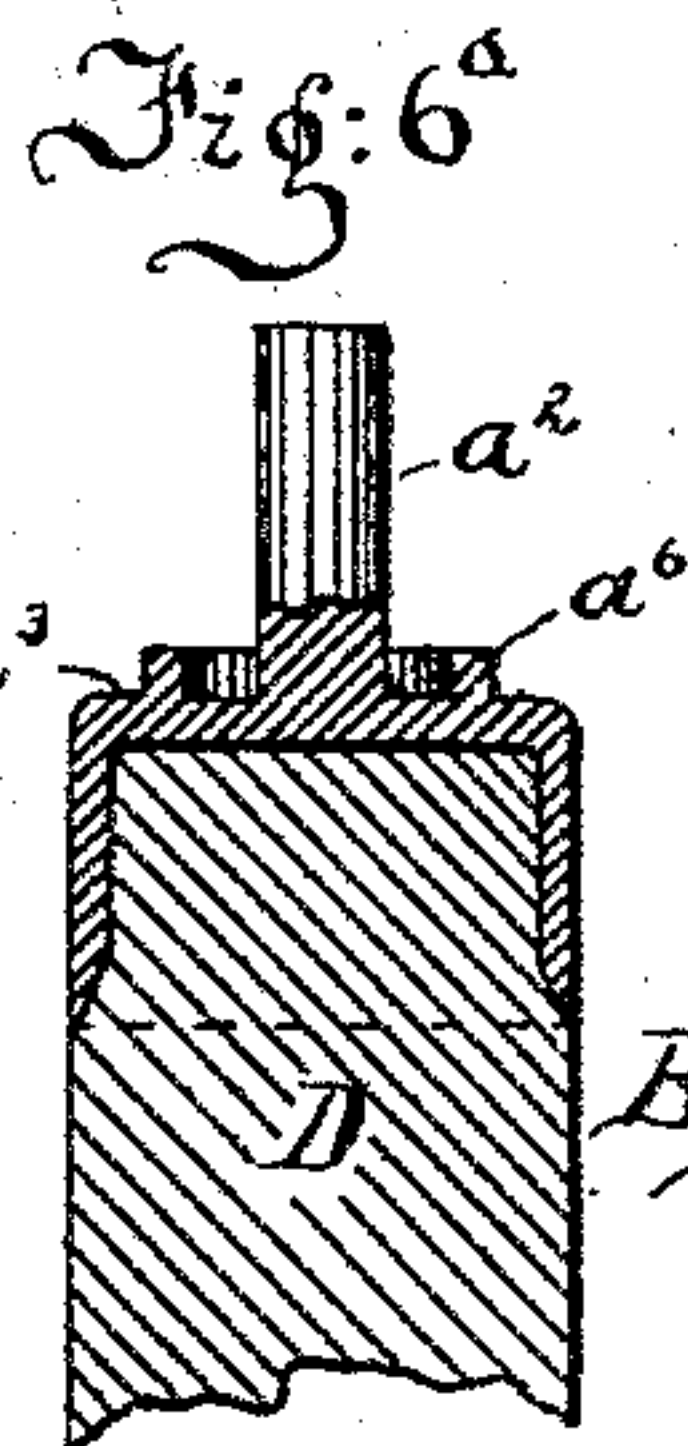
