

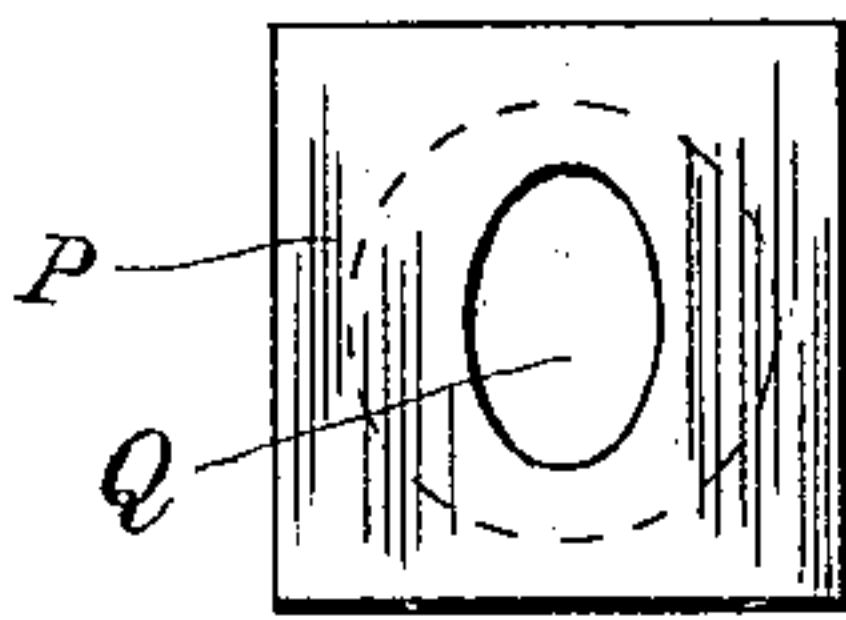
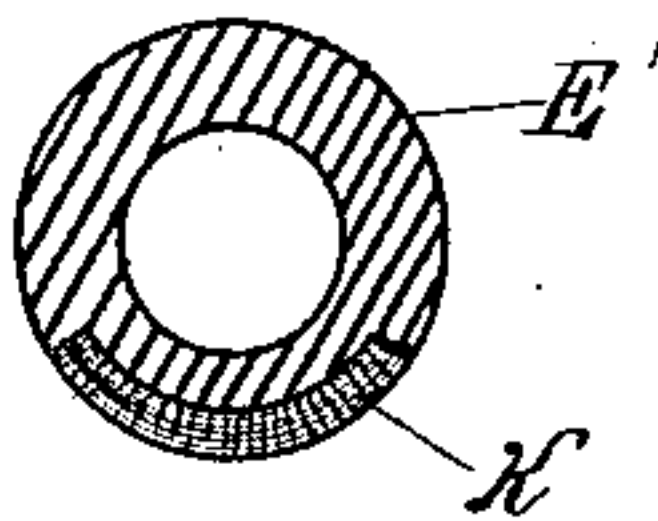
