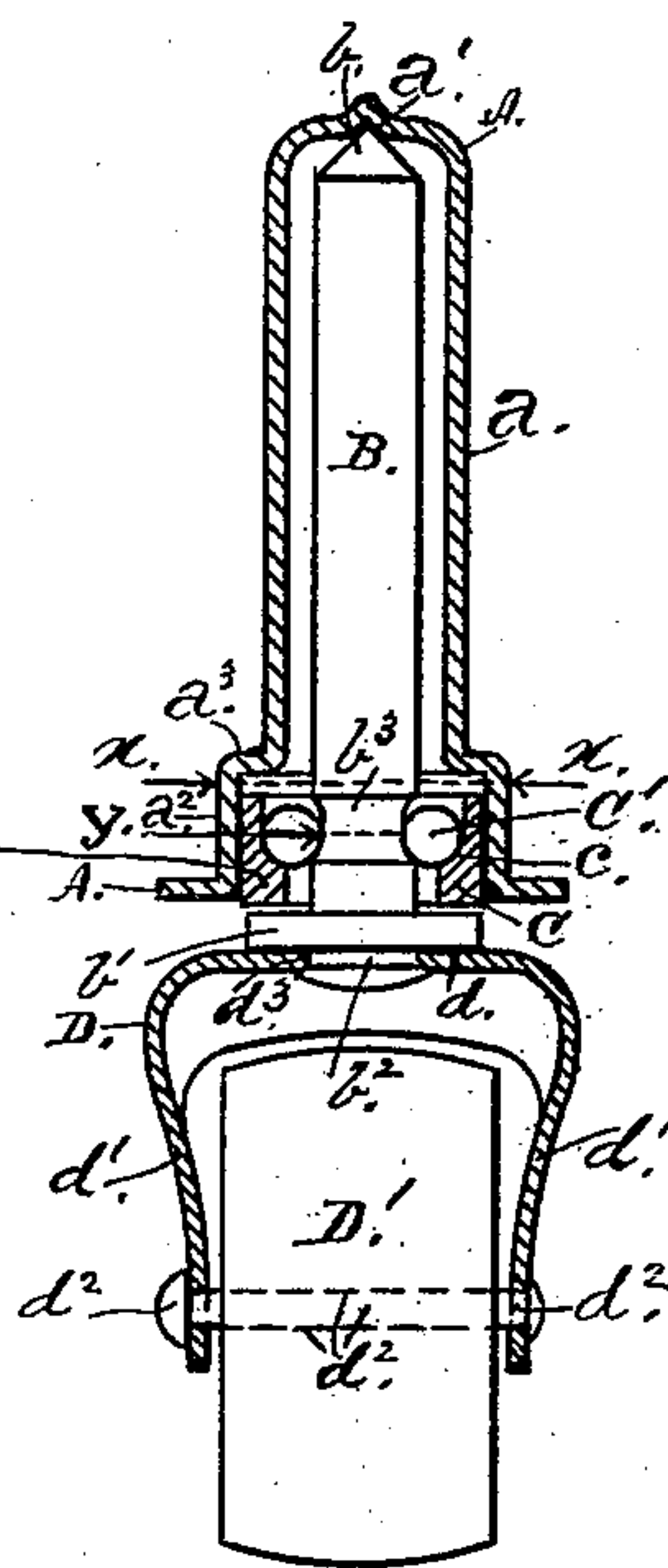


Fig. 3.

