

No. 774,870.

PATENTED NOV. 15, 1904.

T. R. FERRALL.  
BLOCK.

APPLICATION FILED APR. 3, 1903.

NO MODEL.

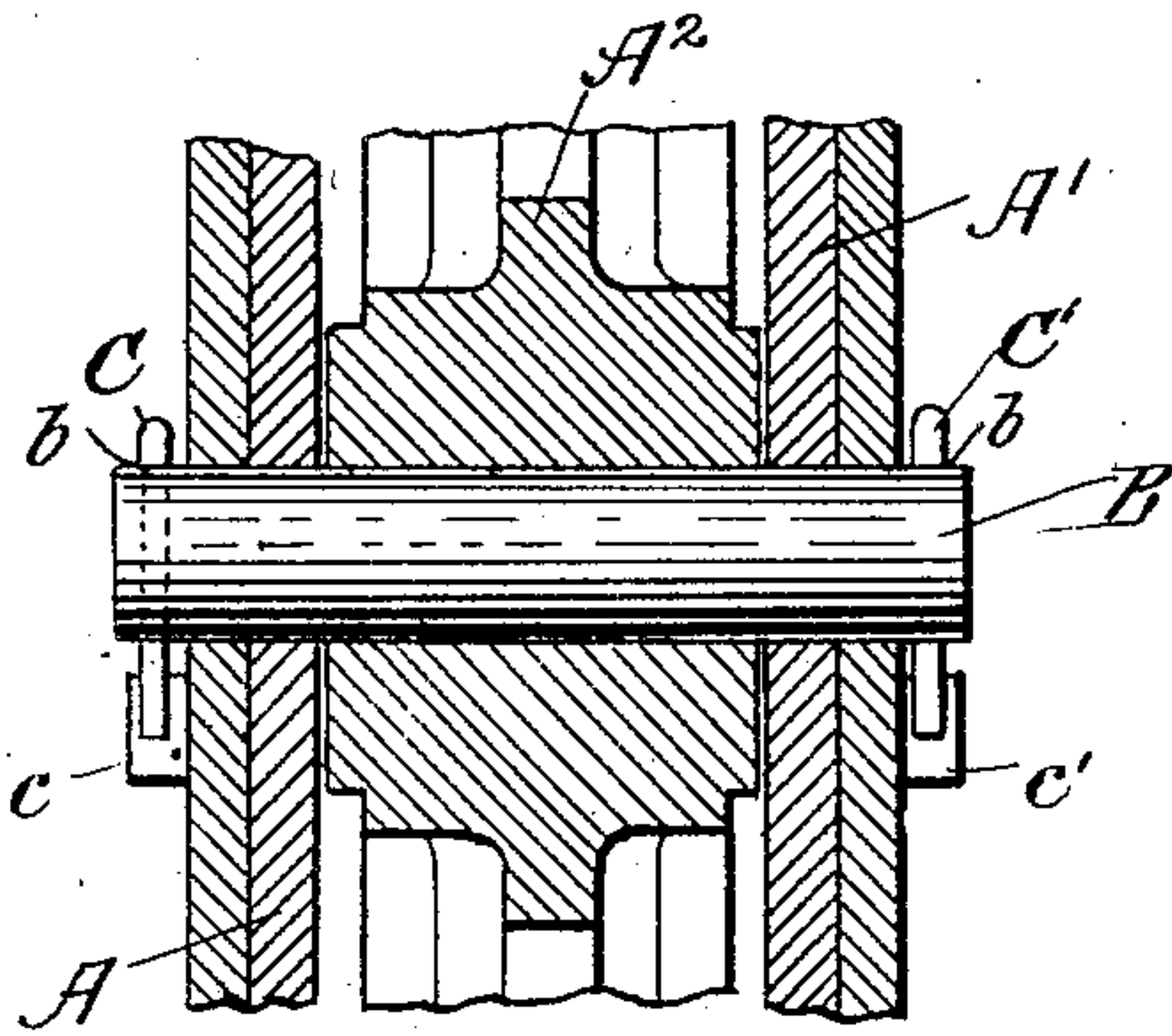


Fig. 1.