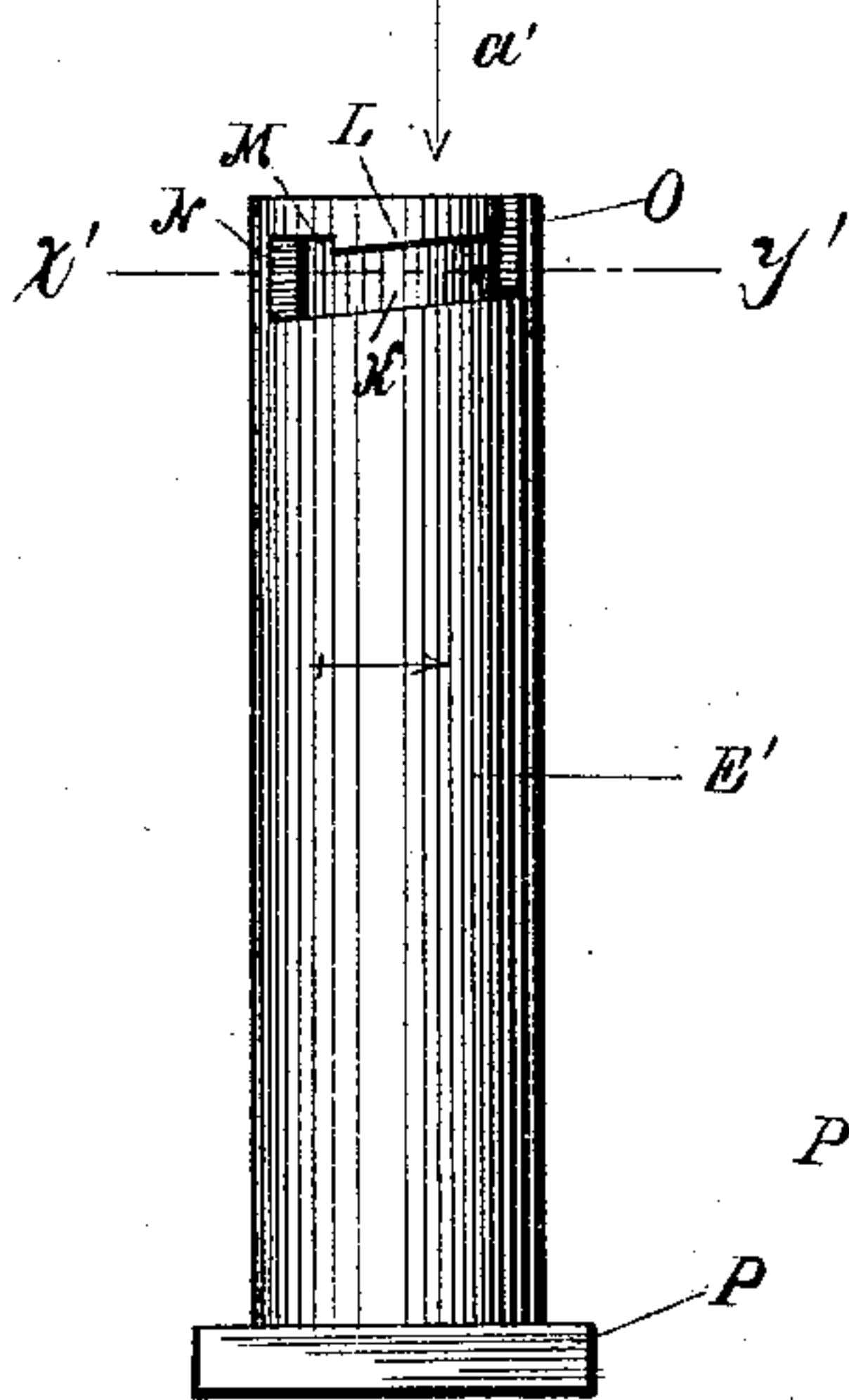
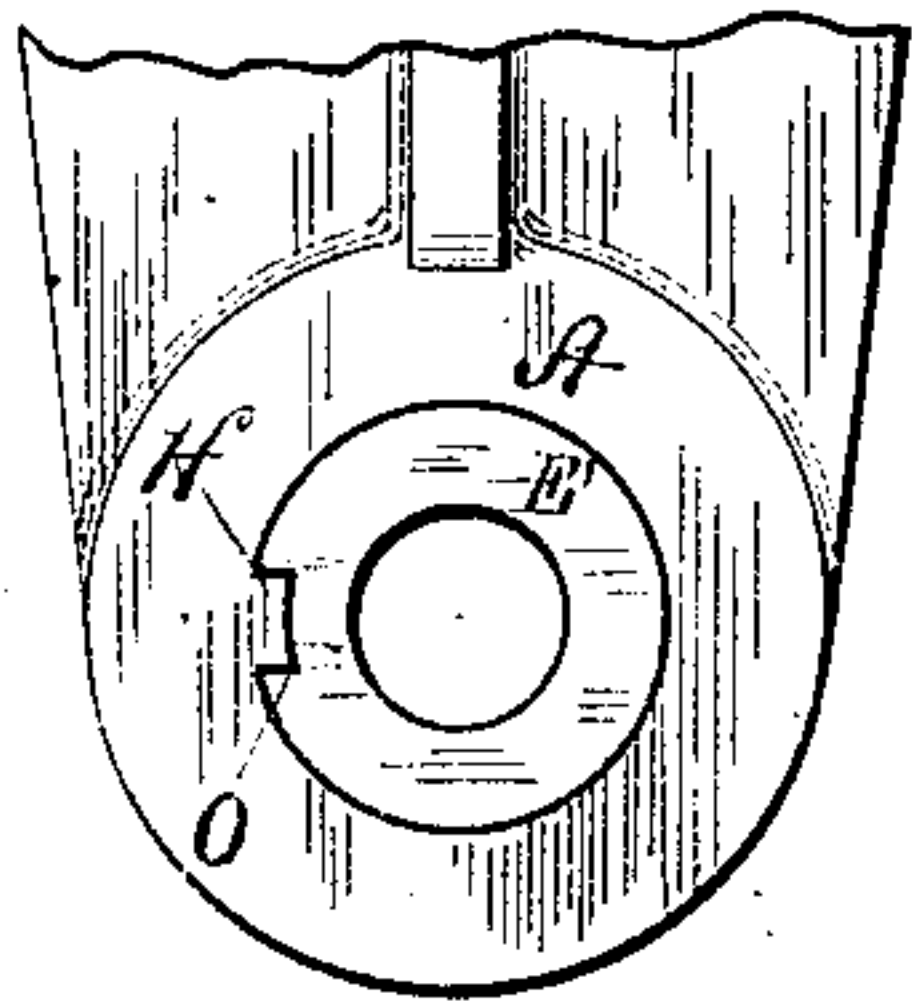