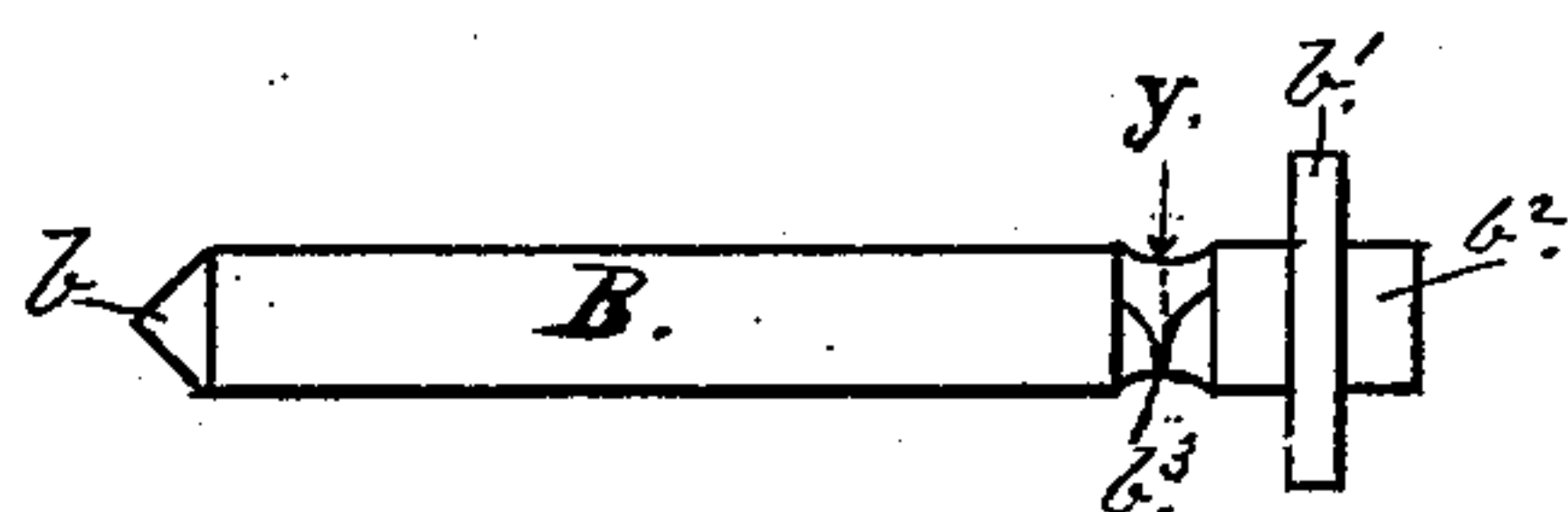


Fig. 5.

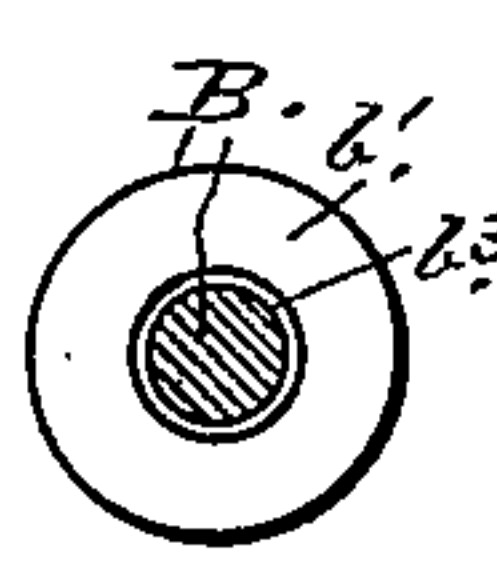


Fig. 6.

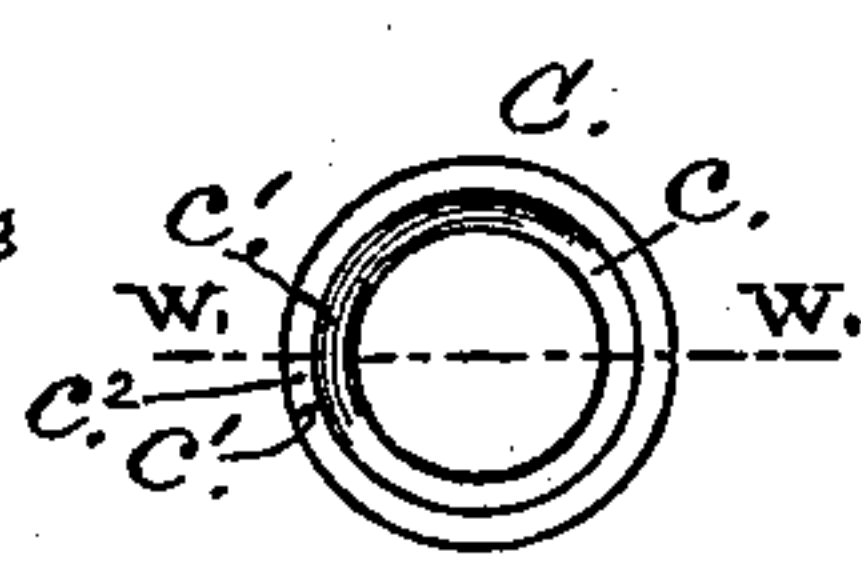


Fig. 7.

