

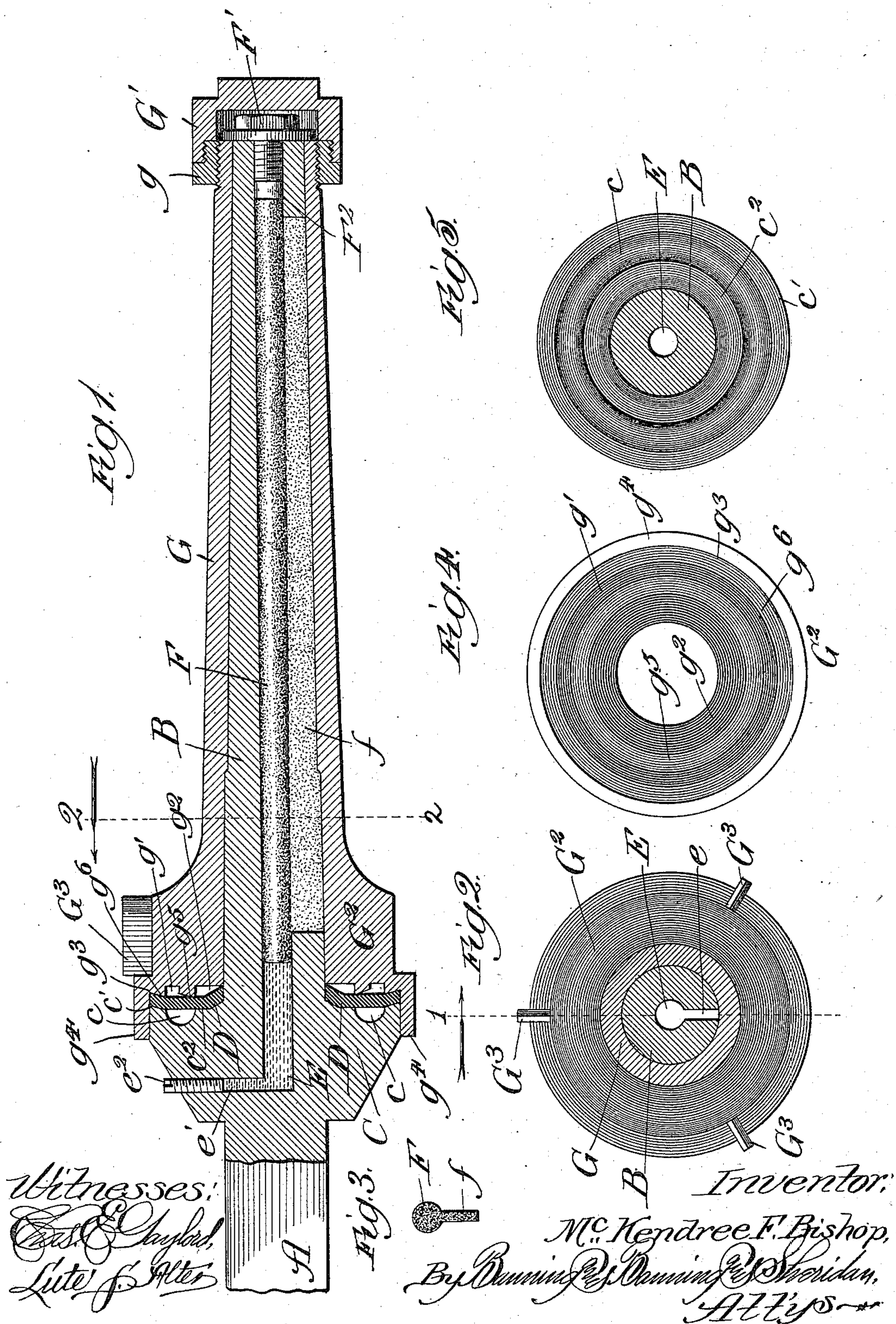
(No Model.)

2 Sheets—Sheet 1.

McK. F. BISHOP.
AXLE AND AXLE BOX.

No. 572,925.

Patented Dec. 8, 1896.