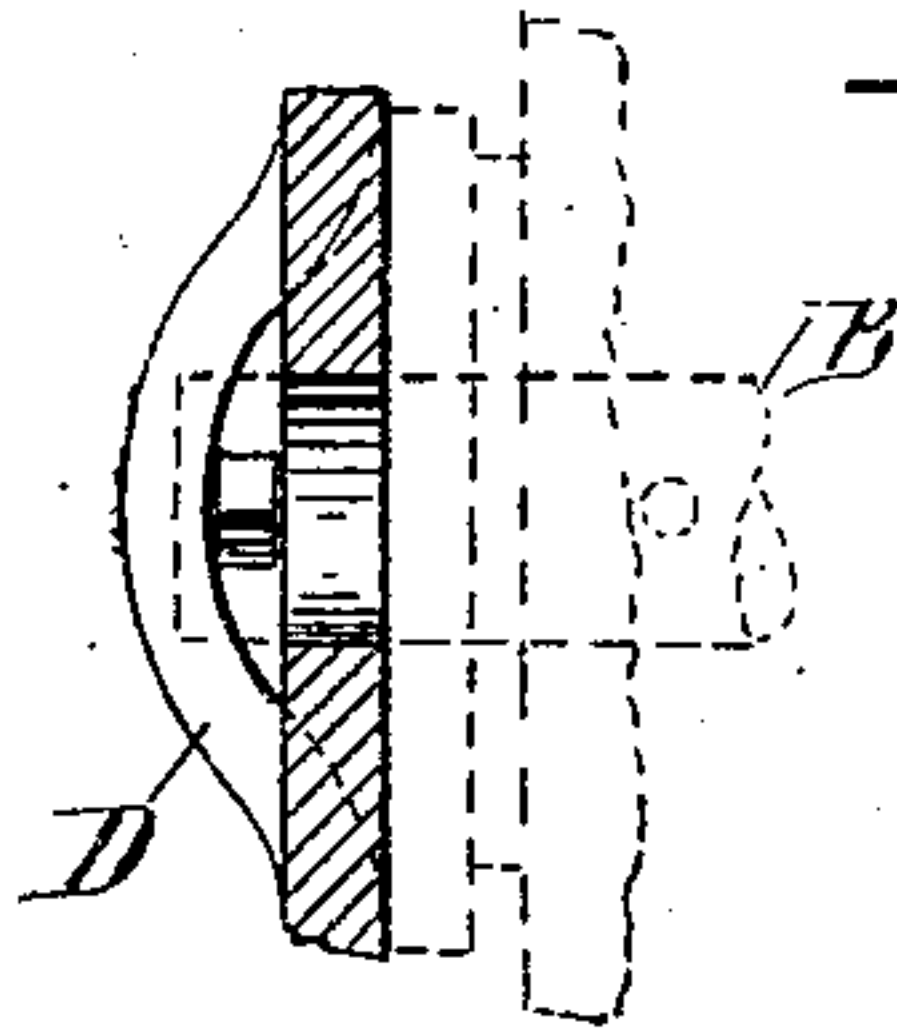


Fig. 3.

