

(No Model.)

S. C. MENDENHALL.

CASTER.

No. 314,966.

Patented Mar. 31, 1885.

FIG. I.

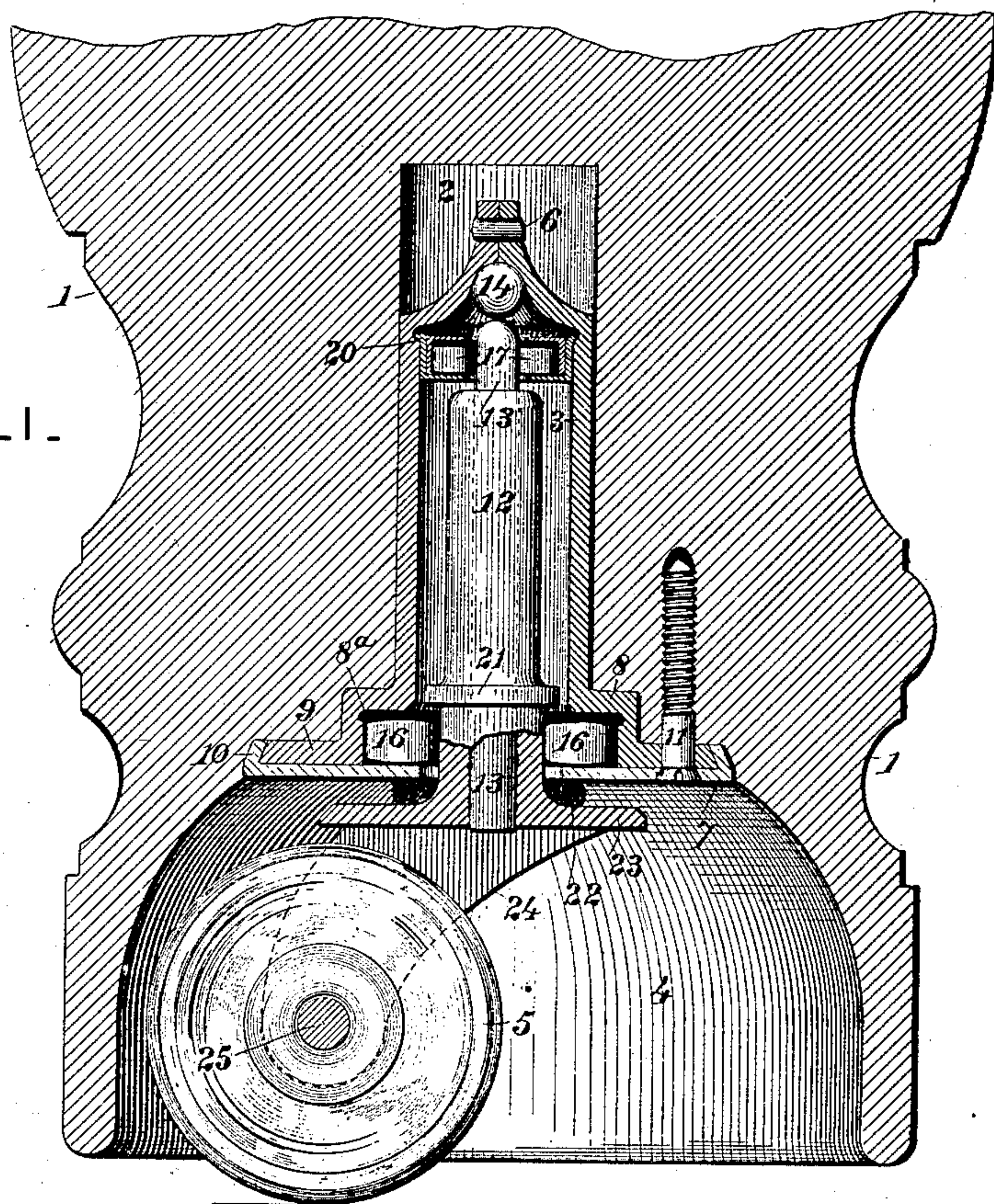


FIG. II.

