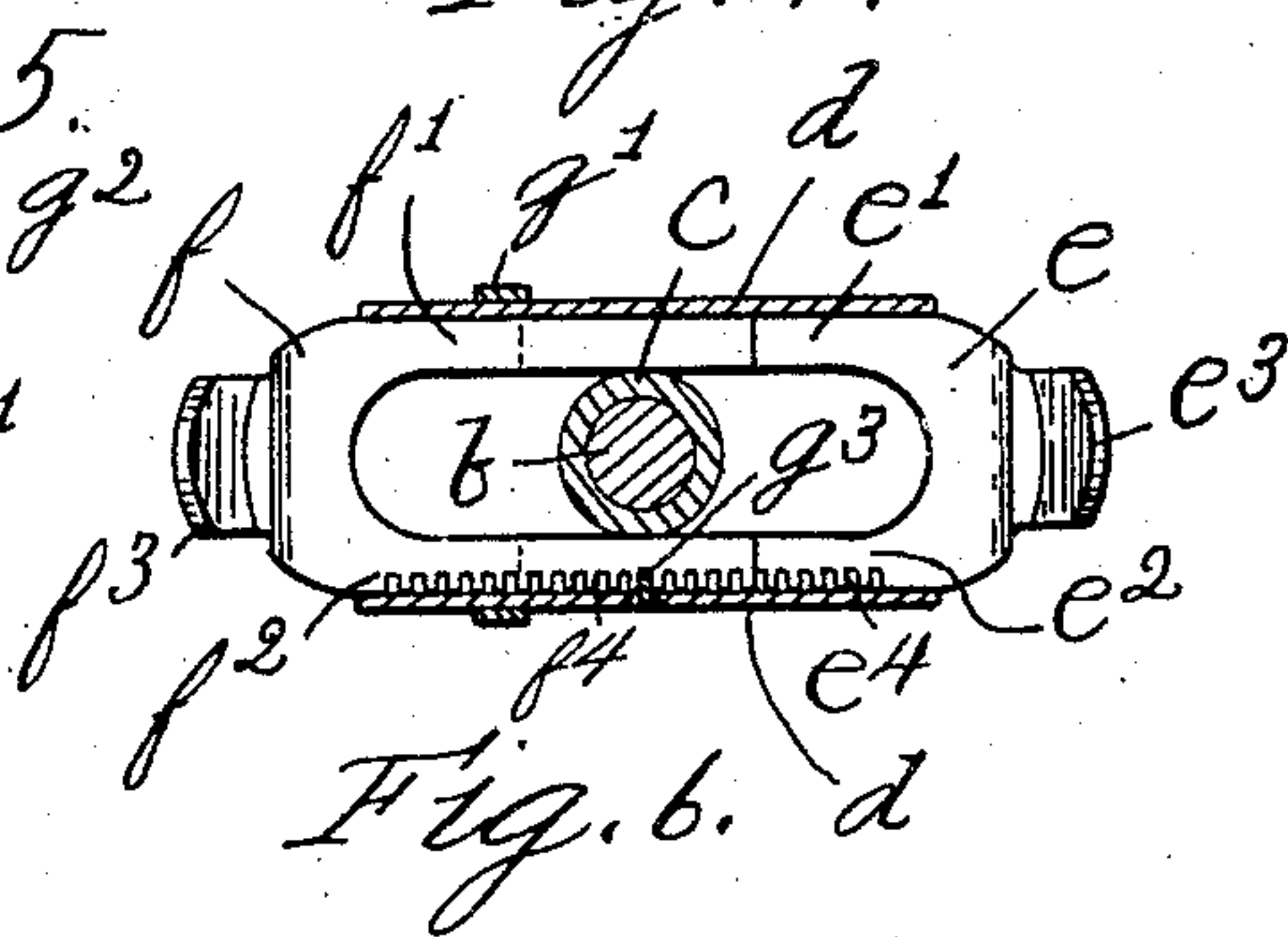