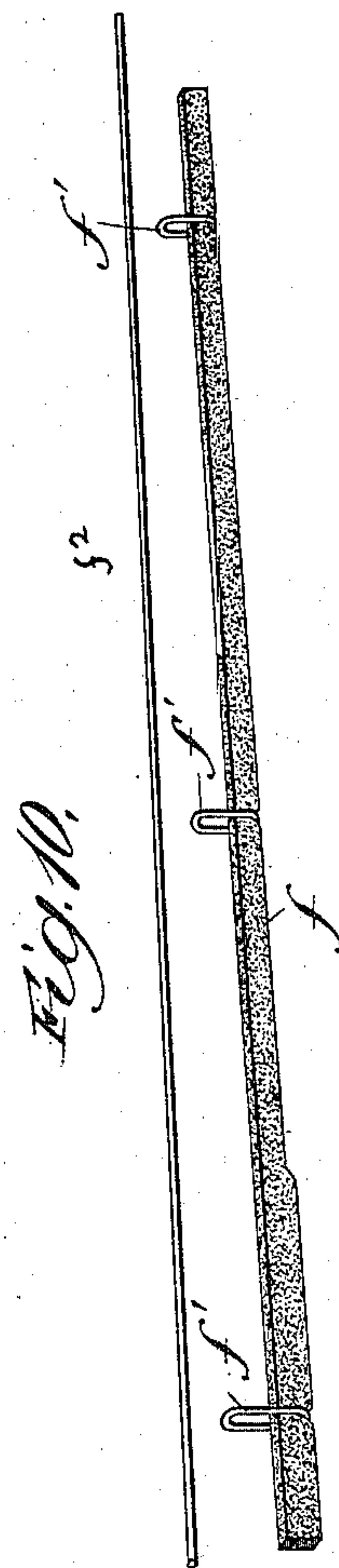
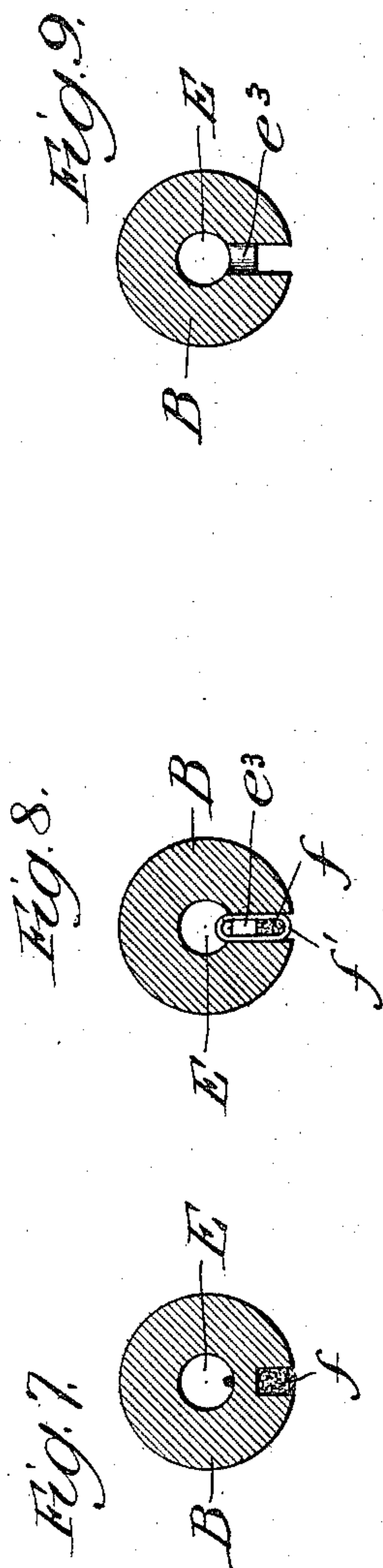
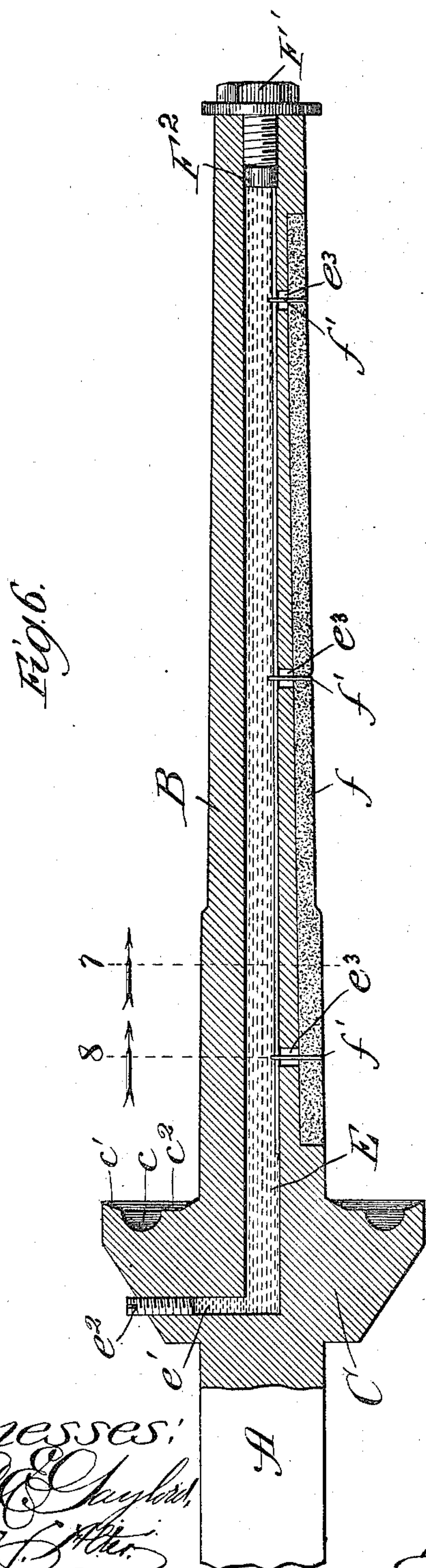
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2 Sheets—Sheet 2.