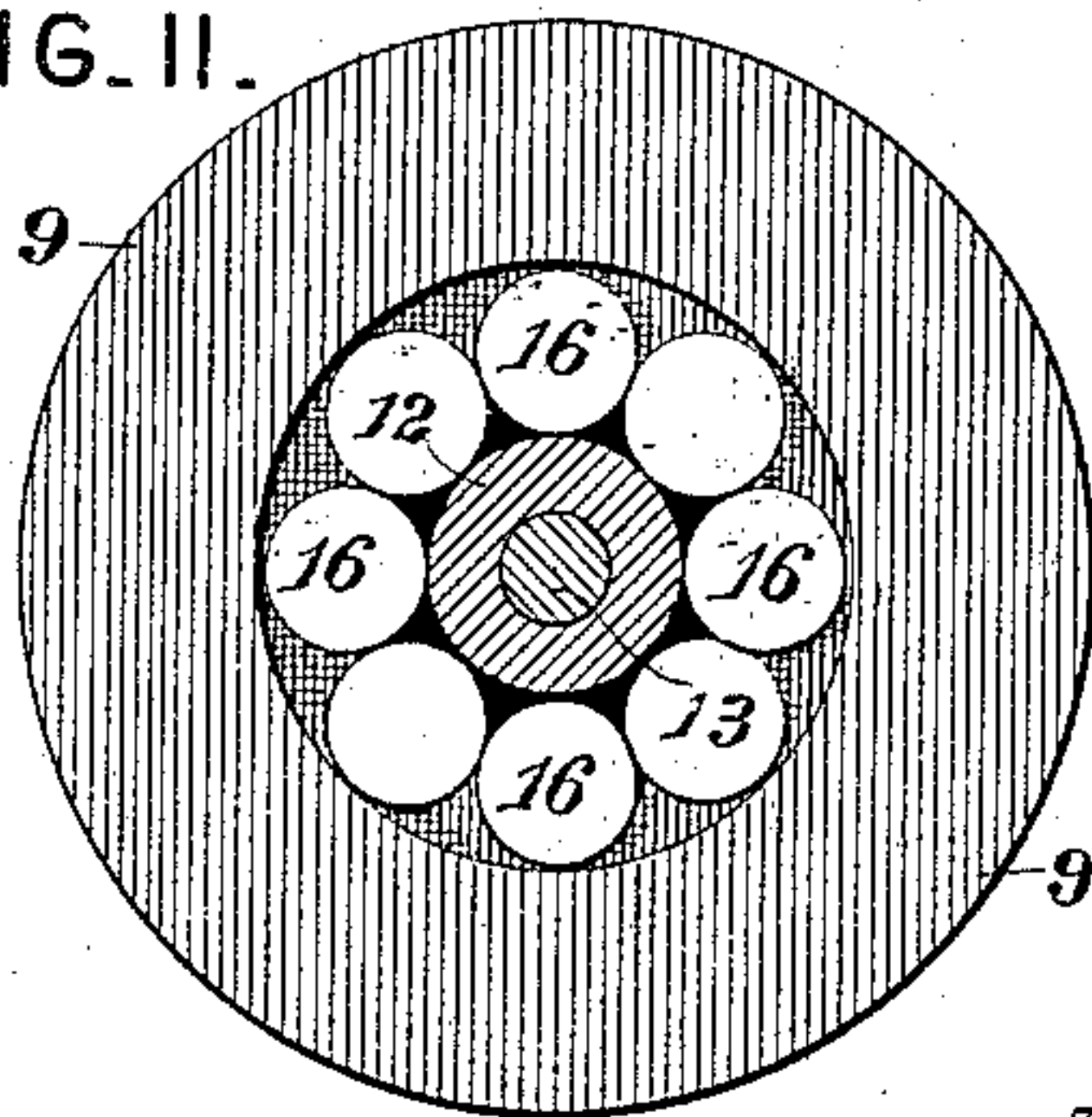


FIG. III.