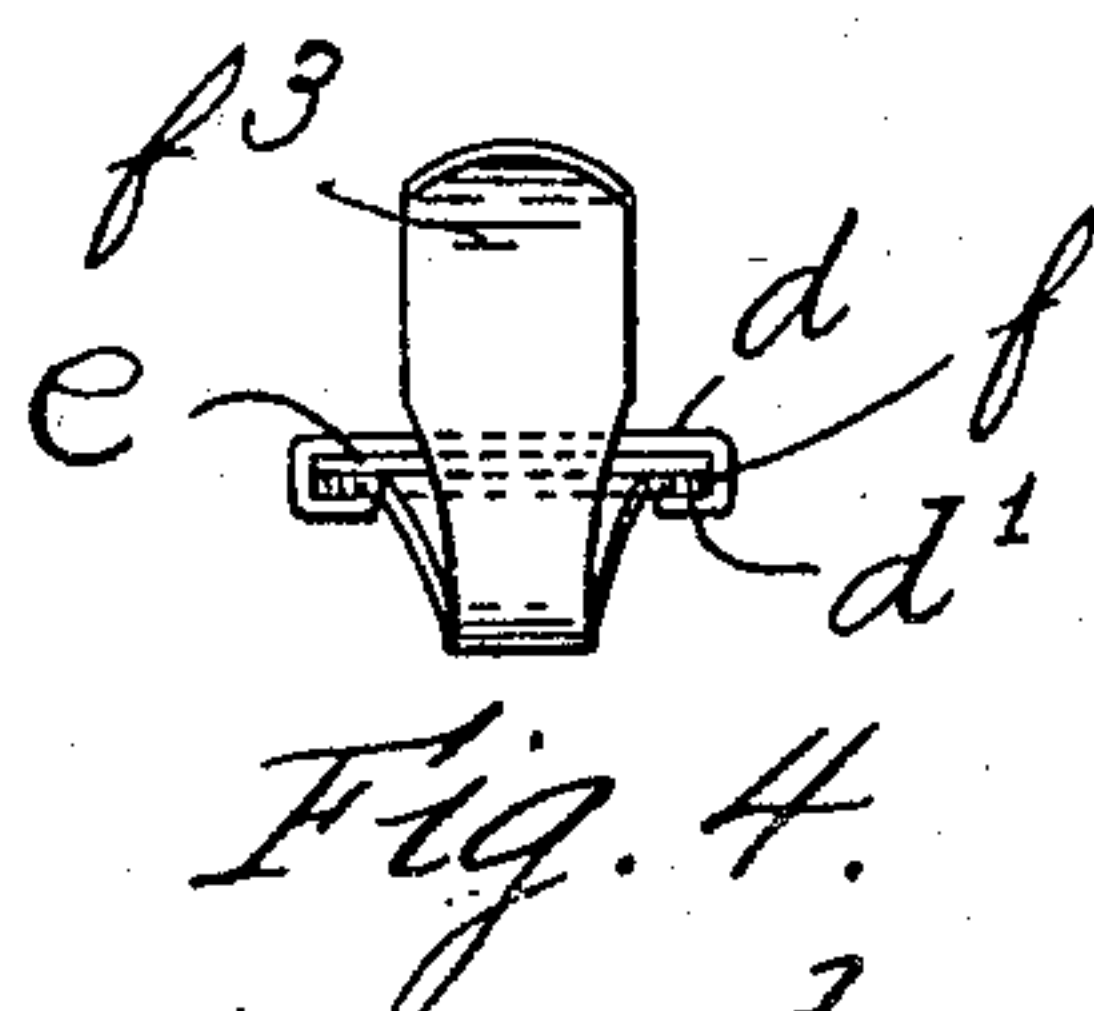
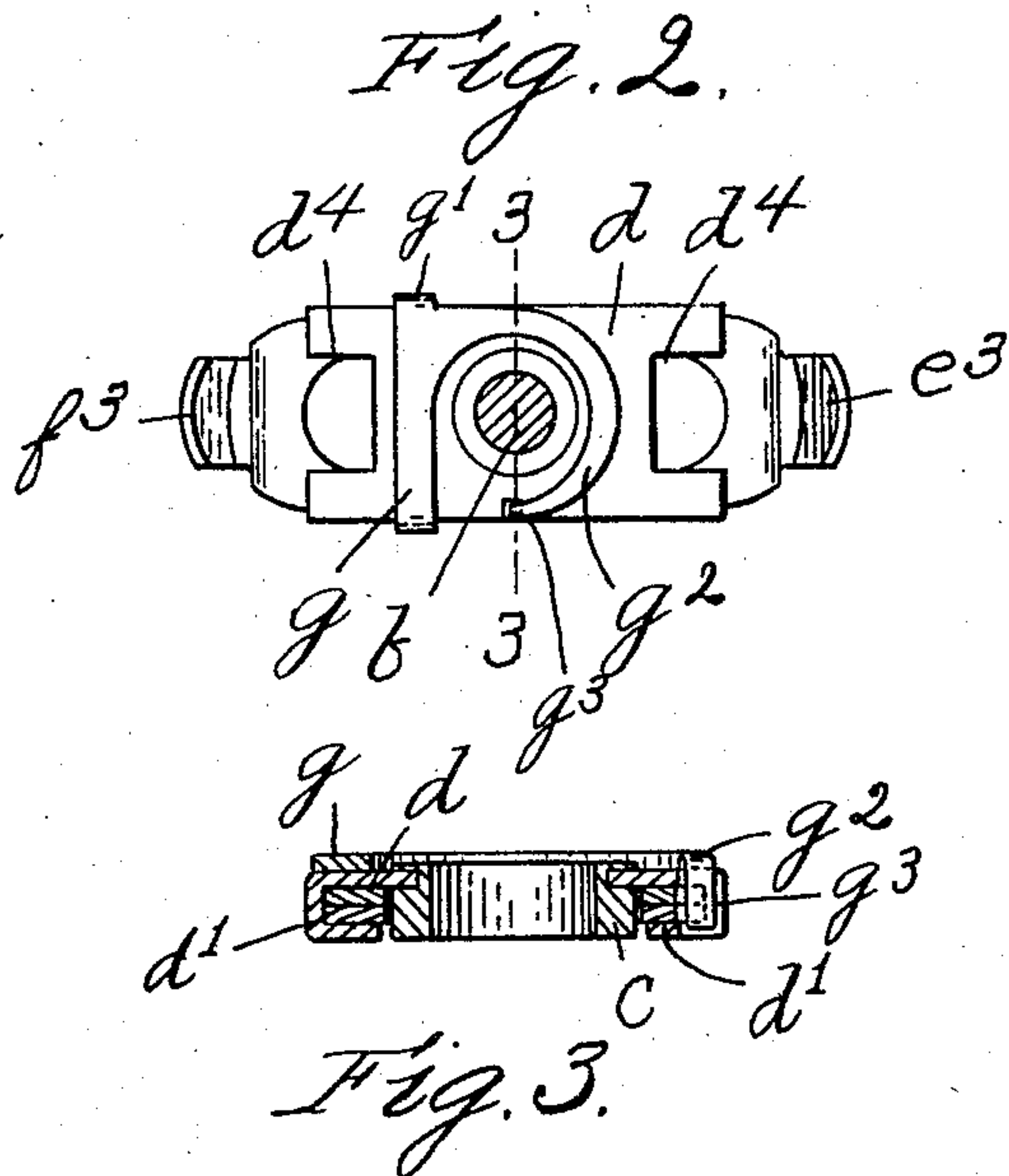