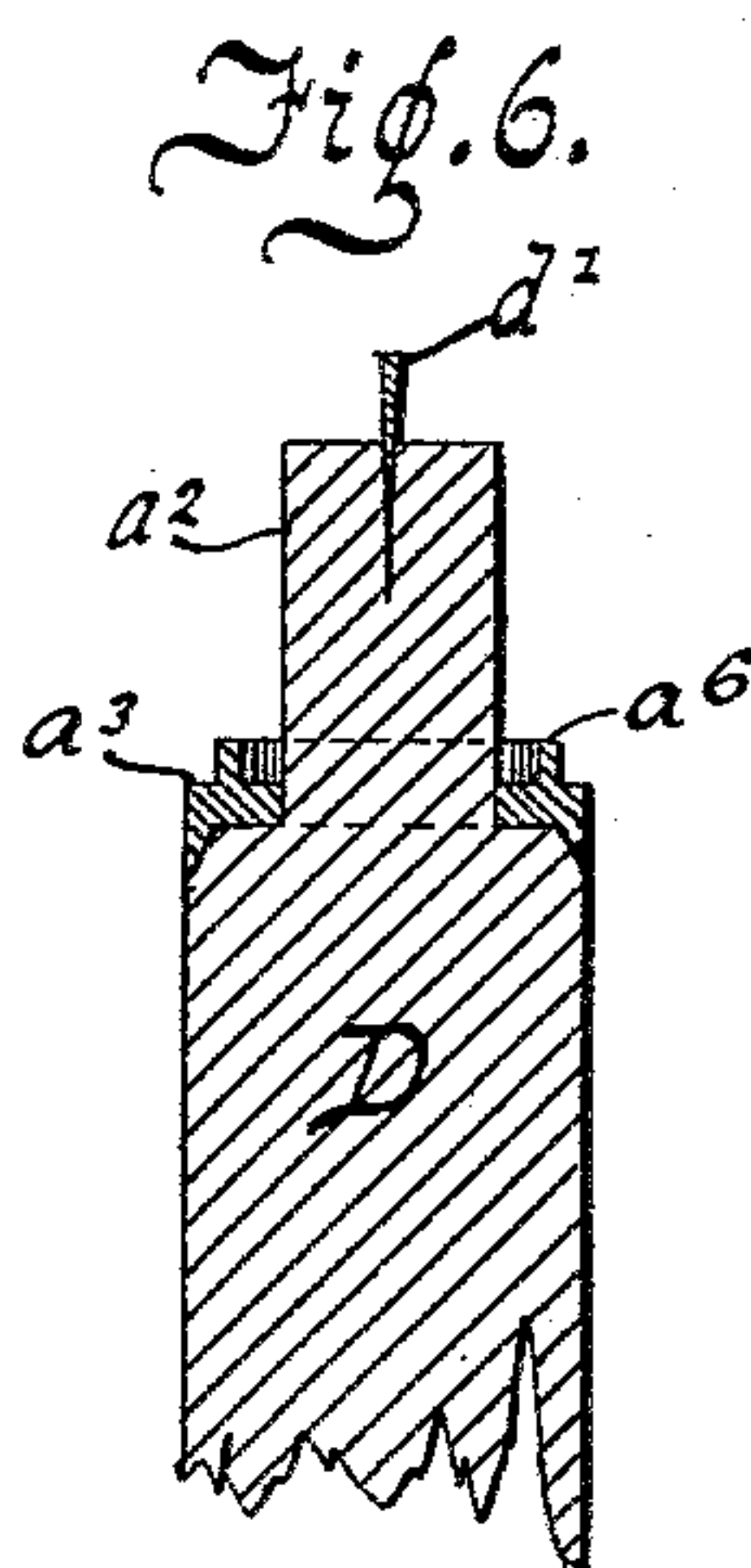