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Witnesses:
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UNITED STATES PATENT OFFICE.

MCKENDREE F. BISHOP, OF ALAMEDA, CALIFORNIA.

AXLE AND AXLE-BOX.

SPECIFICATION forming part of Letters Patent No. 572,925, dated December 8, 1896.

Application filed January 17, 1896. Serial No. 575,875. (No model.)

To all whom it may concern:

Be it known that I, MCKENDREE F. BISHOP, a citizen of the United States, residing at Alameda, Alameda county, California, have invented certain new and useful Improvements in Axles and Axle-Boxes, of which the following is a specification.

In the drawings, Figure 1 is a longitudinal section of my improved axle and axle-box, taken in line 1 of Fig. 2. Fig. 2 is a transverse section on line 2 2, Fig. 1. Fig. 3 is an end view of a lubricating-packing used in connection with my other improvements. Fig. 4 is an end view of the axle-box removed from the axle-spindle. Fig. 5 is an end view of a transverse section of the axle with the boxing removed. Fig. 6 is a longitudinal section of a modified form of axle. Fig. 7 is a transverse section taken in the line 7 of Fig. 6. Fig. 8 is a transverse section taken in the line 8 of Fig. 6. Fig. 9 is the same as Fig. 8 with the lubricating-packing and retaining-ring removed; and Fig. 10 is a perspective view of the lubricating-packing, retaining-rings, and holding-rod detached from the spindle.

In making my improved axle and axle box or bushing I make an axle A, provided with a spindle B at its respective ends. This axle may be made of steel or other suitable material. I make a shoulder C at the inner end of the spindle. This shoulder is provided on its outer face with a groove *c*, preferably annular in form, as shown in the drawings. By providing the outer face of the shoulder with this groove an outer and an inner seat *c'* and *c''* are formed on which a packing or other suitable material D may rest when the parts are assembled together for use. I provide the spindle of the axle with a longitudinal hole E, preferably extending through its length in the center of the spindle, although it need not be arranged in a central position. From this longitudinal hole E, I extend out to the edge of the spindle an opening or passage *e*, as shown in Fig. 1, or *e'*, as shown in Fig. 6. This opening or passage may be in the form of a longitudinal slot, as shown in Fig. 1, or in the form of holes, as shown in Fig. 6, terminating in a shallow longitudinal slot, as shown; but in either case the hole or passage,

whatever its form, extends from the longitudinal hole E to the edge of the spindle.

The object of the longitudinal hole and the lateral opening or openings is to permit an oil or lubricant to be introduced into the spindle to obviate friction between the spindle and the axle-box when the parts are assembled and in use. To permit or facilitate the introduction of this lubricant, I provide a lateral hole *e'*, which preferably extends in through the shoulder C, and which is covered, plugged, or stopped in any desired way. I have shown it stopped with a small bolt *e''*, which is screwed in from the outside, although other means may be employed for stopping the hole and preventing the escape of the oil or lubricant and the entry of dust or other foreign substances. If desired, the hole *e'* may be enlarged or hollowed out in the shoulder C, so as to form a chamber or reservoir adapted to contain a surplus quantity of lubricant.