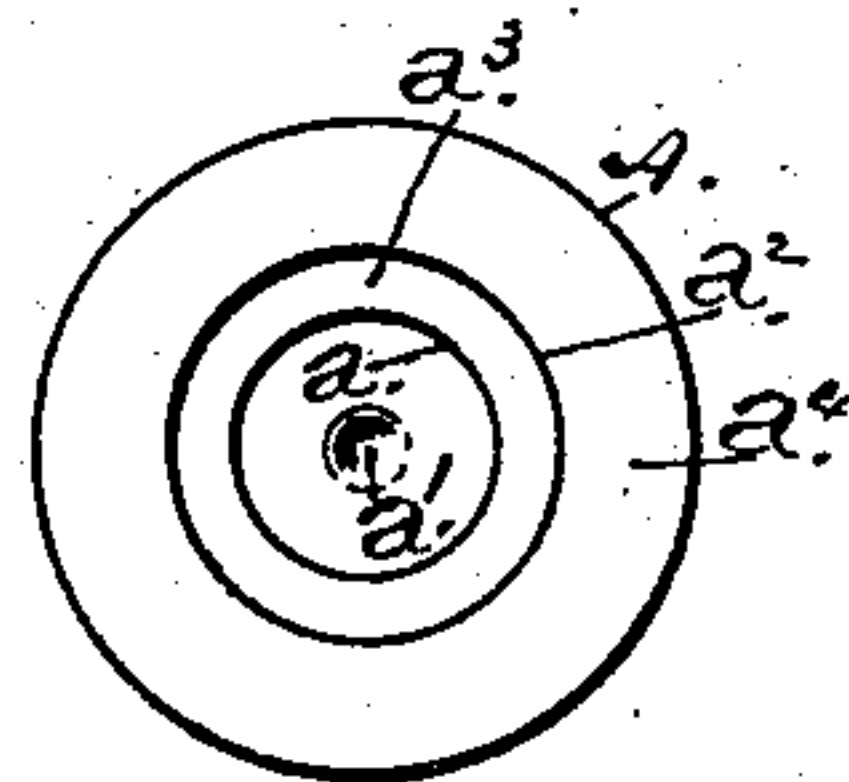


Fig. 9.

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# UNITED STATES PATENT OFFICE.

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## CASTER.

SPECIFICATION forming part of Letters Patent No. 689,236, dated December 17, 1901.

Application filed January 19, 1901. Serial No. 43,858. (No model.)

*To all whom it may concern:*

Be it known that I, ABRAHAM H. SHOCK, a citizen of the United States, residing at Lancaster, in the county of Lancaster and State of Pennsylvania, have invented certain new and useful Improvements in Swivel-Casters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in a swivel-caster of that class in which the spindle or shaft, with the bifurcated jaw or two-eared yoke carrying the roller or pulley at one end thereof, is arranged within a tubular socket adapted to be secured in the usual way to an article of furniture in connection with which the caster is used, in which the spindle is conically pointed at one end thereof and seated in a conical recess formed within and at the center of the closed end of the socket, in which the open end of the socket is preferably provided with a widened cylindrical portion, and in which is arranged a ring of balls surrounding the spindle and seated in a ball-race adjacent to the lower end of a ferrule which is seated with a close frictional contact in the open end of said socket.

The object of the invention is the construction or production of a swivel-caster that will readily turn in any desired direction, in which friction and cost of production are reduced to a minimum, and in which provision is made to hold the roller spindle or shaft in place when the article having the caster is lifted or raised.

The invention consists in the arrangement and combination of certain elements, which will severally and at large appear in the following description, and they will be separately and combinedly set forth or pointed out in the appended claims.