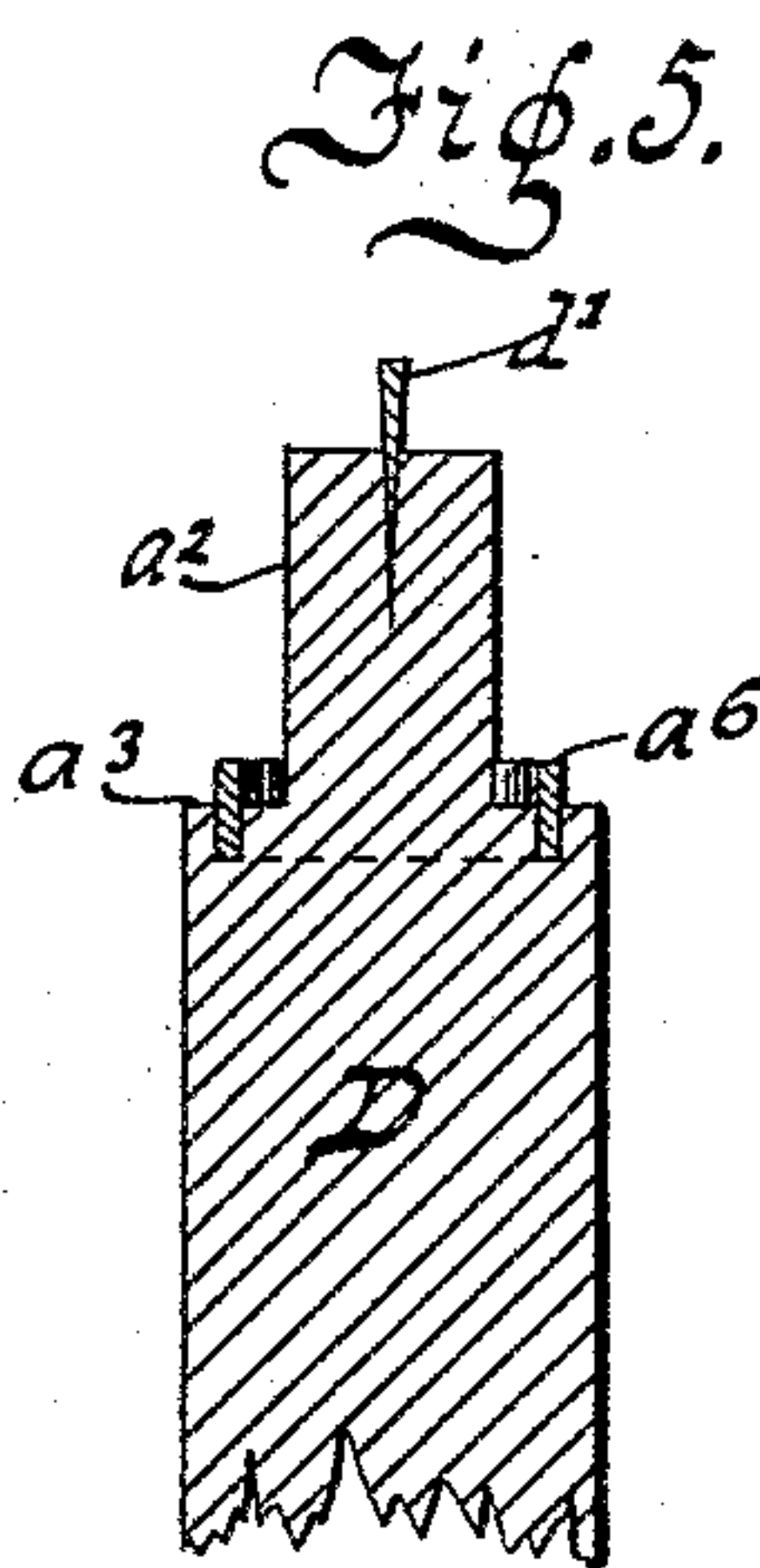
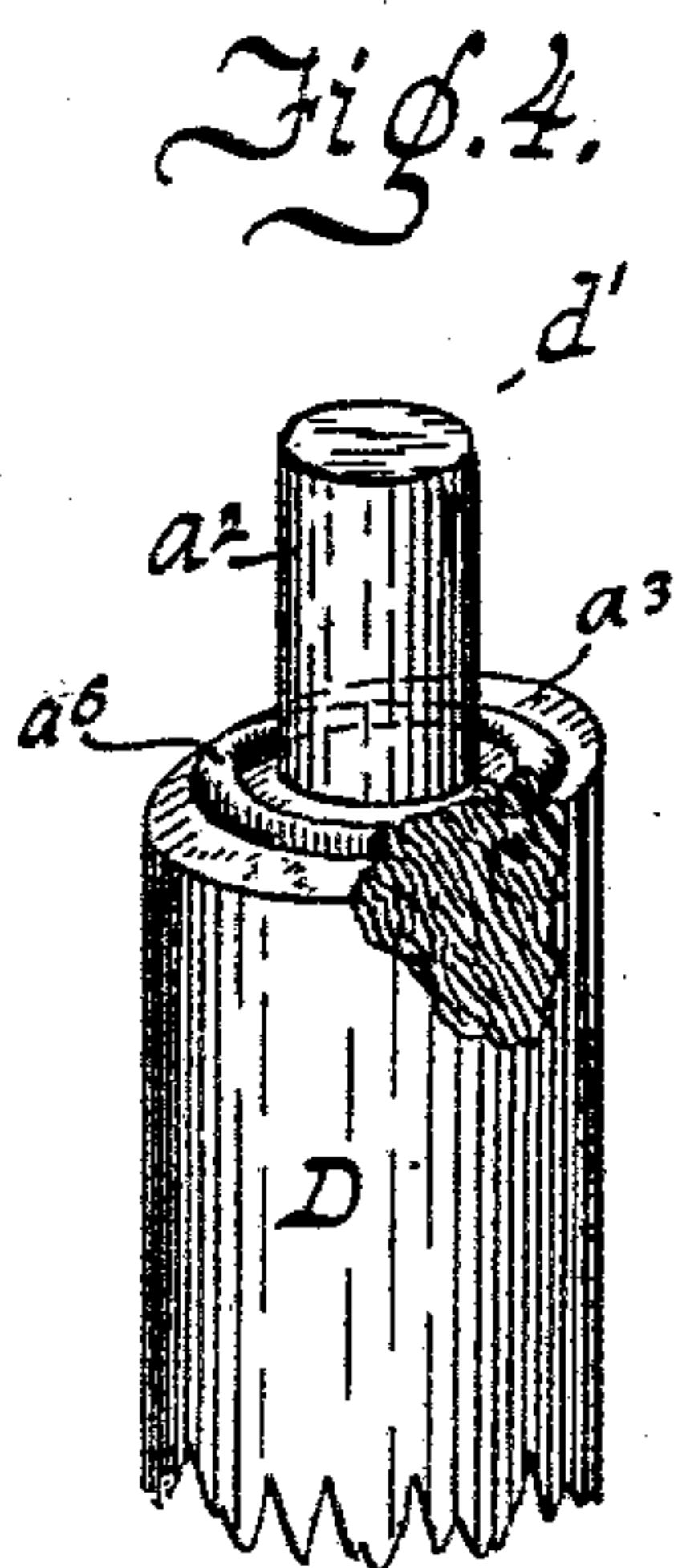