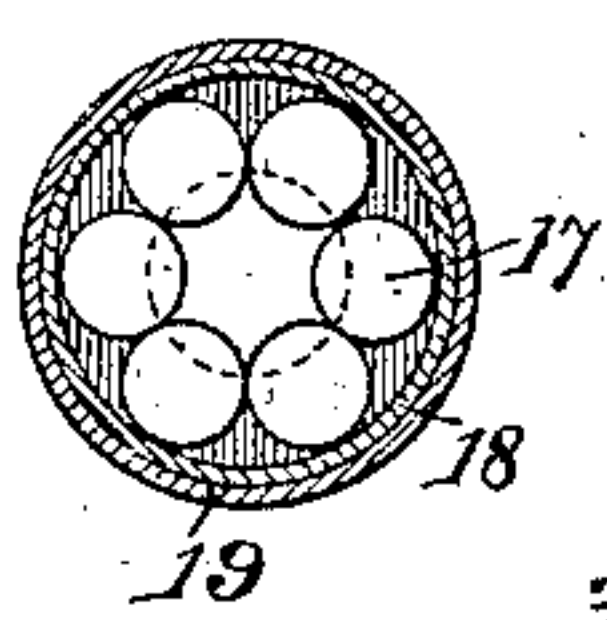


FIG. IV.

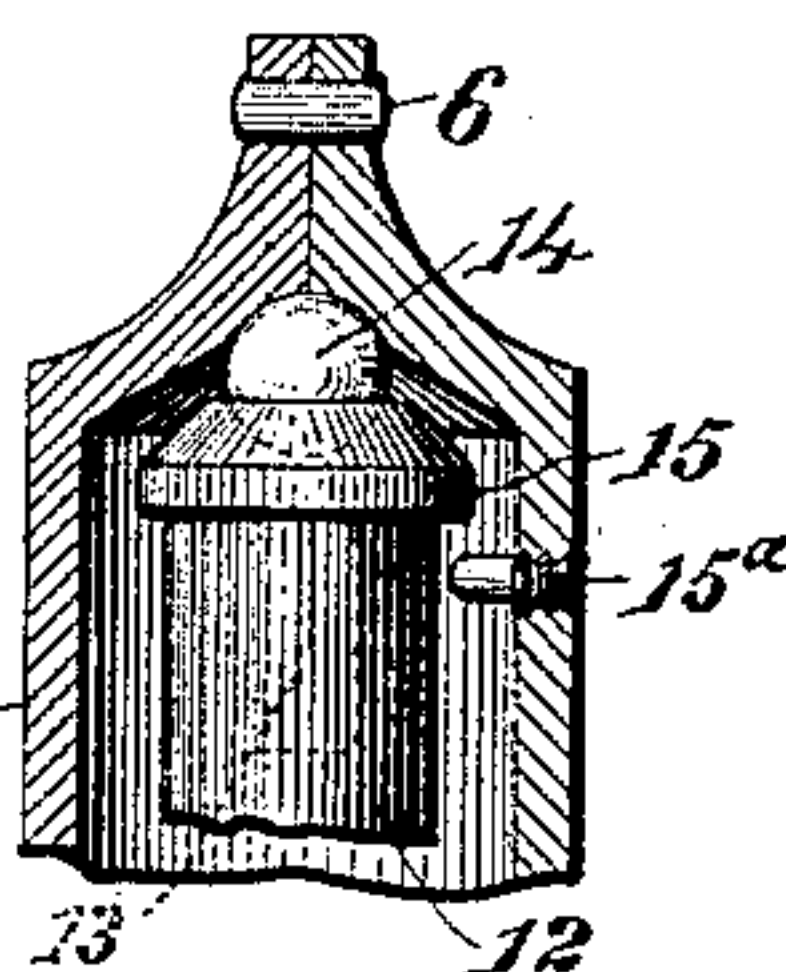


FIG. V.

