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W. L. BLACK.

ANTIFRICTION DEVICE FOR SUCKER RODS OR THE LIKE.

(Application filed Mar. 25, 1902.)

(No Model.)

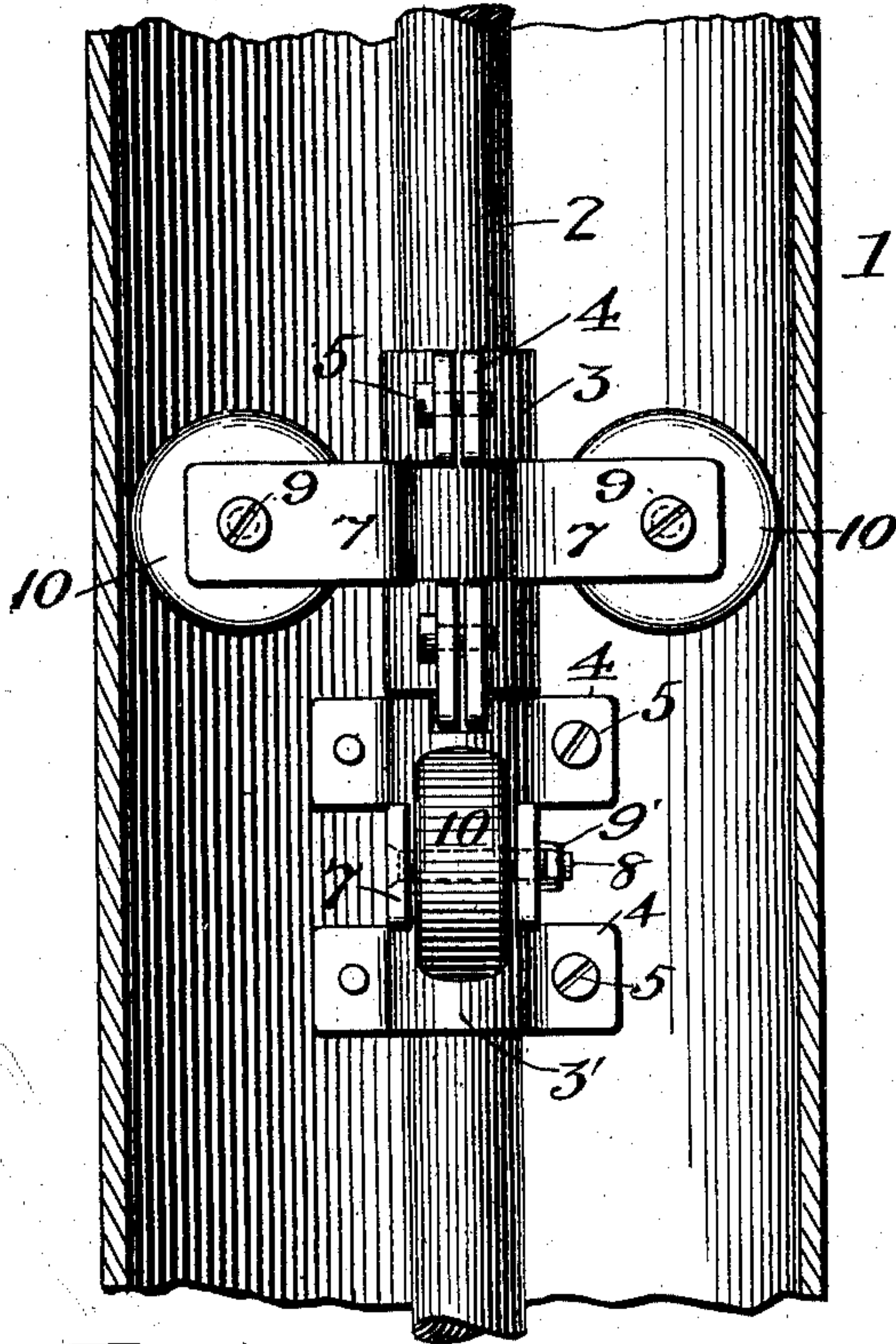


Fig. 1.