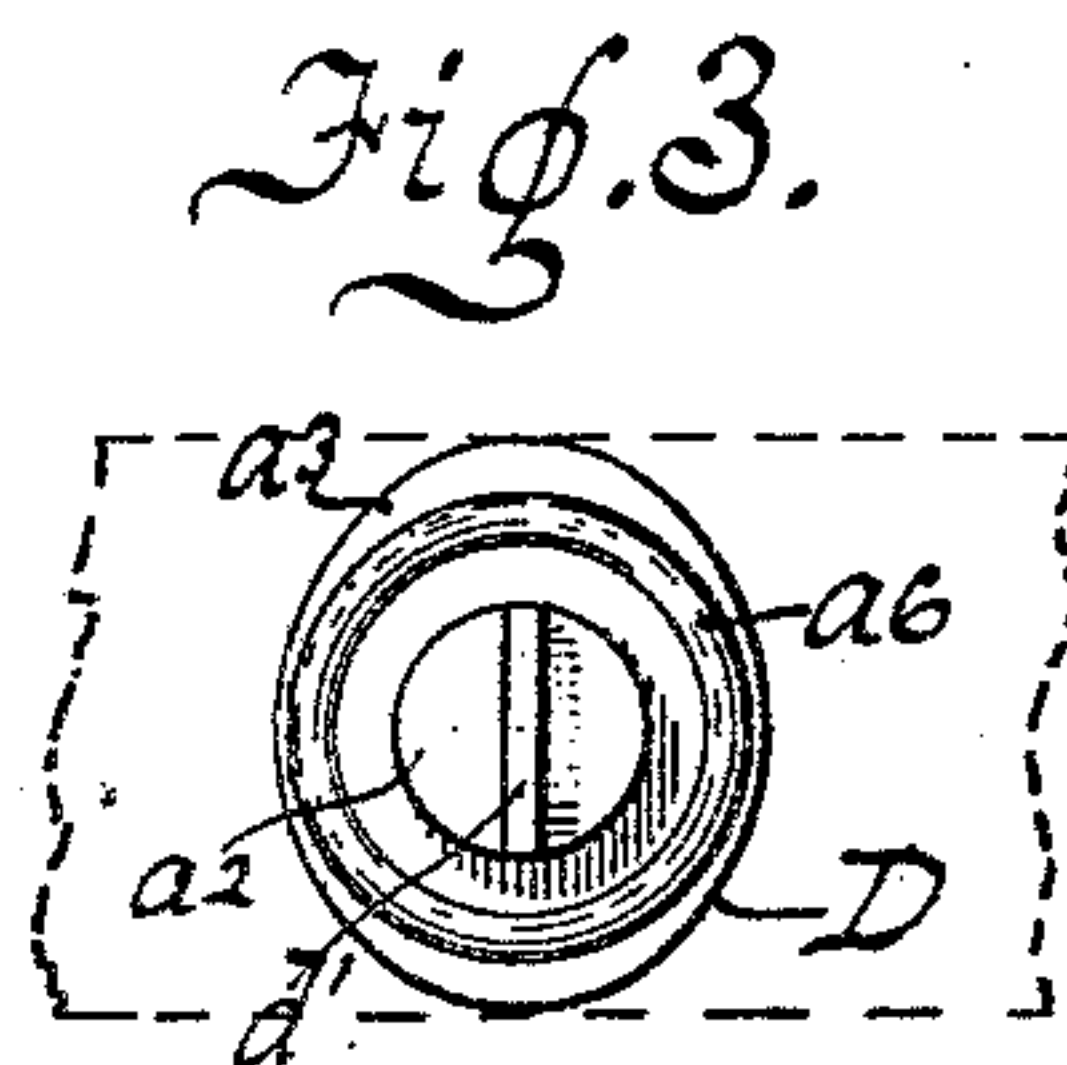