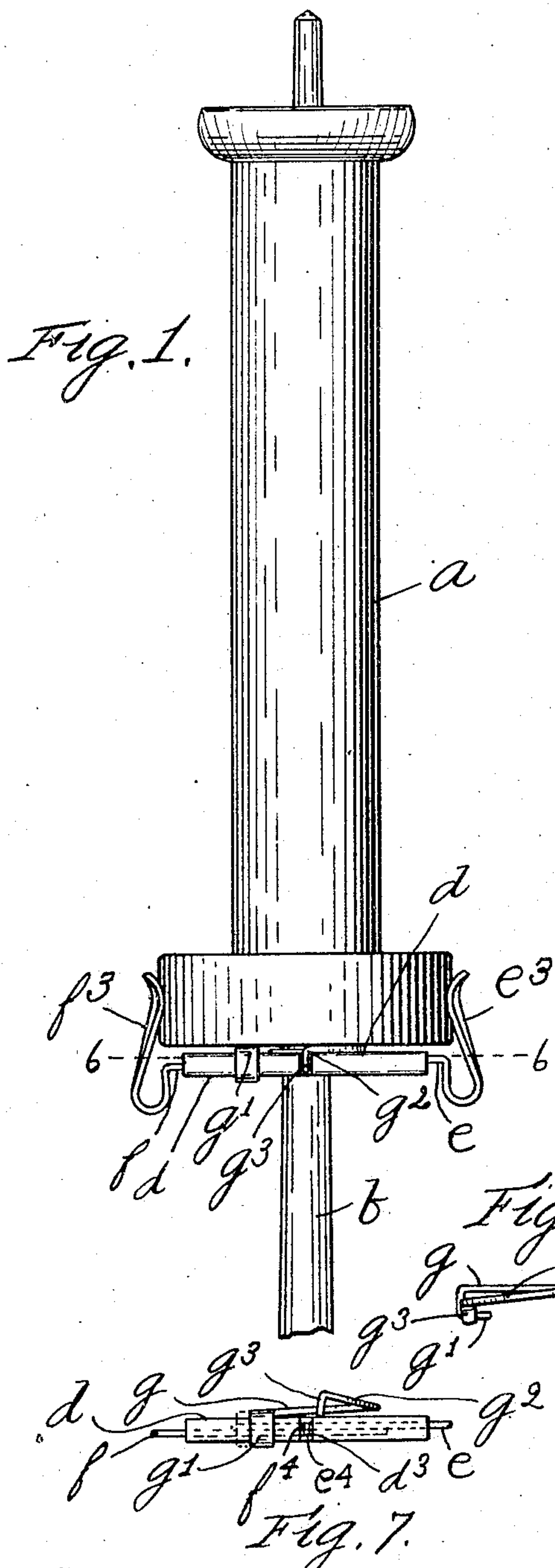