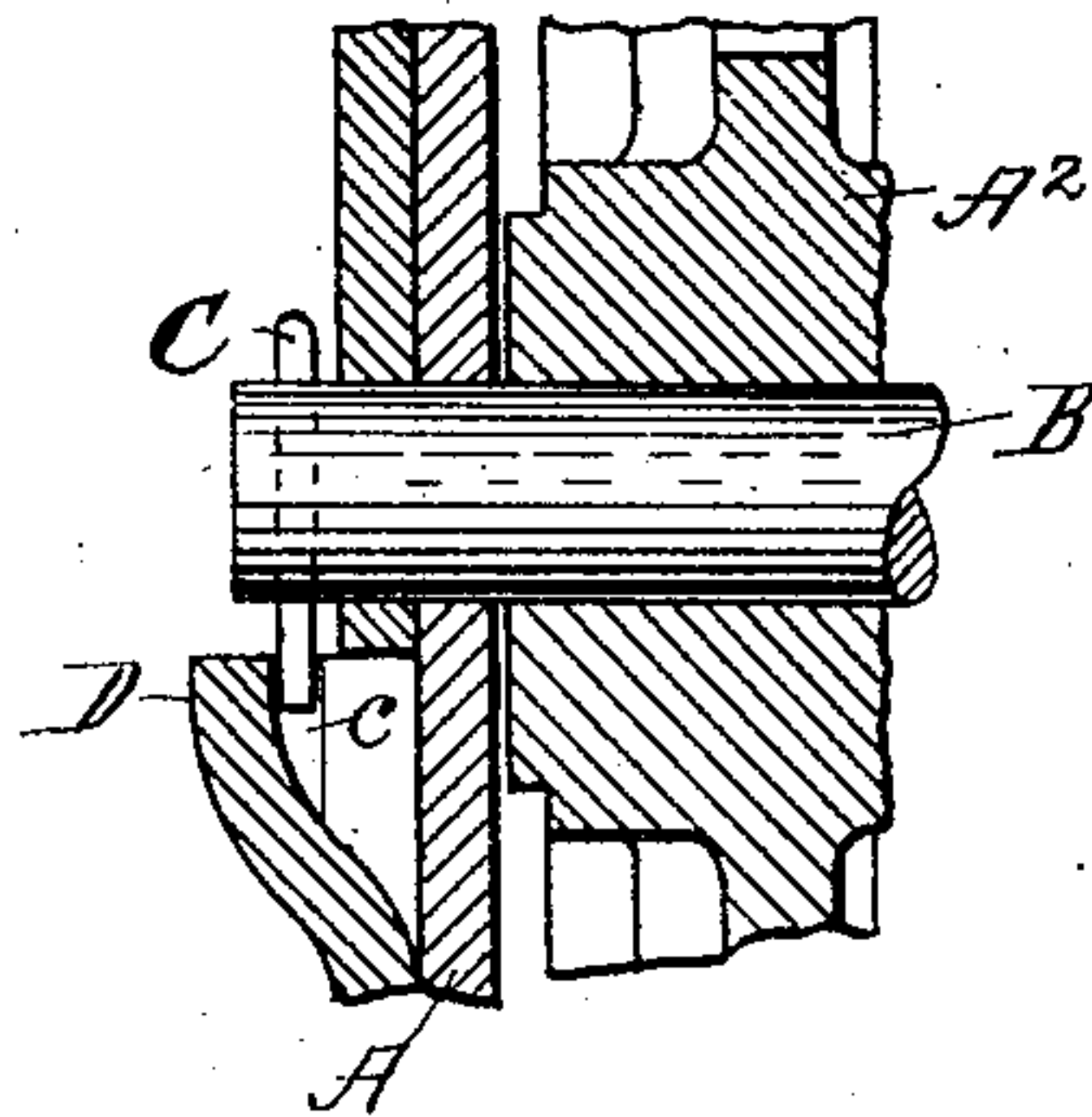


Fig. 2.