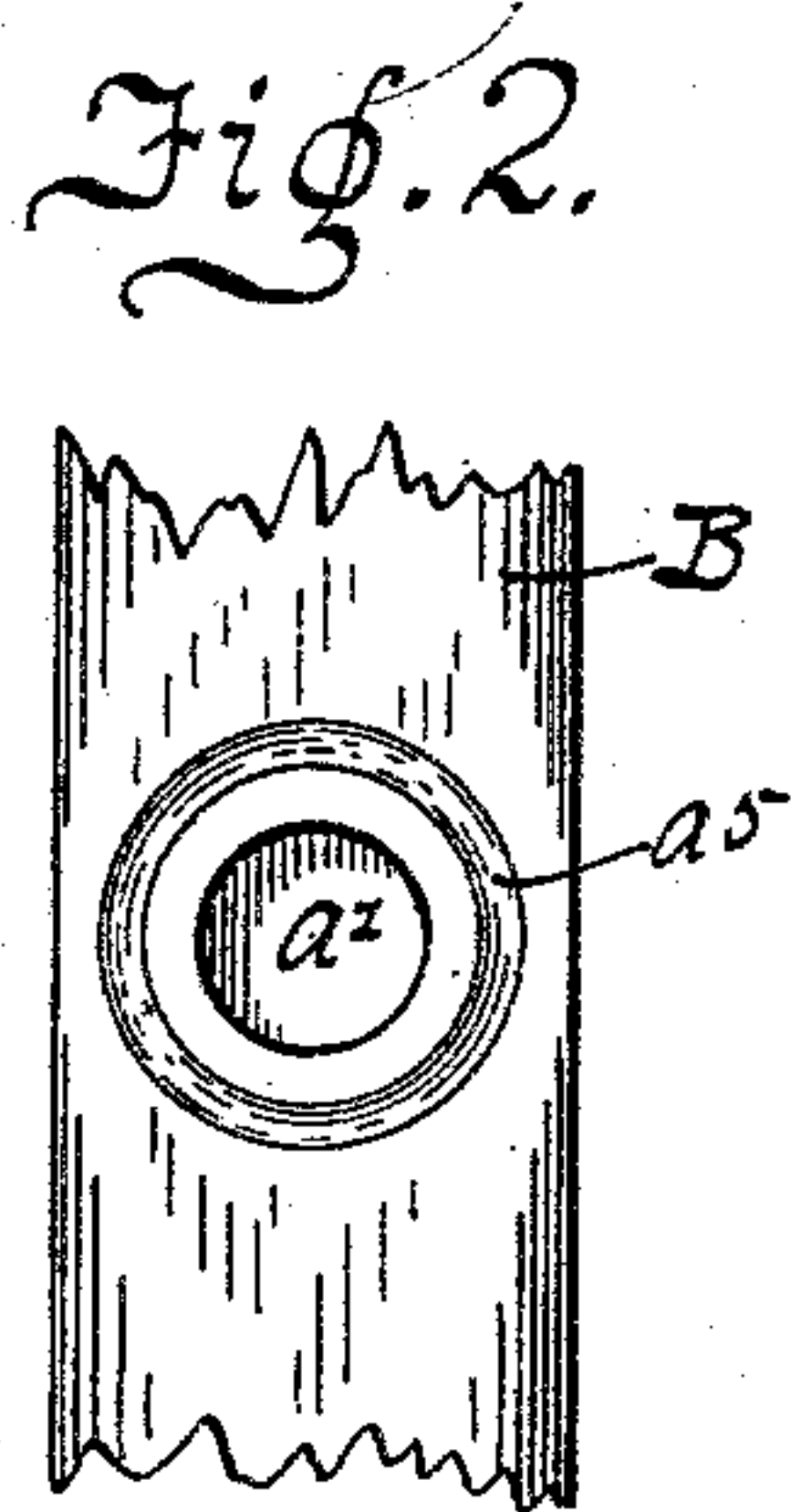