F. W. SAWORSKI.
SPINDLE AND BOBBIN CONNECTION.

APPLICATION FILED SEPT. 1, 1904.



Witnesses:
H. B. Davis.
Maud M. Piper

Inventor:
Fred W. Saworski
By Royest Hamman
Atty's

UNITED STATES PATENT OFFICE.

FREDERICK W. SAWORSKI, OF WALPOLE, MASSACHUSETTS.

SPINDLE AND BOBBIN CONNECTOR.

SPECIFICATION forming part of Letters Patent No. 788,282, dated April 25, 1905.

Application filed September 1, 1904. Serial No. 222,942.

To all whom it may concern:

Be it known that I, FREDERICK W. SAWORSKI, of Walpole, county of Norfolk, State of Massachusetts, have invented an Improvement in Spindle and Bobbin Connectors, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

10 This invention relates to that class of spindle and bobbin connectors which are mounted on the spindle and engage the exterior of the bobbin-heads and hold the bobbin from rotation and vertical movement on the spindle.

15 So far as I am aware the spindle and bobbin connectors now in general use must be made with special reference to the diameter of the head of the particular bobbins in connection with which they are to be used and in general are capable of no wider range of adjustment than is sufficient to compensate for the slight variations between bobbins of the same general size and is permitted by the resilience of the bobbin-retaining springs, 25 which must hold the bobbins firmly and yet permit the ready application thereof to or their removal from the spindle. The result is that the ordinary spindle and bobbin connectors must be made in various different sizes, 30 thereby making the difficulty and cost of manufacture thereof greater than if one size only were made and compelling textile manufacturers to change these connectors whenever they make a change in the size of their 35 bobbins. In practice, moreover, outside connectors are not ordinarily used for warp-thread bobbins and spools which have heads of large diameter, for the reason that they are too expensive.