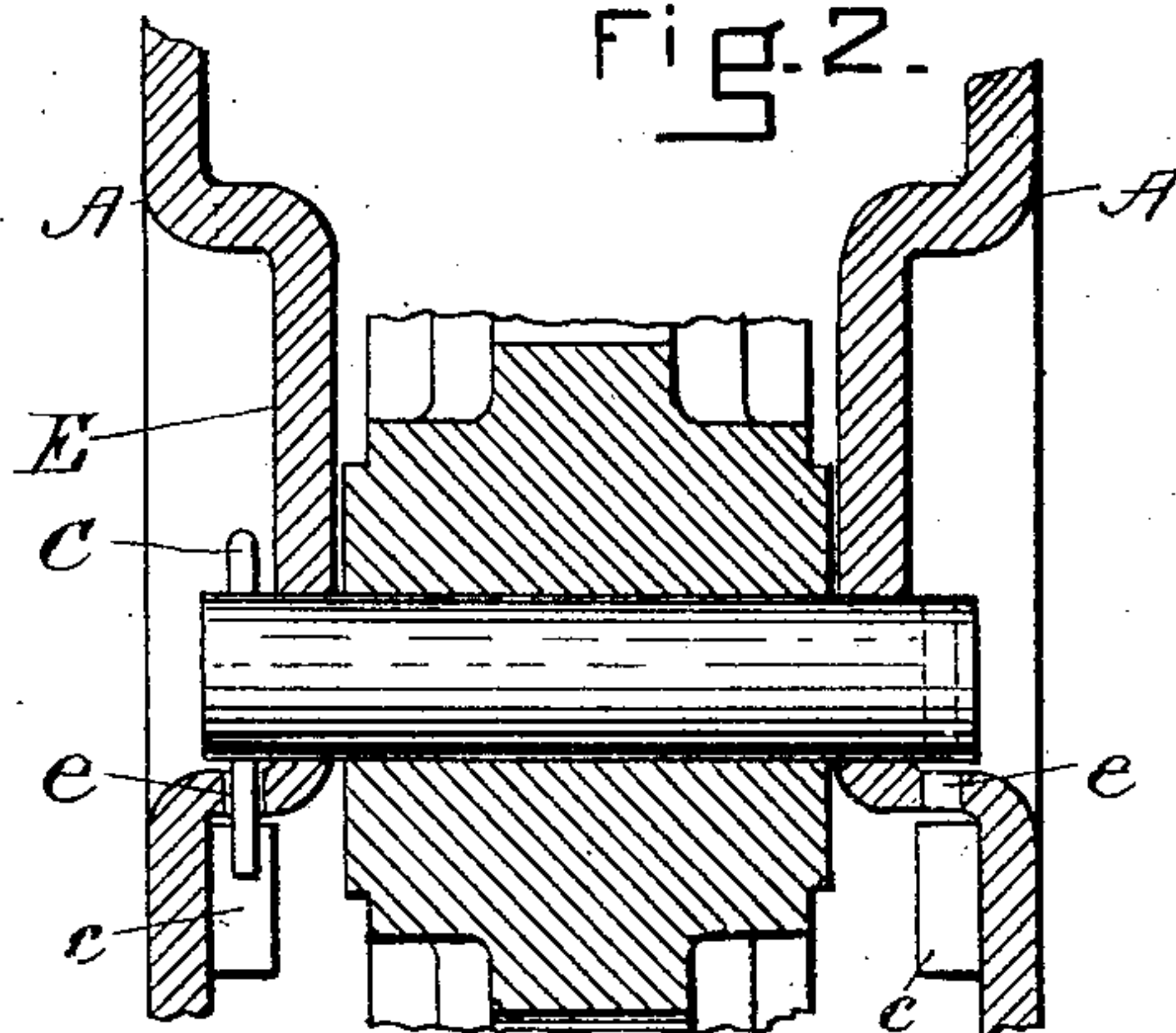


Fig. 4.