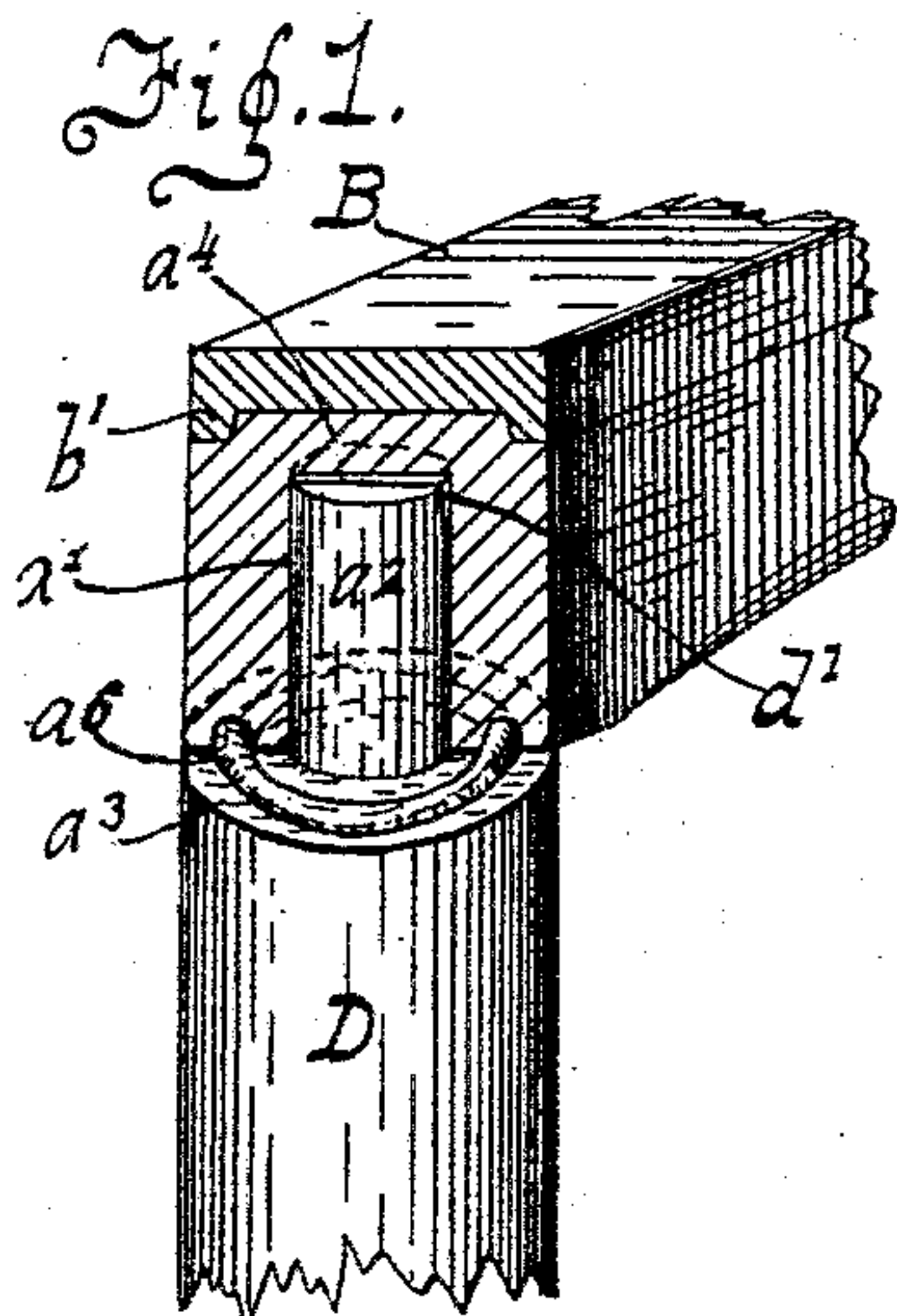