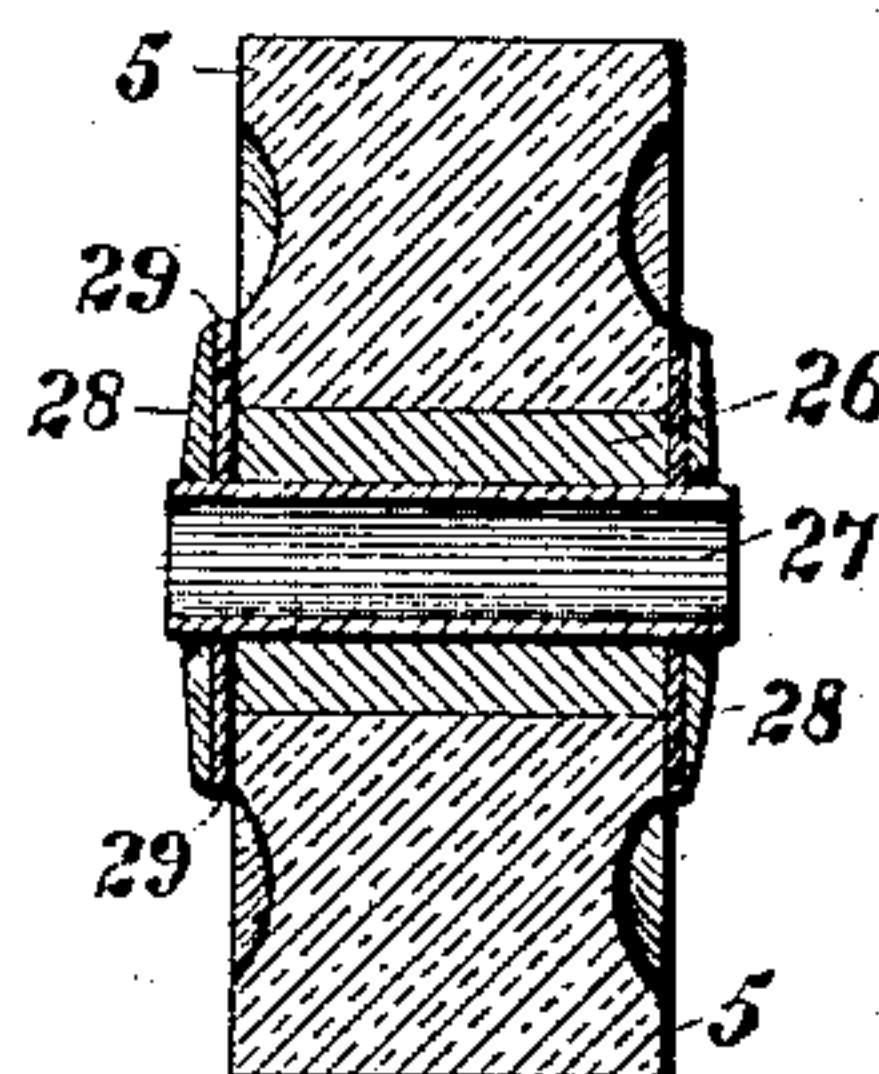


FIG. VI.