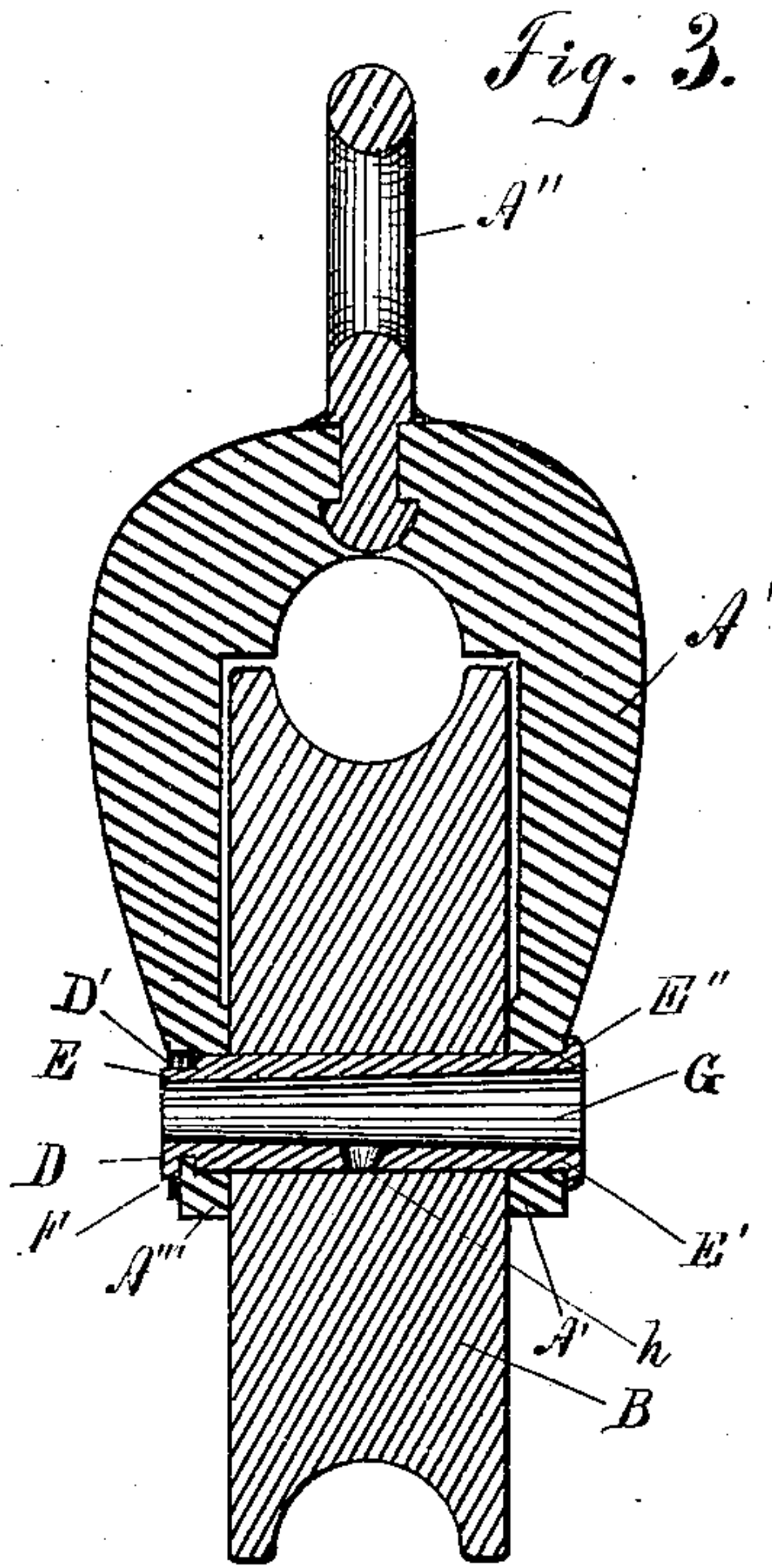
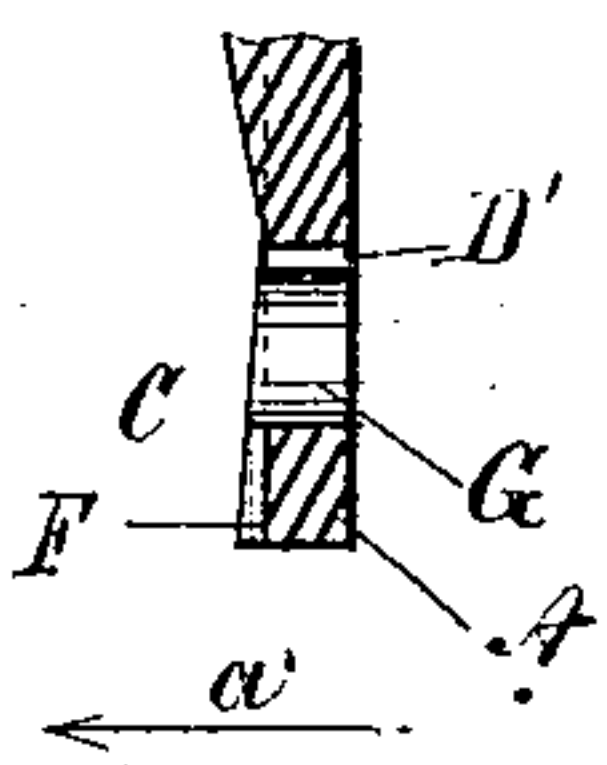