40 The object of my invention is to provide a form of spindle and bobbin connector which may be conveniently adjusted, so that its bobbin-engaging fingers may engage the head of a bobbin of large diameter or one of relatively small diameter with practically the same tension and to thereby avoid the necessity of manufacturing more than one size of connector for all sizes of bobbins and which shall be simple in form and inexpensive to 50 manufacture. I accomplish this object by

means shown in the accompanying drawings, in which—

Figure 1 illustrates in side elevation a bobbin and spindle connector made according to my invention. Fig. 2 is a plan view of the connector. Fig. 3 is a section on the line 3 3 of Fig. 2. Fig. 4 is an end view of the connector. Fig. 5 is a detail view of the locking device. Fig. 6 is a plan view on the line 6 6 of Fig. 1. Fig. 7 is a partial side elevation 60 showing the parts in the unlocked position.

In Fig. 1 I illustrate a bobbin *a*, of a character commonly employed for warp-thread, mounted upon a spindle *b*. A supporting-ring *c*, similar to those used ordinarily in this connection, is fitted and tightly held upon the spindle *b*. The main support or body *d* of the connector is of rectangular form and is centrally secured to the upper end of the ring *c* by any convenient means. Said body is 70 preferably of stiff sheet metal, and the longitudinal edge portions thereof are bent downwardly and inwardly to provide longitudinal open-ended grooves *d'* at each edge and in the under side thereof. A pair of spring-fingers *e*³ and *f*³ are formed integral with shanks *e*² and *f*², respectively, said shanks extending at right angles to said fingers and being bifurcated from their ends to points adjacent the base of their respective fingers, thereby providing 80 parallel arms *e'*² and *f'*², which are adapted to pass at opposite sides of the ring *c* and to lie one over the other within the grooves *d'*, the width of said shanks being such that they fit and slide easily in said grooves. The arms *e'*² and *f'*², which overlap at one side of the spindle, are each provided with a regular series of recesses or notches *e'*⁴ and *f'*⁴, the notches of one series being arranged to register with those of the other series. A locking-clip *g*, of 90 sheet metal, is mounted upon the upper side of the body *d* and is held thereon by downwardly and inwardly extending fingers *g'*, which permit said clip to slide longitudinally thereof. A spring-arm *g*² is formed integral with the clip *g*, said arm being circular in form and arranged to encircle the ring *c*, as shown in Fig. 2, and to provide a seat for the end of the bobbin when it is in place on the spindle. An aperture or notch *d*³ is cut 100

into the bottom of the groove d' , in which the notched arms $e^2 f^2$ are located, and the end portion of the spring g^2 is bent downwardly to provide a locking-tongue g^3 , which
 5 is adapted to enter said notch d^3 and also to enter one of the notches f^4 and e^4 .

To adjust the finger $e^3 f^3$ for a particular bobbin, a gage having a central aperture and a diameter slightly less than that of the head
 10 of the bobbin is placed upon the spindle, and the spring-arm g^2 is raised, withdrawing the tongue g^3 from the notch d^3 , the clip g preferably being moved a short distance upon the body d , so that the end of the tongue g^3 may
 15 rest upon the upper side thereof, as shown in Fig. 7. The shanks $e f$ are then free to move in the groove d' in either direction, so that the spring-fingers $e^3 f^3$ are pressed together until each bears upon the gage. The locking
 20 device g is then moved so that the tongue g^3 again passes into the notch d^3 , and as one of the notches $e^4 f^4$ of each arm $e^2 f^2$ will be in register or nearly in register with said notch d^3 said tongue will pass therein and lock the
 25 spring-fingers in their adjusted position. As the bobbin is forced down upon the spindle its head will engage the outwardly-turned upper ends of the spring-fingers $e^3 f^3$ and press them apart sufficiently to permit the
 30 base of the bobbin to bear against the clip g , in which position the fingers will engage the head of the bobbin with just sufficient force to prevent movement of the bobbin with relation to the spindle, yet permitting the ready
 35 removal thereof or replacement thereon. The end portions of the body d are provided with notches d^4 of slightly greater width than said fingers, so that the latter may be adjusted from a position in which said fingers bear
 40 against the bottom of said notches d^4 in close proximity to the spindle, and in which position a bobbin of the smallest size may be securely held, to a position in which the notches $e^4 f^4$ at the extreme ends of arms $e^2 f^2$ will be
 45 engaged by tongue g^3 , in which position a spool or bobbin of the largest size may be securely held.