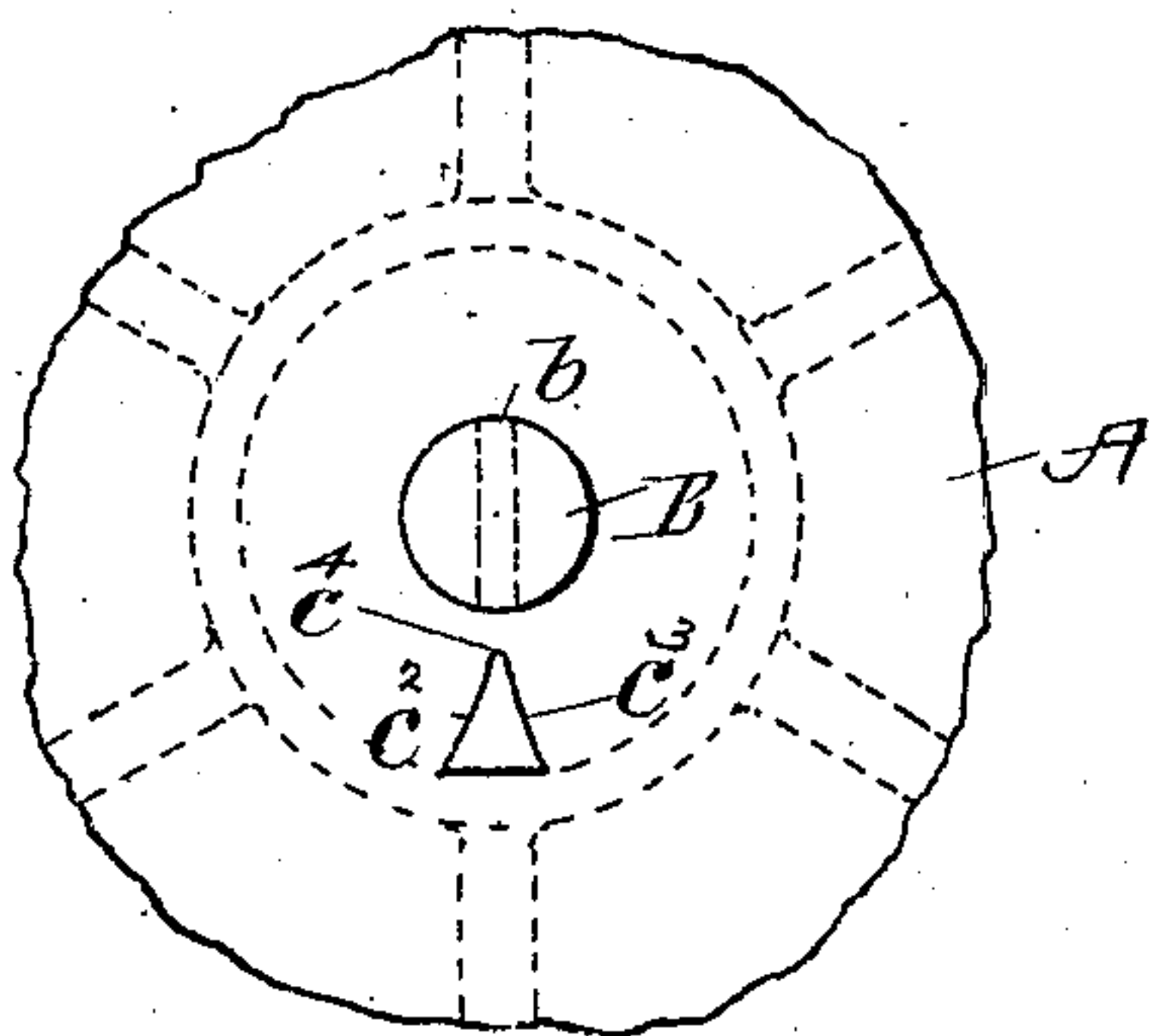


Fig. 5.