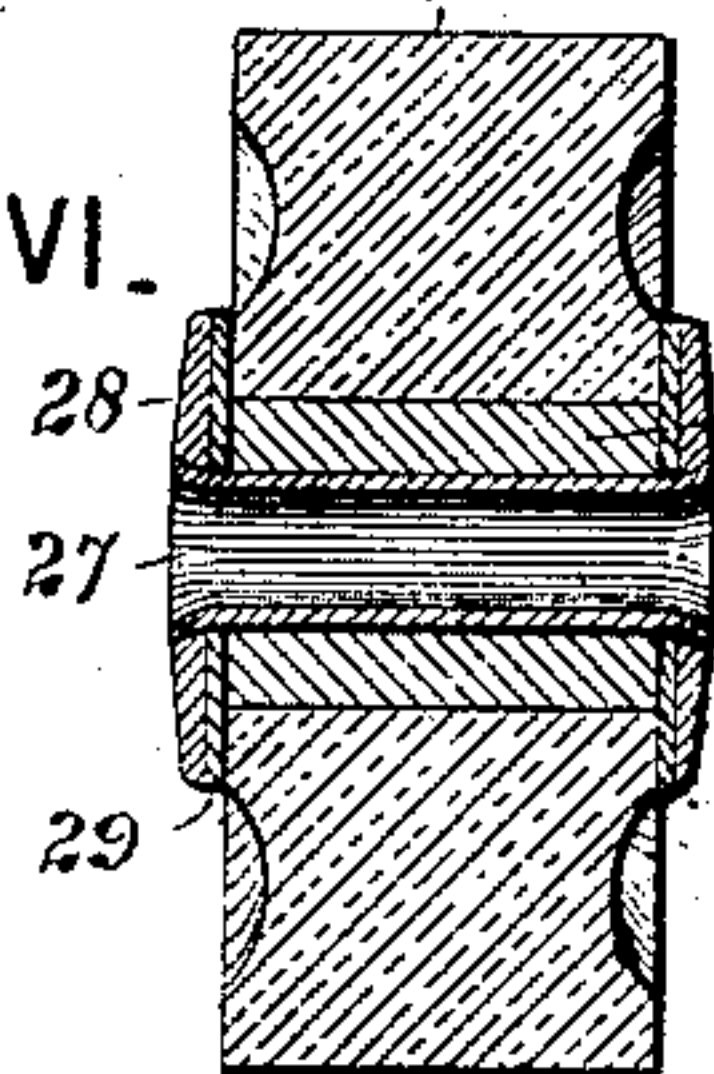
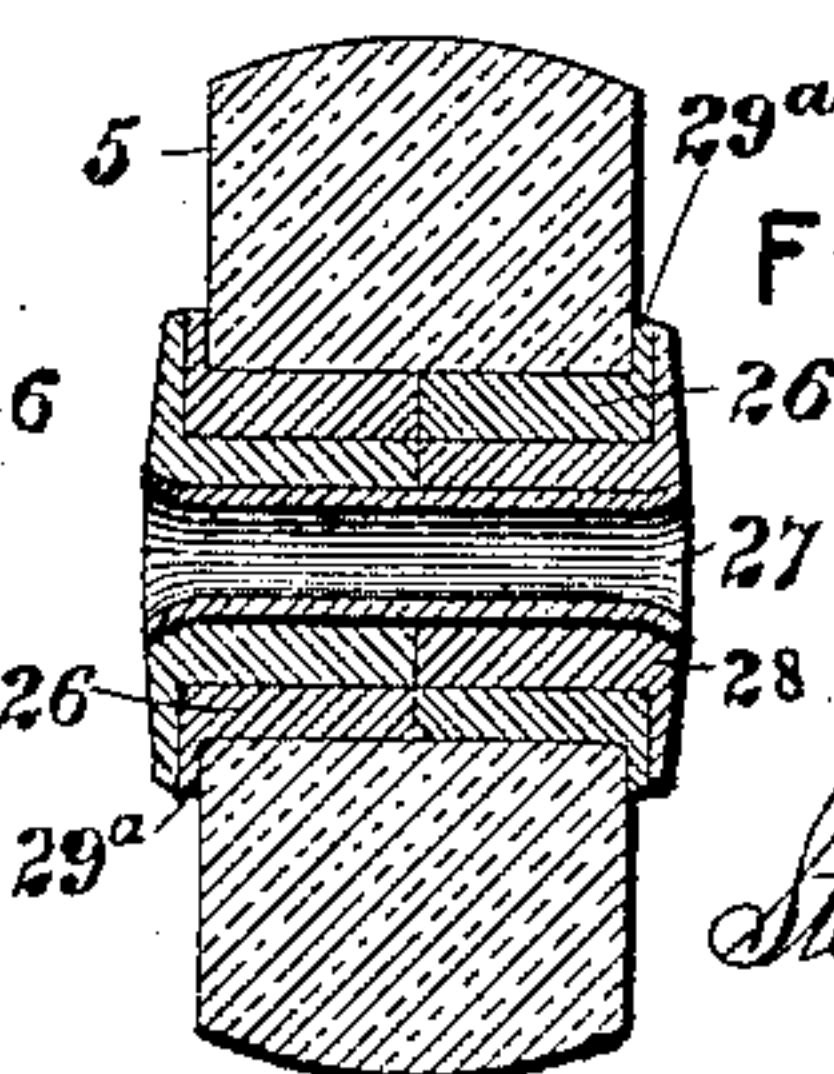


FIG. VII.



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UNITED STATES PATENT OFFICE.

STEPHEN C. MENDENHALL, OF RICHMOND, INDIANA.