(No Model.)

M. B. MAHURIN.  
WHEEL.

No. 414,650.

Patented Nov. 5, 1889.



Witnesses.

N. E. Whitney.

Edward Meredith.

Inventor.

Melville B. Mahurin.

By Joseph A. Whitman.

Attorney.



# UNITED STATES PATENT OFFICE.

MELVILLE B. MAHURIN, OF INDIANAPOLIS, INDIANA.

## WHEEL.

SPECIFICATION forming part of Letters Patent No. 414,650, dated November 5, 1889.

Application filed February 4, 1889. Serial No. 298,619. (No model.)

*To all whom it may concern:*

Be it known that I, MELVILLE B. MAHURIN, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Wheels; 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.

My invention relates to improvements in vehicle-wheels.

The objects of the invention are as follows: first, to produce a wheel that will be cheap, simple, and durable; second, to produce a wheel the felly of which will not be liable to check or split from the strain exerted upon it by the bearing of the ends of the spokes, as in the ordinary method; third, to avoid, in the process of boring the holes in the felly for the tenons of the spokes, the great danger of injury to the felly resulting in checking by allowing the auger-bit to penetrate through the same, this being the cause of a very great loss to the wheel-maker.

With these objects in view my invention consists, primarily, in a wheel the felly of which has a series of spoke-holes bored therein from the inner side, and terminated at a point remote from the outer edge of said felly, to thereby leave a strengthening portion between the end of the spoke-hole and outer edge of the felly, in combination with a spoke having a tenon to fit said hole, substantially as and for the purpose herein described, and set forth in the claims.

It also consists in a wheel the felly or rim of which has a series of spoke-holes and a series of annular or other shaped grooves formed in its inner face around said spoke-holes, in combination with spokes having annular or other shaped projections or flanges to enter said grooves to prevent the felly spreading or splitting at the junction of the spokes, substantially as hereinafter described, and set forth in the claims.

It also consists in certain details of construction, and in the combination and arrangement of the several parts of the entire wheel, substantially as hereinafter described, and set forth in the claims.

Figure 1 represents in perspective a sectional detail of a portion of the wheel, showing the construction and arrangement of the spokes, felly, and tire; Fig. 2, an under side view of a portion of the felly; Fig. 3, an end view of the spoke; Fig. 4, a perspective detail of the spoke, partially in section; Fig. 5, a similar view of another form of spoke; and Figs. 6 and 6<sup>a</sup>, sectional details of a spoke, showing two different kinds of flanged plates secured thereto.

Referring to the drawings, A represents the felly, which will be constructed of any usual and suitable material and of ordinary pattern; B, the tire; C, the hub-block, and D the spokes that connect the hub and felly.

Formed in the inner face of the felly A, centrally with relation to its width, as clearly illustrated in Figs. 1 and 2, are a series of spoke-receiving holes or mortises  $a'$ , into which the upper spoke-tenons  $a^2$  on spokes D are driven, which spokes are shouldered at  $a^3$  in the usual manner. These spoke holes or mortises, as shown, preferably oval, (with the greatest diameter of the oval at right angles with the felly,) but not limited as to shape, do not extend entirely through the felly, as usual, but terminate at a point considerably remote from the outer periphery of said felly, thus leaving a bridge or strengthening strip  $a^4$  between said peripheral line of the felly and end of the spoke-hole. (See Fig. 1.) These holes or mortises are preferably formed with an auger not provided with the usual gimlet-point. The purpose is obvious.