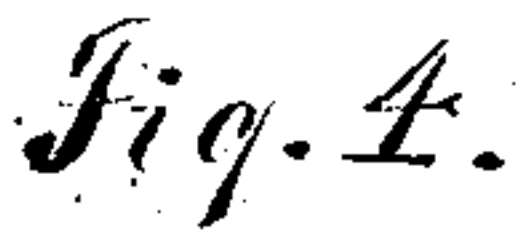
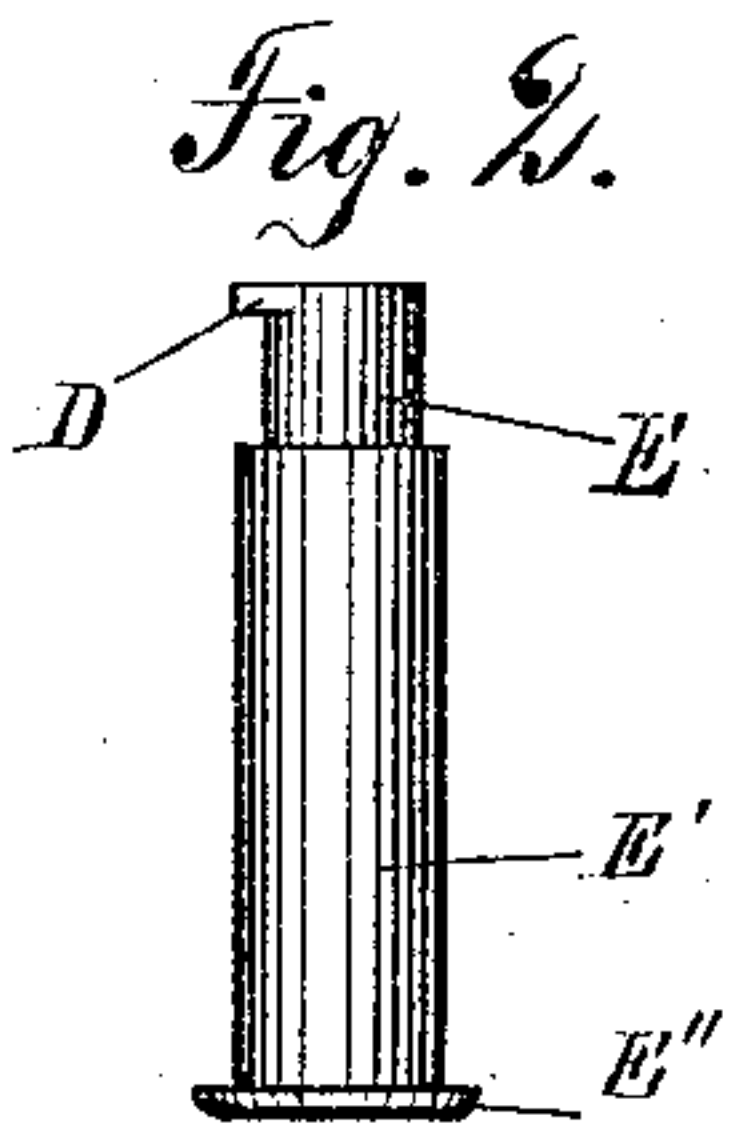
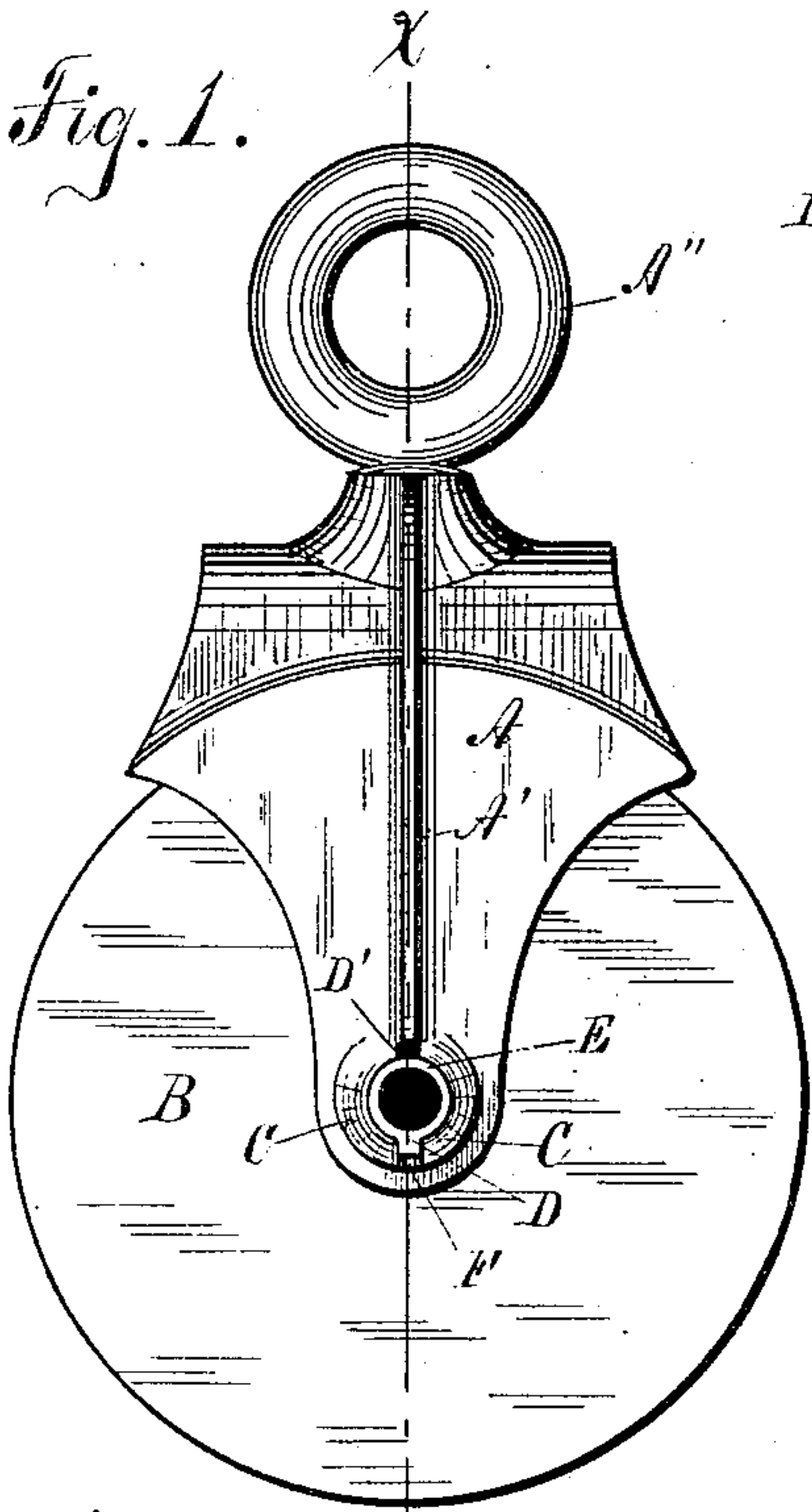
(No Model.)