CASTER.

SPECIFICATION forming part of Letters Patent No. 314,966, dated March 31, 1885.

Application filed February 11, 1885. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN C. MENDENHALL, a citizen of the United States, residing at Richmond, in the county of Wayne and State of Indiana, (present business address Cincinnati, Ohio,) have invented certain new and useful Improvements in Casters, of which the following is a specification.

The present improvements relate to modifications in the construction of casters, whereby the top or socket may be made more simply and cheaply, and a stronger stem or spindle be produced, having increased facility of swiveling movement in the socket or top. To these ends I preferably form the socket or top of the caster in two parts, having an enlargement at bottom for an annular series of anti-friction rollers and a horizontal flange extending beyond said enlargement, over which flange is turned or swaged a rim upon the cap-plate, as hereinafter described. The said anti-friction rollers are made with flat faces, for bearing upon the sides of the chamber in the top, and upon the spindle. Their sides, however, are preferably made curved, so as to bear at the extremities of their axes only upon the cap-plate, and thus lessen their friction while traveling around in the chamber in the top or socket. At its upper extremity the top or socket is provided with a hard-metal ball bearing upon the upper surface of a hard-steel pin passing entirely or partly through the spindle. Preferably, the spindle is provided with horizontal rollers at top, also, for lessening the lateral friction, the said steel pin forming the core of the spindle being made for this purpose to project sufficiently above the cast-iron portion of said spindle. The said lateral anti-friction rollers at top of the spindle are arranged in annular series within a box which is placed or forced into the top or socket in complete form.

In order that the invention may be better understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure I is a vertical section of the bottom of a piano-leg and of one of my improved casters applied thereto. Fig. II is an under side view of the top or socket with the cap-plate removed and the spindle in position therein in horizontal section. Fig. III is a horizontal section of the upper anti-friction bearing of

the spindle. Fig. IV is a vertical sectional view of the top of the socket, showing a modified form of bearing between said socket and the spindle. Fig. V is an axial section of the floor wheel or roller with the bushing placed therein, in readiness to be fixed together. Fig. VI is a similar view of the complete roller. Fig. VII is a similar view of a modified form thereof.

1 may represent a section of the bottom of a piano-leg, having cylindrical recess 2 for the metallic top or socket 3 of the caster, and hollowed out, as shown at 4, to allow freedom of swiveling to the floor-wheel 5. The socket 3 is made in two parts, the line of division being vertical, and the said two parts being fixed together by rivet 6 at top and by cap-plate 7 at bottom. The socket 3 is formed with annular enlargement or chamber 8, beyond which extends a circular flange, 9, over the inclined edge of which the rim or lip 10 of the cap-plate 7 is turned in fixing the parts of the socket together. When so fixed together, the socket is fastened to the furniture-leg by wood-screws 11, of any desired number, passing through the cap-plate and flange and into the body of the leg.

To make a spindle of great strength, and at the same time provide a hard smooth bearing at its upper end, I cast the main body 12 thereof around a central core or pin, 13, of hard steel, as shown in Figs. I and II, the pin 13 being first milled to hold it in position. Instead of passing entirely through the spindle, however, the said pin 13 may be made short, as shown in Fig. IV, and be forced into the spindle after the latter is cast. In either case the bearing of the socket upon the top of the pin is through the medium of a hard-metal ball, 14. I have shown two devices for maintaining the pin to vertical bearing on said ball. The preferred form is that shown in Fig. I, in which a number of anti-friction rollers surround the pin near its top and keep it in axial position. The form of this anti-friction bearing will be described hereinafter. Fig. IV represents a modification of this idea, in which the pin 13 is provided with a head, 15, resting down upon the top of the spindle, and having a concave bearing for the ball 14. It will be seen that with this arrangement very complete anti-friction movement is provided at the top of the socket,