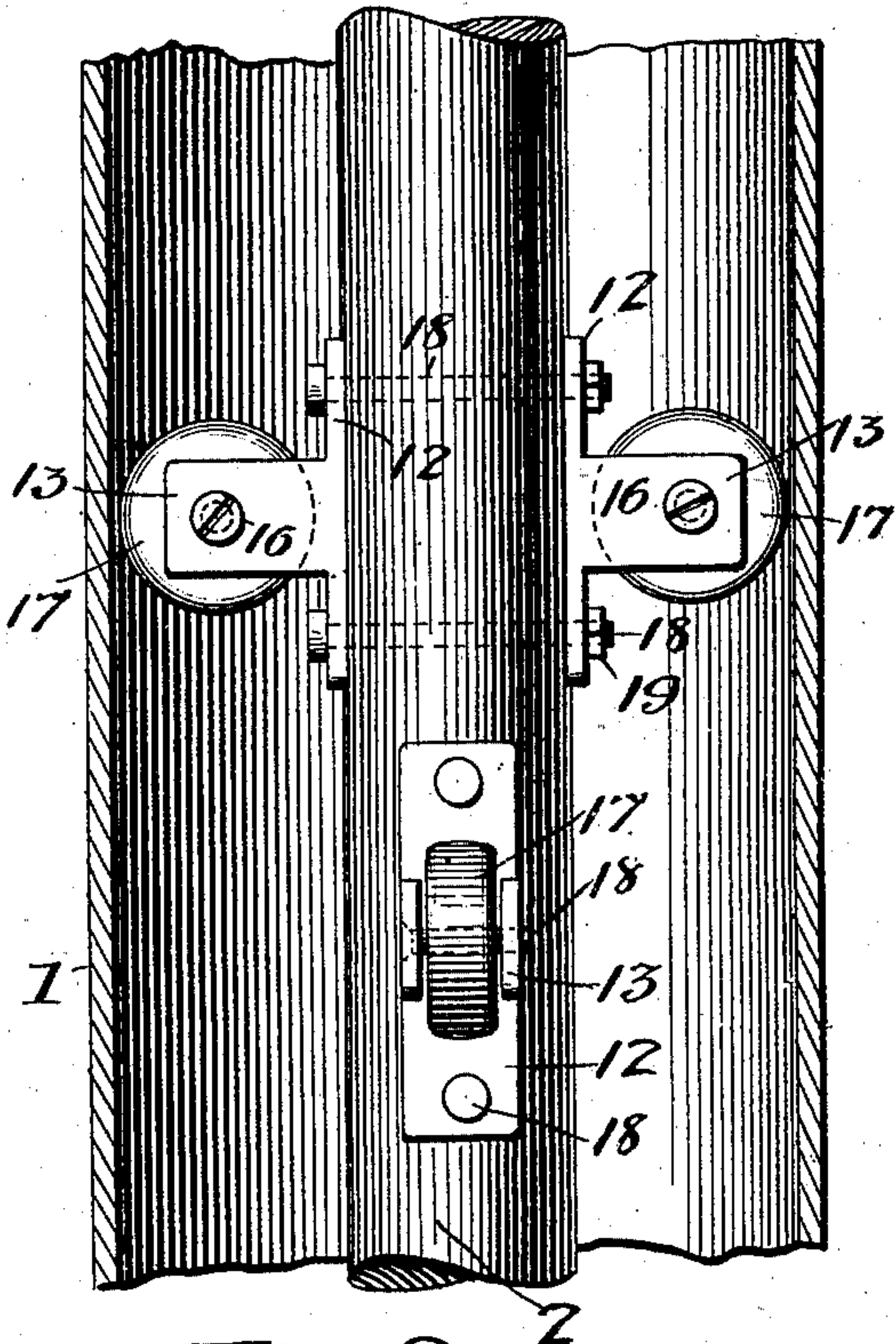


Fig. 2.