F. S. TAGGART.

## PULLEY BLOCK.

No. 313,553.

Patented Mar. 10, 1885.



WITNESSES:

L. M. Currier  
J. Herain

INVENTOR

Francis J. Taggart  
BY

Wiles <sup>and</sup> Greene  
ATTORNEYS



# UNITED STATES PATENT OFFICE.

FRANCIS S. TAGGART, OF FREEPORT, ILLINOIS.

## PULLEY-BLOCK.

SPECIFICATION forming part of Letters Patent No. 313,553, dated March 10, 1885.

Application filed November 24, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCIS S. TAGGART, a resident of Freeport, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in Pulley-Blocks; 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 pertains to make and use the same.

My invention relates to improvements in pulley-blocks, and is fully set forth, described, and claimed in the following specification, and shown in the accompanying drawings, in which—

Figure 1 is a side elevation of a complete pulley-block with the parts in working position; Fig. 2, an elevation of the spindle on which the pulley turns; Fig. 3, a transverse section of the complete pulley-block, the plane of section passing through the line  $xy$ , Fig. 1; Fig. 4, a section of the ear  $A'''$ , through the line  $xy$ , Fig. 1, the view of the ear being the same as in Fig. 3, but with the spindle removed; Fig. 5, a side elevation of an ear and a spindle of slightly different form in position therein; Fig. 6, a side elevation of the form of spindle the end of which is shown in Fig. 5; Fig. 7, a transverse section of said spindle through the line  $x'y'$ , Fig. 6; and Fig. 8, an end view of the spindle, looking in the direction indicated by the arrow  $a''$ , Fig. 6.

In Figs. 1, 2, 3, 4,  $A$  is an ordinary block or hanger whose side plates are preferably strengthened by central ribs,  $A'$ , and  $A''$  is a swivel-eye cast in the block and turning freely therein.

$B$  is a sheave or pulley of usual form through whose center passes a preferably hollow supporting-spindle,  $E'$ , on which it turns. This spindle consists of a cylindrical portion,  $E'$ , of substantially the same diameter as the central bore of the sheave, a head,  $E''$ , on one end of the part  $E'$ , a reduced cylindrical portion,  $E$ , on the opposite end of the part  $E'$ , and a spline or feather,  $D$ , on the periphery of the reduced portion  $E$ , and at the extreme end thereof.

In one of the ears,  $A^{iv}$ , of the block  $A$  is a circular opening of the same diameter as the main part  $E'$  of the spindle, and through this opening and the central bore of the sheave may be readily passed the feather  $D$  and the

main part of the spindle, the head  $E''$ , however, being of a diameter too great to pass through the opening in the ear. In the other ear,  $A'''$ , of the block is a circular opening of the same diameter as the reduced portion  $E$  of the spindle; and at one point in the margin of the circular opening is a notch,  $D'$ , of such size and shape as to permit the feather  $D$  to pass through it when in proper position.