By this means I provide a form of connector which is adapted to all sizes of bobbins and
 50 which may be adjusted so that its spring-fingers will engage bobbins of all sizes with the same tension or force. Further, as I am enabled to make one size of holder for all sizes of bobbins I am enabled to lessen the cost of
 55 manufacture to a material extent over those forms of connectors which must be made in different sizes to correspond with the particular bobbins in connection with which they are to be used.

60 In case one of the spring-fingers breaks, a new one may be readily supplied without removing the body d from the spindle. All the parts may be made with dies from sheet metal and may be readily assembled, so that the cost
 65 of manufacture is small.

While various other forms of locking means for the fingers might be employed for my purpose which would be effective, yet the form shown is particularly desirable, for the reason that it is practically impossible for the tongue
 70 g^3 to escape from said notches, particularly as the spring g^2 is held down by the bobbin when on the spindle.

Although I have illustrated the most desirable form of my invention of which I am aware,
 75 yet various changes or modifications thereof may be made without departing from the spirit and scope of my invention.

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

1. A bobbin and spindle connector comprising a pair of spring-fingers connected to said spindle and adjustable with relation thereto,
 85 and means for locking said fingers in the various positions to which they may be adjusted, substantially as described.

2. A bobbin and spindle connector comprising a support connected to said spindle, having guide-grooves therein, a pair of spring-
 90 fingers mounted in said grooves and slidable radially therein, and means for locking said fingers at various positions in said grooves, substantially as described.

3. A bobbin and spindle connector comprising a support connected to said spindle and having parallel, horizontally-extending guide-
 95 grooves therein equidistant from and at opposite sides of the spindle, a pair of oppositely-disposed spring-fingers slidably mounted in
 100 said grooves and means for locking said fingers at different positions therein, substantially as described.

4. A bobbin and spindle connector comprising a support connected to said spindle, a pair
 105 of oppositely-disposed spring-fingers having bifurcated shanks extending at opposite sides of said spindle and slidably mounted in said support, and means for locking said shanks to
 110 said support, substantially as described.

5. A bobbin and spindle connector comprising a pair of spring-fingers connected to said spindle and adjustable with relation thereto,
 115 and means for simultaneously locking said fingers in the various positions to which they may be adjusted, substantially as described.

6. A bobbin and spindle connector comprising a support connected to said spindle and having guide-grooves therein, a pair of oppositely-disposed spring-fingers having bifur-
 120 cated shanks extending at opposite sides of said spindle and slidably mounted, one above the other in said grooves, and a spring-actuated clip for simultaneously engaging said
 125 shanks at different points to lock said fingers to said support, substantially as described.

7. A bobbin and spindle connector comprising a support connected to said spindle and having guide-grooves therein, a pair of oppositely-disposed spring-fingers having bifur-
 130

cated shanks extending at opposite sides of said spindle and slidably mounted, one above the other in said grooves, the overlapping portions of said shanks each having a series of recesses therein, and a spring-actuated locking-clip arranged to engage each shank in one of the recesses thereof simultaneously, substantially as described.

8. A bobbin and spindle connector comprising a support connected to said spindle and having guide-grooves therein, a pair of oppositely-disposed spring-fingers having bifurcated shanks extending at opposite sides of said spindle and slidably mounted, one above the other in said grooves, the overlapping portions of said shanks each having a series of recesses therein, and said support having an aperture leading to the recesses of said shanks, a spring-clip mounted on said support and having a locking-tongue adapted to enter said aperture and to engage each shank in one of the recesses thereof simultaneously, substantially as described.

9. A bobbin and spindle connector comprising a support connected to said spindle and having guide-grooves therein, a pair of oppositely-disposed spring-fingers having bifurcated shanks extending at opposite sides of said spindle and slidably mounted, one above the other, in said grooves, the overlapping portions of said shanks each having a series of recesses therein, and said support having an aperture leading to the recesses of said shanks, a spring-clip slidably mounted on said support and having a locking-tongue adapted to enter said aperture and to engage each shank in one of the recesses thereof simultaneously, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FREDERICK W. SAWORSKI.

Witnesses:

LOUIS H. HARRIMAN,
H. B. DAVIS.