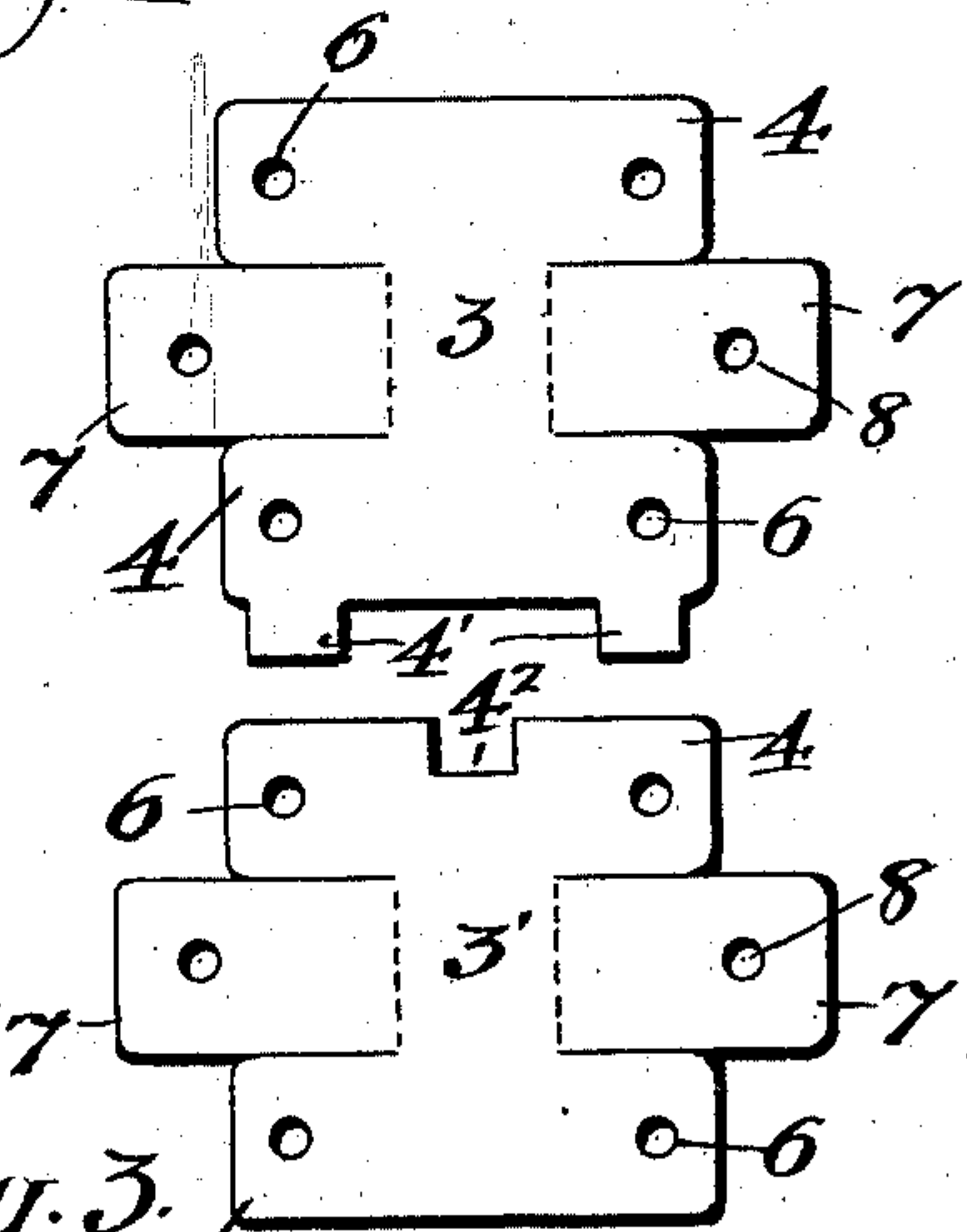


Fig. 3.