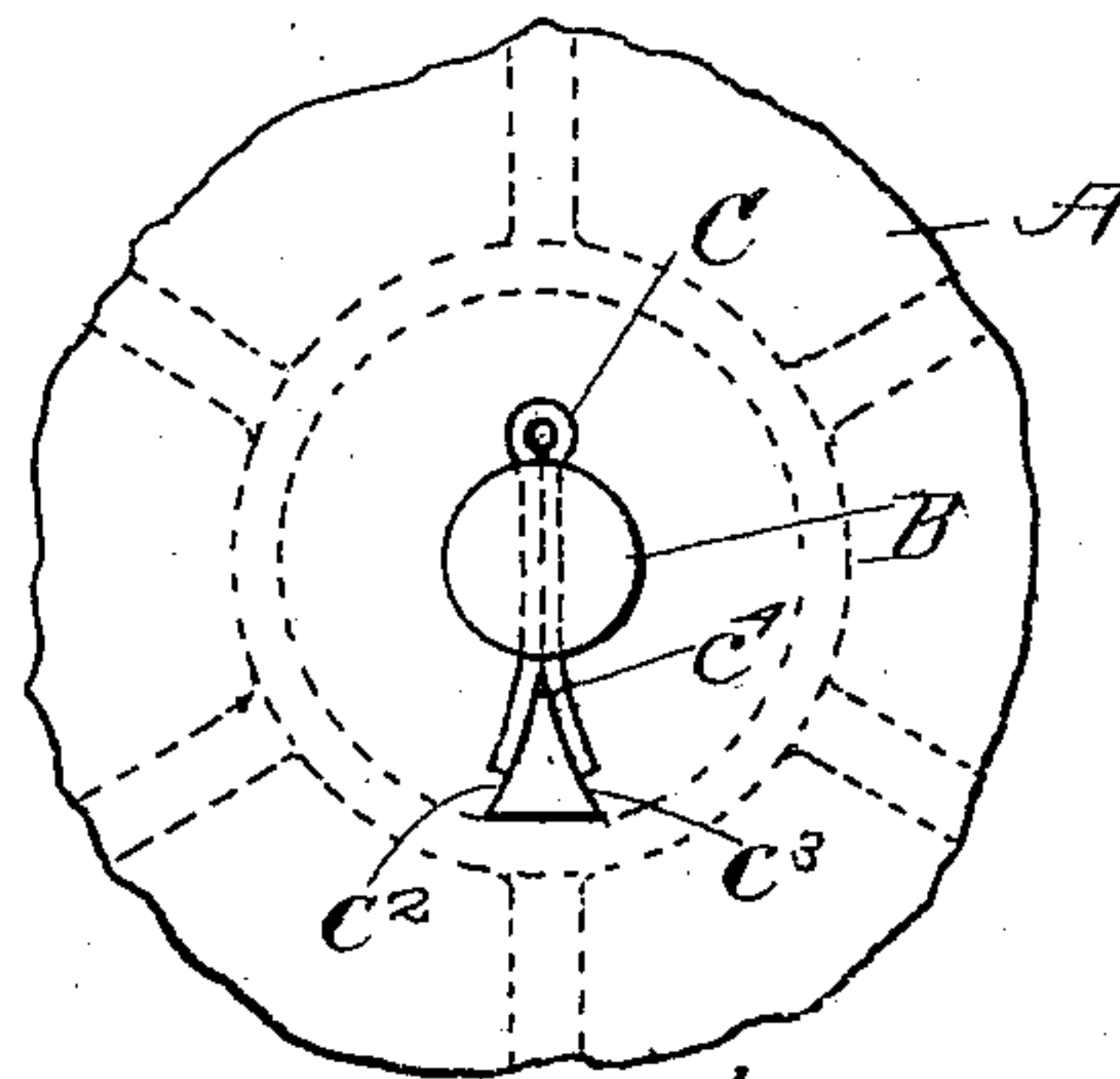


Fig. 6.

WITNESSES

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# UNITED STATES PATENT OFFICE.

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## BLOCK.

SPECIFICATION forming part of Letters Patent No. 774,870, dated November 15, 1904.

Application filed April 3, 1903. Serial No. 150,978. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS R. FERRALL, a citizen of the United States, and a resident of Wakefield, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Blocks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention relates to an improvement in blocks, and particularly to the sheave-stud and means for fastening it in place in the block and in a manner to prevent it from being turned by the sheave and also from being moved crosswise the sheave and block.

Heretofore sheave-studs have usually been provided with a head at one end and a threaded section at the other, which has received a fastening-nut, the head bearing against the outer surface of one side of the block and the nut screwing against the outer surface on the other side of the block. To prevent the turning of the stud in the block, it has sometimes had a projection from or near its head, which entered a holding-recess in the block adjacent to the head or in a strap, if one be used. This form of stud and connection is not desirable, in that in order to form the head the stud, which is made of cold-rolled stock, has to be heated, and the finish of that part upon which the sheave bears, which would otherwise form a desirable bearing, is more or less roughened, softened, and injured thereby, while the connection for preventing its turning (though not always used) is relatively expensive to apply and not altogether effective mechanically.