and the spindle is maintained to its central position, for the reason that to depart from such a position would involve the lifting of the whole article of furniture above it, the tendency of the ball 14 being to settle into the lowermost position in the socket in the head of the pin. The head 15 of the pin 13 may be made to project slightly beyond the surface of the spindle, so as to be retained in place within the socket by means of stud or screw 15^a, driven into the side of the socket. Preferably, however, I combine with the vertical anti-friction devices means for preventing friction laterally upon both the top and the bottom of the spindle. At the bottom the spindle bears laterally against a series of loose rollers, 16, arranged in the chamber 8 in the bottom of the socket and resting upon the cap-plate 7. The bearing-faces of said rollers upon the spindle and the sides of the chamber are flat; but their sides are so curved as to limit the contact of the rollers and cap-plate to a single point—namely, the end of the axis of each roller. In casting a top in halves, as here shown, I form in the walls of chamber 8 a depression, 8^a, to facilitate in the drilling of a clean-cut path or way for the anti-friction rollers 16.

The lateral anti-friction movement at the top of the spindle consists of an annular series of flat rolls, 17, held in a box made of two cup-shaped pieces, 18 19, telescoped one into the other. Said cups may fit together loosely, or be forced one into the other with sufficient pressure to prevent them from falling apart. The outer cup, 19, is made with rib or circular lip 20, to occupy a corresponding groove in the sides of the socket for holding the anti-friction box within said socket. It will be seen that this method of application and retention of the anti-friction box to its proper position is principally adapted for a caster the top of which is formed in two parts, as here shown. If the top be cast solid, the anti-friction box will be forced up to its proper position with the necessary pressure, and the friction of its sides with the sides of the socket be depended upon for retaining it in its position. This anti friction box is shown and claimed in a copending application, No. 155,981, filed February 14, 1885, and is not herein claimed, except in so far as its form has been changed to adapt it to its novel position in a furniture-socket.

When intended for use as a non-separating caster, the spindle is provided near its base with a circular rib or collar, 21, situated immediately above the series of rollers 16, and of such dimensions that when the piece of furniture is raised and the spindle of the caster dropped it will be retained within the socket by resting said collar on said rollers.

A hole is necessarily left in the cap-plate for the insertion of the spindle when putting the caster together; and to prevent the accession of dust to the anti-friction movement by way of said hole a felt or similar washer, 22,

is provided, resting upon the saddle 23 and surrounding the spindle. The saddle 23 is provided with customary horns or ears, 24, supported by axle 25 upon the floor-roller 5. The said roller is made of glass, having an interior bushing consisting of a rubber cushion, 26, and metallic tube 27 of brass or other anti-friction metal. A metallic washer, 28, is provided at each side of the roller, countersunk to receive the said tube when turned over; and to prevent contact between said washers and the sides of the roller additional rubber washers, 29, are provided between the same, as shown. In Fig. V the bushing is shown assembled and ready to be fixed on by the turning over of the ends of the tube 27. In Fig. VI this operation has been performed; the roller has been completed and ready for placing in the caster. Fig. VII shows a modification of this construction in which the rubber cushion is made in two parts, each part having a flange, 29^a, serving the same purpose as the washers 29. In this construction, also, washers 28 are made with necks projecting into the roller under the cushion 26, to support the same from immediate contact with the tube 27.

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

1. In combination with a caster-top having enlargement or chamber at bottom and a horizontal flange projecting beyond said chamber, a cap-plate having upturned rim or lip adapted to be turned or swaged over the edge of said flange, substantially as set forth.

2. In combination with a caster socket or top, a hard metal ball in the top thereof, a spindle having a hard-steel pin on the top of which said ball is adapted to rest, and a horizontal anti-friction box for retaining said spindle to axial position, substantially as described.

3. In combination with a socket and spindle, two series of horizontal anti-friction rollers at the top and bottom of said spindle, respectively, and an anti-friction ball located at the top of said socket and resting upon the head of the spindle, for the purpose set forth.

4. In combination with a two-part socket having a groove near its top and a spindle adapted to rotate in said socket, an anti-friction box surrounding the upper end of said spindle and having outturned lip for occupying said groove, for the purpose set forth.

5. In combination with a socket and a spindle adapted to rotate therein, a series of loose horizontal anti friction rollers made with flat bearing-faces, upon which the spindle bears laterally, and which in their turn bear outwardly against the wall of the socket, said rollers having curved or conical sides to adapt them to touch at but a single point upon their supporting-plate.

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