The purposes of the invention are attained by the mechanism, devices, and means illustrated in the accompanying drawings, similar reference characters designating like parts throughout the several views, in which—

Figure 1 is a top plan of a swivel-caster embodying the elements of the invention; Fig. 2, a full side elevation of the same inserted into the lower end of a table-leg, a portion

of which appears in vertical section: Fig. 3, a vertical section taken on the line  $z z$  in Fig. 2 and viewed from the left, the spindle, roller and journal-pin showing entire; Fig. 4, a sectional plan taken on the line  $x x$  in Figs. 2 and 3 and viewed from above with the roller and yoke omitted; Fig. 5, a detached side view of the caster-spindle; Fig. 6, a cross-sectional view of the spindle, taken on the line  $y y$  in Figs. 3 and 5 showing a surrounding shoulder or collar; Fig. 7, a detached plan of the ball-retaining the race ferrule, showing cuts through one side thereof; Fig. 8, a sectional elevation of the ferrule, taken on the line  $w w$  in Fig. 7, with the upper end of the strip between the cuts slightly outwardly turned; and Fig. 9 an inverted detached plan of the socket member.

In the drawings, A designates a tubular body having a portion  $a$ , of approved dimensions, with one end closed, and having within, at the center thereof, a conical recess  $a'$ , with the other end open, and preferably provided with a diametrically-extended portion  $a^2$ , also of approved dimensions, forming between the two an abrupt shoulder or offset  $a^3$  (but this offset may be varied or omitted when the conditions require) and having at its open end or mouth an outwardly-projecting ring-flange  $a^4$ , which is shown to be flat or level, with orifices  $a^5$  through the body thereof; but these may be omitted and the flange may have any other shape or form as the conditions may require, and its upper surface may be provided with upwardly-projecting teats or points, as by prick-punching. The hollow or interior of this tubular body constitutes the tubular socket referred to in the opening paragraph hereto, while said body may be made of molten metal and cast in a matrix; but it is preferably punched and drawn from selected sheet metal, and its dimensions and shape will vary according to the construction thereof and the nature of the article to which the caster is applied for use. Within the socket, axially rotatable therein, is arranged a stem or shaft B of the required dimensions, said shaft having one end thereof made conical with its apex or point  $b$ , of which only the extreme end is seated in said recess  $a'$ , reducing friction to a minimum at this point, and having adjacent to its other end a surrounding flange or



collar  $b'$ , leaving a projecting end or stud  $b^2$ , while the body of the shaft, at a prescribed point above the collar, has formed therein a shallow groove  $b^3$ , of prescribed width, constituting a ball-race about said body. Arranged about the groove  $b^3$  of the shaft and firmly seated by close frictional contact in the open or widened portion  $a^2$  of the socket member is a ferrule C, having interiorly a ball-race  $c$  adjacent to the lower edge or open end thereof, said ball-race registering with the lower edge of said groove and forming therewith an open passage-way about said shaft, or a ball-race partially situated in each. In said race are loosely seated a ring or series of balls  $C'$ , constituting an antifric-

tion-bearing between the two—said shaft and ferrule. The ferrule through its upper edge is longitudinally provided with inwardly-approaching cuts  $c'$ , forming a resilient strip or tongue  $c^2$  in one side thereof, shown as being slightly outwardly turned or sprung in Fig. 8, allowing the balls to be readily inserted into or removed from the race or open passage-way before mentioned when the ferrule has been applied to the shaft before its insertion into the socket and by reason of the resiliency thereof said tongue again snapping back into place after said balls are seated, and by reason of the firm seating of the ferrule into the open end or the portion  $a^2$  of the socketed member said series of balls serve to hold the spindle or caster shaft centrally in place, preventing all liability of its contacting with the inner surface or wall of the socket, as well as its dropping or falling therefrom, when the article having had the socketed member inserted is raised or lifted.

It will here be remarked that the bifurcated jaw or the two-eared yoke D, mentioned in the opening paragraph hereto, having a plate  $d$ , with its side arms or ears  $d'$   $d'$ , and a roller or pulley  $D'$  pivoted therebetween by an end-riveted axle-pin  $d^2$ , as well as the stud  $b^2$ , passing through an aperture  $d^3$  of said plate and riveted thereon, as shown, rigidly securing the two together, are all old and well known to the trade and they are only introduced here as elements necessary to complete the construction of the caster.