By my improvement the heating of the sheave-stud is dispensed with, its heading is rendered unnecessary, and the screw-thread and nut are not required. Neither is any machine-work necessary, the stud being formed by cutting from the cold-rolled rod and being completed by simply having a pin-hole formed across it near one or both ends. The stud so prepared does not have its smooth hardened surface injured, thus providing the best bear-

ing possible for the sheave. Neither is more stock used in making the stud than is necessary to give it suitable length, the stock being preferably less than is required when the pin is headed and provided with a threaded end for receiving a nut.

The sheave-stud may be fastened by two pins, one at each end, or by one, and whichever form is employed the block is so constructed that the act of driving the pin causes it to be automatically secured in place not only to the stud, but to the block itself, so that it serves to prevent the stud from moving crosswise the block and also to prevent the stud from being turned in its supports in the block by the rotation of the sheave upon it. This provision for preventing the turning of the sheave-stud is especially desirable in sheaves having thin sides forming narrow supports for each end of the sheave-stud, for it is in blocks of this construction that the sheave-studs, if not prevented, are turned by the sheave, and thus caused to enlarge the holes in the sides which receive them and to make the sheave run hard or irregularly.

I will now describe the invention in conjunction with the drawings forming a part of this specification, where—

Figure 1 is a view in vertical section of the central portion of a block having the features of my invention. Fig. 2 is a similar view of one side of the central portion of the block, representing a slight modification in the embodiment of the invention. Fig. 3 is a detail view, principally in plan, of parts represented in Fig. 2 to further illustrate it. Fig. 4 is a view in vertical section of the central part of a block to illustrate a further modification of my invention. Fig. 5 is a view in side elevation of Fig. 1 without the cotter-pin. Fig. 6 is a view in side elevation of Fig. 1 with the cotter-pin.

The block sides A A' and the sheave A<sup>2</sup> may be of any usual construction. The sides in Figs. 1, 2, and 3 indicate a strap construction.

B is the sheave-stud. It is of the same diameter throughout its length, and in Fig. 1 it is represented as having near each end a



pin-hole *b*. Upon each block side in Fig. 1, immediately beneath the sheave pin-hole therein, is a device for locking to the sheave-stud and to the block sides the pins which fasten the sheave-stud in place. These devices are formed integral with the sides or straps and expose one or more inclined surfaces to the thrust of the locking-pins. I prefer where a cotter-pin is used for the locking-pin to make such locking device with two inclined surfaces which extend downward and outward from a point near each sheave-hole and in line with its central plane and so that the ends of the cotter-pins upon leaving their holes in the sheave-stud shall immediately come into contact with the upwardly-presented edge and be by it separated or divided into two parts, which shall then ride upon the oppositely-arranged inclined surfaces of the locking and holding device and be turned outward by them.

In Fig. 1, *CC'* are the cotter-pins. *c c'* are the pin bending and locking devices, each of which has the inclined surfaces *c<sup>2</sup> c<sup>3</sup>* arranged to extend downward and outward from the upper end *c<sup>4</sup>* (see Fig. 5) and each of which devices is arranged with respect to the above sheave pin-hole in the block side and to the pin-hole in the sheave-stud, as represented in Figs. 1, 5, 6, and 7. The locking device thus serves to head the cotter-pin while it is being driven by turning outwardly its divided ends, and it also serves after the pin has been driven in to form a rigid connection between it and the block side, which serves to hold the sheave-stud from turning.

While I have represented a cotter-pin as the means for locking the sheave-stud, I would say that a pin which is not divided at its heading end may be used, in which case the locking device would have but a single incline and would be set a little one side of the central plane of the sheave pin-hole, so that it would act as a deflecting-surface for the end of the pin. In this event the inclination of the locking device upon one side would need to be opposite that of the device on the other side and so that one would serve to prevent the turning of the sheave-stud in one direction, while the other would serve to prevent the turning of the sheave-stud in the opposite direction.

In Figs. 3 and 4 a structure is shown in which a single pin serves to prevent lengthwise movement of the sheave-stud.