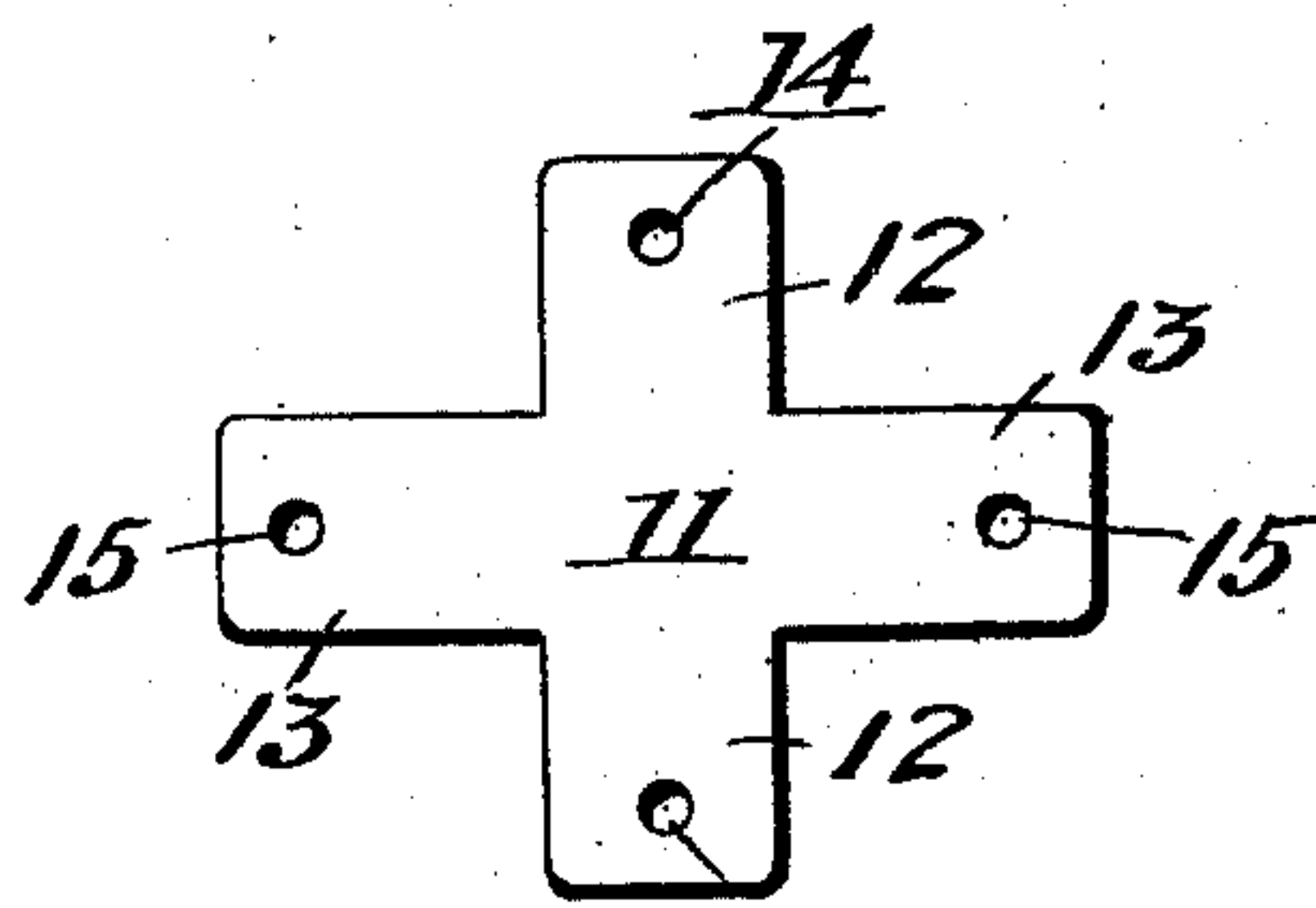


Fig. 4.

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UNITED STATES PATENT OFFICE.

WILLIAM L. BLACK, OF FORT MCKAVETT, TEXAS.

ANTIFRICTION DEVICE FOR SUCKER-RODS OR THE LIKE.

SPECIFICATION forming part of Letters Patent No. 712,488, dated November 4, 1902.

Application filed March 25, 1902. Serial No. 99,979. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. BLACK, a citizen of the United States, residing at Fort McKavett, in the county of Menard and State of Texas, have invented certain new and useful Improvements in Antifriction Devices for Sucker-Rods or the Like; 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 antifriction devices for sucker-rods and the like, and has for its object to provide an antifriction-roller with a simple form of mounting or support that may be manufactured at a comparatively low cost, that may be quickly and readily applied to the rod at any point, and that will serve when a number of them are attached in series throughout the length of the rod to maintain the rod in its central alinement in the well-casing and prevent it from bending or "buckling," and, furthermore, interpose a minimum obstruction to the flow of the liquid in the casing.

To this end my invention comprises an antifriction-roller mounted in a plate of metal provided with wings for securing it to the sucker-rod and having struck-up portions constituting journal-bearings for the roller.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section through a well-casing, showing two pairs of my improved antifriction devices attached to the sucker-rod. Fig. 2 is a similar view showing a modified form of mounting for the antifriction-rollers. Fig. 3 illustrates the blank from which the antifriction-mountings shown in Fig. 1 are formed, and Fig. 4 shows a blank employed as a mounting for the roller shown in Fig. 2.

Referring to the drawings, Figs. 1 and 3, 1 represents a well-casing of the usual type, which is formed of successive lengths of iron pipe joined by nipples or couplings, within which casing a sucker-rod 2, likewise formed of successive coupled lengths of metal or wood, reciprocates. In rods of this character it is desirable to dispose antifriction devices throughout the length thereof in order to maintain the rod in its central alinement

in the casing and prevent it from bending or buckling laterally in its downstroke, which bending or buckling would result in a shorter stroke of the pump and a corresponding reduction of the efficiency of the pump. It has been found necessary to apply antifriction devices to the sucker-rod in symmetrical relation about the rod, so as to oppose any deflection in a lateral direction, and to accomplish this object I propose to mount two sets of oppositely-disposed rollers in juxtaposition, each set occupying a position at right angles to the other, thereby providing a series of guides disposed about the rod, which will accomplish the desired object and at the same time interpose a minimum obstruction to the flow of the liquid in the casing.