In the inner face of the ear  $A'''$  is a socket, concentric with the circular opening therein, but of the same diameter as the main part  $E'$  of the spindle; and the length of the part  $E'$  is such that when the head  $E''$  is in contact with the outer face of the ear  $A^{iv}$  the opposite end of the part  $E'$  enters the socket in the ear  $A'''$ . On the outer face of the ear  $A'''$  are two semi-annular cam-faces,  $C$ , each of which lies on the margin of the circular opening in the ear, and extends from the notch  $D'$  nearly one hundred and eighty degrees about said opening. Each of the cam-faces  $C$  is thinnest at the margin of the notch  $D'$ , and increases gradually in thickness from the notch  $D'$  toward a depression,  $F$ , diametrically opposite the notch. The depression  $F$  is of such width as to receive the feather  $D$ , and its sides, while not at right angles to the face of the ear, have a much more abrupt slope than the gradual rise of the faces of the cams  $C$ . The length of the spindle  $E E'$  between the inner face of the head  $E''$  and the inner face of the feather  $D$  is such that when the feather is passed through the notch  $D'$  and the head  $E''$  is in contact with the ear  $A^{iv}$  the inner face of the feather will lie in the plane of the outer face of the ear  $A'''$ . If the spindle be turned in either direction, the feather  $D$  moves over one of the cam-faces  $C$  and gradually springs the ears  $A''' A^{iv}$  closer together until it reaches the depression  $F$ , when it drops into the depression, and the ears spring apart and into their normal position. When in the depression  $F$  the feather is secured against accidental turning, and thus guards against accidental displacement of the spindle; but the sides of the depression are sufficiently oblique that the direct application of force to the spindle will move the feather out of the depression, and bring it into position to be withdrawn through the notch  $D'$ .

To afford a convenient means for turning the spindle, I prefer to make the chamber



within it of non-circular form at the larger end; but the same object may be reached by making the head polygonal.

In Fig. 8, which represents a slightly-different form of spindle, both expedients are combined, the head being square and the chamber oval in cross-section.

Figs. 5, 6, 7, 8 represent a preferably hollow spindle, whose body is of uniform diameter through its entire length, a head, P, being formed on one end of the body, however, and the office of the head being the same as that of the head E' of the spindle above described. In the end of the spindle opposite the head is a longitudinal slot, O, Figs. 5, 6, communicating with a spiral groove, K, extending partly around the spindle and farthest from the head at its junction with the slot O. At the opposite end of the slot K from the slot O is a notch, M, cut in that face of the slot which is farthest from the head. The openings in the ears of the block or hanger are both of the same diameter as the spindle; but on the margin of one of said openings is an inwardly-projecting lug, H, Fig. 5, of such size as to readily enter and pass along the slots O K and the notch M. The operation of this device is the same as that of the form shown in Figs. 1 to 4. The spindle is introduced by turning it into such a position that the lug H and slot O coincide. The lug enters the slot O and the end of the slot K. The spindle is then rotated in the direction indicated by the arrow on the body thereof in Fig. 6, when the lug passes along the slot K and drops into the notch M, where it is held by the spring of the side faces of the block or hanger.

I have shown and described these two forms of spindles as being types of two classes having substantially the same operation. It is evident that many variations in detail may be made in these self-locking spindles; but in all of them a lug or projection of some sort must co-operate with a corresponding groove, notch, or slot, the lug being on the spindle and the notch in the hanger, or vice versa. I do not desire, therefore, to limit the self-locking feature of my invention to the use of the particular forms shown.

I have said that the spindles shown are preferably hollow. It is evident that they would operate precisely the same if solid, but the hollow form gives greater strength and greater bearing-surface for the same weight of material, and is therefore to be preferred. The matter of surface is very important in the operation of these pulley-blocks, since the wear of the wooden sheave on a small spindle such as is ordinarily used is much more rapid than on the large bearings shown in these drawings. Another advantage which may be taken of the hollow form of spindle is illustrated in Fig. 3, in which the shell of the spindle is perforated at a point near the center of the sheave to form an oil-hole, h, through which oil may be introduced for lubricating the sheave to the best advantage.