In Figs. 2, 3, and 4 a construction is shown in which a single locking-pin serves to hold the sheave-stud from a crosswise movement in the block and also from turning. This result is obtained by forming the block side or strip so that it may have upon the side of the block where the pin is employed a surface or stop in opposed relation to the side. This may be accomplished by forming a bow to extend outward from the side, as represented in Figs.

2 and 3, or by forming a cavity in the block side, as represented in Fig. 4, and so that a portion of the side shall have a part of its length parallel with the sheave-stud and have a hole therein with which the pin may engage the side. In both cases the pin-bending device, which in Figs. 2, 3, and 4 is also a locking device to prevent turning, is upon the inside of the block side instead of upon the outside, as represented in Figs. 1, 5, and 7.

In Figs. 2 and 3, *D* represents the part of the side which acts as a stop in conjunction with the locking-pin *C* of the sheave-stud in preventing movement of the sheave-stud in an outward direction in the block, while the side of the block acts as a stop in preventing its inward movement. The pin bending and locking device is similar to *c* of Figs. 1, 5, and 6 and acts in the same way, but is located upon the inside of the bow *D*, as specified, the bow forming an opening by means of which the locking-pin reaches the spreading and locking device. In Fig. 4 the same result is reached by providing each block side with the deep cavity *E*, extending inward from its outer side. Each end of the sheave projects into a cavity, and immediately adjacent to the sheave-stud hole the block side extends parallel with the stud, and in this parallel portion is a hole *e*, through which the locking-pin of the sheave extends. The sides of this hole furnish stops for preventing longitudinal movement of the sheave-pin, in this respect being like the structure of Figs. 2 and 3, and it also serves, further, to prevent a turning movement of the sheave-stud.

The pin heading or spreading device *c*, which is below the hole *e* upon the inside of the block side, serves to turn or head the locking-pin, as in Figs. 1 and 2, but does not serve to prevent the turning of the sheave-stud, as in the construction of the said figures.

The block of Fig. 4 is constructed so that the sheave-stud locking-pin may be used upon either side at will, or, if it is preferred, two locking-pins may be employed.

In using the terms "bending," "heading," or "spreading" in connection with the action of such a device as the part *c c'* I mean to be understood as referring to any form of upsetting or bending action by means of which the end or ends of a fastening-pin may be so spread that it may not withdrawn or work out from the hole in the stud. Moreover, in the drawings, while I have referred to the device as an improvement in "blocks," it will be noted that the entire block is not shown, by which I mean to emphasize the fact that this invention is not limited solely to use in blocks, but may be used wherever a stud is desirable and it is desirable to keep the stud from turning for the purpose of preventing wear to the bearings or for any other purpose.

I am aware that spreading or bending devices mounted on a washer have been used to



spread a split cotter-pin, and I do not claim such spreading or bending device as such.

Having thus fully described my invention, I claim and desire to secure by Letters Patent 5 of the United States—

1. In a block a sheave-stud extending through the side thereof, a cotter-pin for securing said stud located on the outside and alongside said side, means for preventing the 10 endwise and rotary movement of said stud with respect to the side of the block through which it extends, the same consisting of a portion of said side of the block extended out laterally beyond the cotter-pin in said stud, 15 back of which portion of said side extending portion the cotter-pin is adapted to be contained and driven, and a spreading-lug upon the inside of said extending portion of the side in line with said cotter-pin for spreading 20 or diverging the ends thereof, substantially as and for the purposes set forth.

2. In a block a sheave-stud extending

through the side thereof, a cotter-pin for retaining the same located on the outside and alongside said side, means for preventing said stud 25 from turning and from an endwise movement with respect to said side, consisting of a cavity in said portion of the side of the block through which the stud extends and in which cavity the cotter-pin is adapted to be contained, the 30 portions of the block surrounding the cavity being outwardly offset, an opening in said side of the block, through which openingsaid cotter-pin may be driven to extend and be contained back of said offset portion of the side, and a 35 spreading-lug upon said offset portion of the side with which said cotter-pin is adapted to engage when driven, substantially as and for the purposes set forth.

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Witnesses:

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