I prefer to form my improved antifriction device with a base-plate 3, of metal, embracing approximately one-half of the sucker-rod, said plate being provided with wings 4, which when two such plates are brought into juxtaposition lie contiguous to each other and are adapted to be secured by screws 5, passing through suitable registering holes 6, whereby the said plates constitute a sectional collar securely clamped to the rod. Each of said metal plates is provided with two struck-up portions 7, with registering perforations 8, forming journal-bearings for a stud or pintle 9, upon which the antifriction-rollers 10 are mounted. The pintle 9 may be a simple form of bolt provided with a screw-threaded end to receive a suitable nut 9', or in lieu thereof I may employ a threaded bolt taking into suitable screw-threads provided in one of the perforations 8, a headed pintle with a cotter or key through one end, or a simple pin riveted at both ends. As thus applied my antifriction device comprises a sectional collar embracing the rod, having two antifriction-rollers projecting from opposite sides. As above explained, I prefer to employ the antifriction-rollers in double sets of two disposed at right angles to each other, and in order to preserve the relative position of the rollers I provide one set of the wings 4 with projections 4', which when the two clamps are in proper position engage with the corresponding recess 4² in the other clamp, as clearly illustrated in Fig. 1. It will be apparent that a single pair of antifriction-rollers may be applied, if de-

sired; but as the application of two sets, as illustrated, interposes little additional resistance to the flow of liquid in the tube, which takes a zigzag course about and between the rollers, I prefer the double arrangement shown.

In the modified form shown in Fig. 2 the metal plate 11, which I preferably form of a stamping from sheet metal, comprises two wings 12, having perforations 14, and two struck-up portions 13, provided with perforations 15 to receive the pintles or axles 16 of the rollers 17. This type of roller is preferable when the rod-sections are of wood, as they may be quickly applied to said rod-sections whether their contour be round or square. I also prefer to apply these antifriction-rollers in sets of two, with the rollers oppositely arranged, as illustrated, and to facilitate the ready attachment of the sets the rod-sections are provided with diametrical perforations registering with the perforations 14 in the wing-sections, and through the registering perforations bolts 18 are passed, which bolts are secured in position by nuts 19 or by riveting, whereby the antifriction devices are simultaneously rigidly secured in proper relation to the rod. I prefer to use this type of antifriction device likewise in two sets of two rollers each, the sets being disposed at right angles to each other in order to insure the proper alinement of the rod.

It is to be particularly noted that the antifriction devices may be applied to the rod at any point throughout its length in such relation to each other as will best subserve the object of keeping the rod in alinement and reducing the obstruction to the flow of the liquid. I have found, however, in practice that in the double arrangement of rollers, whereby the several rollers are disposed at angles of ninety degrees to each other about the rod, with the several sets so positioned throughout the length of the rod that the latter is maintained practically rigid during its reciprocation in the casing, the tendency of the rod to buckle is entirely obviated and the impedance to the

flow offered by the antifriction devices is minimized.

Having thus described my invention, what I claim is—

1. An antifriction device for sucker-rods, comprising an antifriction-roller, and a plate of metal provided with wings for securing it to the sucker-rod and having struck-up portions constituting journal-bearings for the roller and between which it is mounted; substantially as described.

2. An antifriction device for sucker-rods, comprising a pair of antifriction-rollers arranged on opposite sides of the sucker-rod, a plate of metal provided with wings, for each roller, said wings encircling the rod and being clamped upon the rod, and each plate having struck-up portions constituting journal-bearings for its roller and between which the roller is mounted; substantially as described.

3. An antifriction device for sucker-rods, comprising a pair of antifriction-rollers, another pair of antifriction-rollers arranged in a different vertical plane, the members of each pair being located on opposite sides of the sucker-rod, and each roller being mounted in journal-bearings which are formed by struck-up portions of a base-plate having clamping-wings, the clamping-wings of one of said base-plates engaging with a corresponding recess in the clamping-wings of the other base-plate; substantially as described.

4. An antifriction device for sucker-rods, comprising a pair of antifriction-rollers arranged on opposite sides of the sucker-rod, a plate of metal provided with wings, for each roller, each plate having struck-up portions constituting journal-bearings for the roller, and bolts passing through the corresponding wings of each plate to secure the plates to the rod; substantially as described.

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

WILLIAM L. BLACK.

Witnesses:

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