In order to insure a conveyance of the lubricant from the longitudinal hole to the outer edge of the spindle in constant and proper quantities, I arrange a lubricating-packing F, (shown in Fig. 1,) made of felt or other suitable absorbent material, which is adapted to absorb or take up the lubricant and remain saturated with the same. This lubricating-packing may be provided with a lateral packing-strip *f*, as shown in Fig. 1, adapted in some cases to extend from the longitudinal hole out through the opening or openings to the outer edge of the spindle. I have shown it as formed integral with the main body F in Figs. 1 and 3, although it may be made as a separate piece, if desired, as shown in Figs. 6 and 10. When made as in Figs. 6 and 10, the groove or slot *e* does not extend clear into the longitudinal hole E, but communicates with it at intervals by openings *e''*. To hold the strip of lubricating-packing *f* in place, I employ a number of retaining-rings *f'*, which encircle the packing-strip and extend into the interior of the longitudinal hole, where they are caught and held by a holding-rod *f''*, as shown in Figs. 6 and 10. In this arrangement the lubricating-oil passes out from the longitudinal hole and saturates the packing-strip. This lubricat-

ing-packing may be dispensed with in whole or in part, particularly when certain kinds of lubricants are employed, and I do not mean, therefore, to limit myself to its use, except in those claims in which it is specifically mentioned as an element. In order to close the outer end of the spindle and to compress the lubricating-packing when used to a desired extent and retain it in its proper place and to hold the axle and box in an assembled position, I employ a nut or cap F' , which is adapted to be screwed into the outer end of the spindle as far as desired, as shown in Fig. 1, although other means may be used for the purpose, if preferred. To prevent the oil from flowing out when the nut or cap F' is removed, I insert a plug F^2 in advance of it, which remains in place and keeps the oil from escaping.

I make the axle box or bushing G with a longitudinal hole or bore of the proper size and shape to admit the axle-spindle. This box is preferably provided at its outer end with screw-threads to receive a collar or ring g , as shown in Fig. 1. This collar is also in turn preferably provided with screw-threads, so as to adapt it to receive a cap G' , which may be screwed on to cover the end of the spindle, as shown in Fig. 1, so as to exclude sand, dirt, or other foreign substances and to assist in retaining the parts in their proper assembled condition, while at the same time operating to prevent any oil from working out at the end of the spindle and coming in contact with the wood forming the hub of the wheel. These parts are therefore intended to be close fitting, and of course they may be assisted and reinforced by washers or other suitable means to insure the prevention of the escape of the oil, as above explained.

The inner end of the axle box or bushing is provided with a shoulder G^2 , having channels or grooves g' and g^2 and, when preferred, g^3 , preferably annular in form and with an external flange g^4 , intended to overlap the end of the shoulder C . By this construction seats g^5 and g^6 are formed, between which and the seats c' and c^2 the packing D is interposed and held in place when the parts are assembled together. The inner end of the axle-box is also preferably provided with outwardly-extending lugs G^3 to facilitate the engagement of the box with the wooden hub of the wheel in connection with which they are used. These lugs are preferably made wedge-shaped at their outer ends and are for convenience shown as arranged on the horizontal outer surface of the inner end of the axle-box, although they may be, if preferred, arranged on any desired portion of the box and may be made in any desired shape. After the axle-spindle and axle box or bushing are

assembled together they are held closely and tightly in the intended position by the cap F' . After the parts are assembled and the wooden hub of the wheel arranged on them the nut or collar g may be screwed in from time to time to compensate for any shrinkage that may take place in the wood of the hub, so that it can always be held in its normal condition of tightness in respect to the other parts.

Although I have described the various parts and their arrangement with considerable minuteness, I wish it understood that I do not intend to limit myself to details of construction further than as may be called for and specified in the claims, and as to such parts as are described as being "preferably" employed or which I have said may be dispensed with I desire it understood that I mean to limit myself to such parts only where they are specifically called for in the claims.

What I regard as new, and desire to secure by Letters Patent, is—

1. The combination of an axle-spindle provided with an inner shoulder having a channel or groove in its face, an axle-box provided with an inner shoulder having a channel or groove in its face and lugs on its outer surface, an interposed packing between the shoulder on the axle-spindle and the shoulder on the axle-box, and means for holding the axle-spindle and the axle-box in an assembled position, substantially as described.

2. The combination of an axle-spindle provided with an inner shoulder having a channel or groove in its face and provided with a longitudinal hole having a lateral opening or passage extending to the outer edge of the spindle, the longitudinal hole and lateral opening or passage being adapted to contain a lubricant, an axle-box provided with an inner shoulder having a channel or groove in its face, an interposed packing between the shoulder on the axle-spindle and the shoulder on the axle-box, and means for closing the outer end of the longitudinal hole in the axle-spindle and holding the spindle and box in a removable position, substantially as described.

3. The combination of an axle-spindle, an axle-box, means for holding the box in removable position upon the spindle, a longitudinally-adjustable nut, g , on the outer end of the axle-box, and an axle-cap, G' , screw-threaded on the box-nut, g , to inclose the outer end of the box and spindle, substantially as described.

MCKENDREE F. BISHOP.

Witnesses:

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