The felly may be further improved and strengthened as follows: Formed in the inner face of the felly, around each spoke-hole  $a'$ , is a shallow groove  $a^5$ , preferably annular in form and concentric with the spoke-hole it surrounds, to receive a similarly-shaped flange  $a^6$  on the shouldered portion of the spoke D, which flange, when seated in the groove in the felly, (as it is when the tenon of the spoke is driven into its spoke-hole,) will strengthen the felly and prevent its checking or splitting at the junction of the spoke. The groove  $a^5$  and flange  $a^6$ , therefore, may be of any desired configuration. The flange  $a^6$  is preferably formed directly upon and apart with the spoke, as it can thus be formed without addi-



tional cost over the usual form of tenon, as shown in Figs. 1 and 4; or it may be formed of metal of any desired configuration and partially embedded in the end of the spoke, as shown in Fig. 5; or, if desired, the spokes may be provided with metal sockets or collars having flanges, or flanges and tenons, formed therein to enter the grooves in the felly, as shown in detail, Figs. 6 and 6<sup>a</sup>.

10 The felly, with my improvements as described above, may be supported with the ordinary flat tire secured with bolts in the usual manner; but I prefer the form as indicated at B, Fig. 1, having two inwardly-projecting  
15 continuous flanges  $b'$ —one at each side—to embrace the sides of the felly at its upper edge, said flanges holding the tire against lateral displacement, prevent the splitting of the felly, and obviate the necessity of using a  
20 great number of bolts to hold the tire in place, as heretofore, thereby weakening the felly. It is obvious that the tenon  $a^2$  is preferably of such length that the bearing of the rim on its end and shoulder  $a^3$  will be uniform.  
25 For the purpose of retaining the rim A in close contact with the shoulder of the spoke, which is ordinarily done by "wedging" the tenon, in order that a wheel may not be "rim-bound" after the tire is set, the spoke  
30 hole or mortise in the rim may be of oval shape, in combination with a round tenon, or the tenon may be oval, in combination with a round tenon spoke-hole; or the end of tenon may be fitted with a small wedge to be forced  
35 into the end of the tenon by coming in contact with the bottom of the tenon-hole, as clearly shown.

I do not limit the flange  $a^6$  and groove  $a^5$  to the form of spoke hole or mortise  $a'$ ; but said  
40 flange and groove may be used with great advantage in combination with the ordinary tenon and hole extending through the rim.

To increase the tightness of bearing of the tenon in its mortise and render that portion

of the spoke within the hub of relatively 45 greater strength than that extending beyond the latter, so that the wheel shall be capable of resisting greater lateral strain, I prepare the tenon ends of the spoke-blanks by compressing them on all sides before shaping 50 them to form tenons. The compression is preferably made greatest at the inner ends of the tenons and is gradually lessened outwardly, so as to relieve the fiber from pressure where the spokes leave the hub.

I claim—

1. In a wheel, a felly having grooves formed in its inner face around the spoke-holes, or partially around the spoke-holes, in combination with spokes having flanges formed upon 60 or secured to their ends to enter said grooves, substantially as shown and described.

2. In combination, the felly A, having grooves formed in its inner face around the spoke-holes, the wooden shouldered spokes D, 65 and the metallic plates secured to the ends of the spokes and having a portion embedded in the grooves around the spoke-holes, substantially as shown and described.

3. The felly A, having the spoke-holes  $a'$ , 70 terminating at a point remote from the periphery of the felly, and having annular or other shaped shallow grooves formed in the inner face around the spoke-holes, in combination with the shouldered spokes D, having 75 flanges turned or formed thereon to enter the grooves in the felly and secured to the felly in such manner that their shoulders abut closely against the inner face, and the ends of the tenon abut against end wall of the 80 spoke-hole of said felly, substantially in the manner shown, and for the purpose set forth.

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

MELVILLE B. MAHURIN.

Witnesses:

JOSEPH A. MINTURN,  
N. E. O. WHITNEY.