The spindle shown and described herein may be used as a clevis-pin, if desired, the size being altered to suit the strength required. In fact, if the sheave be removed the hanger is substantially in the form of a clevis.

In both the forms of spindle shown and described the rotation of the spindle after its insertion in the hanger springs together the cheek-pieces, and this spring is released when the spindle reaches its working position. The parts may, however, be so changed in form that the rotation of the spindle will not spring together the cheek-pieces, thus making it necessary to spring them together by some other means, in order to permit the turning of the spindle into working position. For instance, if the cams C C, Fig. 1, be replaced by two lugs having vertical or abrupt side faces, the feather D of the spindle could only reach the depression D' when the side faces were sprung together, and yet the rotation of the spindle would not of itself spring them.

One principal object of the combination of the lug D and the depression D', Fig. 1, or of the corresponding devices shown in Figs. 5, 6, 7, is to prevent rotation of the spindle, not only to guard against accidental displacement thereof, but to bring the wear of the parts on the sheave and not on the bearings of the spindle in the hanger. This object may be attained by substituting for the feather D a key or cotter passing through the outer end of the spindle and lying in the depression D'.

I am aware that rotation of the spindle has heretofore been prevented by the forming on one of the cheek-pieces of the hanger of a seat for the head of the spindle; but so far as I know the expedient of providing a groove or seat for the key or cotter in the opposite end or point of the spindle is new.

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

1. In a pulley-block, the combination, with the block and sheave, of a hollow spindle passing through and forming the axle of the sheave, and supported by the cheek-pieces of the block.

2. In a pulley-block, the combination, with the block and sheave, of a hollow spindle passing through and forming the axle of the sheave, and supported by the cheek-pieces of the block, said hollow spindle being perforated at a point within the bearing-surface of the sheave to permit the lubrication of the sheave through such perforation, substantially as shown and described, and for the purpose set forth.

3. The combination, with a pulley block or hanger having suitable openings in its cheek-pieces, and a groove or depression in the outer face of one of said cheek-pieces, of a spindle adapted to enter said openings, and a key or its equivalent formed upon or attached to one end of said spindle, and adapted when the spindle is in working position to lie in said groove or depression and thereby to prevent the turning of the spindle.

4. In a pulley-block, the combination, with



a block or hanger having suitable openings in its cheek-pieces, of a spindle adapted when out of working position to be inserted in said openings and after being so inserted to be brought into working position, the cheek-pieces of the block being sprung together to permit the bringing of the spindle into working position, but allowed to resume their normal distance when the spindle reaches such working position.

5. In a pulley-block, the combination, with a block or hanger having suitable openings in its cheek-pieces, of a spindle adapted when not in working position to be inserted in said openings and after such insertion to be rotated into working position, the cheek-pieces of the block being sprung together during the rotation of the spindle, but resuming their normal distance when the spindle reaches its working position.

6. In a pulley-block, the combination, with a block or hanger having suitable openings in its cheek-pieces, of a spindle adapted when not in working position to be inserted in said openings and after such insertion to be rotated into working position, springing the cheek-pieces of the block together during such rotation, but allowing them to resume their normal distance upon reaching its working position.

7. In a pulley-block, the combination, with a block or hanger having circular openings in its cheek-pieces and a notch or slot at the margin of one of said openings, of a spindle provided with a peripheral lug or feather at one end, said spindle being adapted when said lug is brought into coincidence with said notch to be inserted in said openings and after such insertion to be rotated, carrying said lug away from said notch, thereby guarding against accidental displacement.

8. The combination of the block or hanger A, having circular openings in its cheek-pieces, and in one of said cheek-pieces a slot, D', on the margin of the circular opening, and a cam, C, and depression, F, on the face thereof, with the spindle shown and described, and consisting of the head E', body E', reduced portion E, and feather D, all combined and operating substantially as shown and described, and for the purpose set forth.

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

FRANCIS S. TAGGART.

Witnesses:

U. M. MAYER,  
L. M. CURRIER.