Now the several parts having been described and occupying the respective positions indicated in the drawings, the following observations will be noted: first, that when the caster is applied to use the weight of the article into which its socketed member has been inserted is supported entirely on the spindle end, which is seated in the recess of the closed end of said member; second, that this spindle end being conically pointed and the recess into which this pointed end is seated being proportionately shallow the friction at this point of support is reduced to a minimum; third, that by reason of a series of balls surrounding the spindle near the lower end thereof friction is reduced to a minimum

at this point; fourth, that said balls being partially seated in the groove around the spindle and in the interior ball-race adjacent to the lower end of the surrounding ferrule said spindle is held centrally and upwardly in place, and, fifth, that said ferrule being firmly seated in the lower or open end of the socketed member the spindle is kept centrally in place and prevented from having any lateral contact with the socket-surface of said member.

The invention having been thus ascertained and described and the manner in which it is performed fully shown and set forth, what is considered new, and desired to be secured by Letters Patent, is—

1. A caster comprising: a socketed member, having an upper closed end, and a lower open end, with a shallow conical recess arranged within and at the center of said closed end, said member adapted to be inserted into the base or foot of an article of household or other furniture; a revoluble shaft arranged within the socket of said member, said shaft having a cone-pointed upper end seated in said conical recess, and a shoulder or collar adjacent to the lower end thereof, with a projecting end below the collar, and a ball-race above the collar and recessed into the body of the shaft; a ferrule surrounding the shaft and firmly seated in the open end of said socketed member, said ferrule having an interior ball-race adjacent to the lower end thereof and registering with the lower edge of the ball-race of the shaft, with a series or ring of balls partially seated in each race; and a two-eared yoke with the top plate thereof rigidly secured to the projecting end of the shaft, and a roller pivoted between the ears of said yoke; all substantially as described and for the purpose hereinbefore set forth.

2. In a caster of the character described, the combination with a socketed member, A, having the portion,  $a$ , with the closed upper end and the conical recess,  $a'$ , within and at the center thereof, and the widened portion,  $a^2$ , integral with its open end, with the shoulder,  $a^3$ , between the portions, and the surrounding ring-flange,  $a^4$ , projecting from the open end of said widened portion; and a revoluble shaft, B, having the upper conical end with the apex,  $b$ , seated in said recess,  $a'$ , and the surrounding shoulder or collar,  $b'$ , adjacent to the lower end, with the projecting end or lug,  $b^2$ , below and the recessed groove,  $b^3$ , above said collar; of a ferrule, C, surrounding said shaft and seated in said widened portion,  $a^2$ , said ferrule having the inside lower end ball-race,  $c$ , and the upper end inwardly approaching longitudinal cuts,  $c'$ , with the upwardly-extending resilient tongue,  $c^2$ , between said cuts, and a series of balls seated in said ball-race,  $c$ , and in said groove,  $b^3$ ; all substantially as and for the purpose hereinbefore set forth.

3. The combination in a caster of the character described, with a tubular-socketed mem-



ber, A, adapted to be inserted into the base  
or foot of an article of household or other  
furniture, and a revoluble shaft, B, arranged  
within the socket of said member, said shaft  
5 having an upper end conical apex,  $b$ , a sur-  
rounding collar,  $b'$ , a lower end projecting  
lug,  $b^2$ , and a surrounding groove,  $b^3$ , above  
said collar, and a ferrule, C, surrounding the  
shaft and firmly seated in the open end of  
10 said socket, said ferrule having a lower end  
interior ball-race,  $c$ , registering with the lower  
edge of said groove,  $b^3$ , and on one side there-

of upper end inwardly-approaching cuts,  $c'$ ,  
with a resilient tongue,  $c^2$ , between said cuts,  
of a ring of balls,  $C'$ , partially seated in the 15  
race,  $c$ , of the ferrule and partially in the  
groove,  $b^3$ , of the shaft, all substantially as  
and for the purpose hereinbefore set forth.

In testimony whereof I affix my signature in  
presence of two witnesses.

ABRAHAM H. SHOCK.

Witnesses:

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