

No. 816,508.

PATENTED MAR. 27, 1906.

W. H. SNOW.
PARALLEL BENCH VISE.
APPLICATION FILED JULY 29, 1905.

Fig. 1.

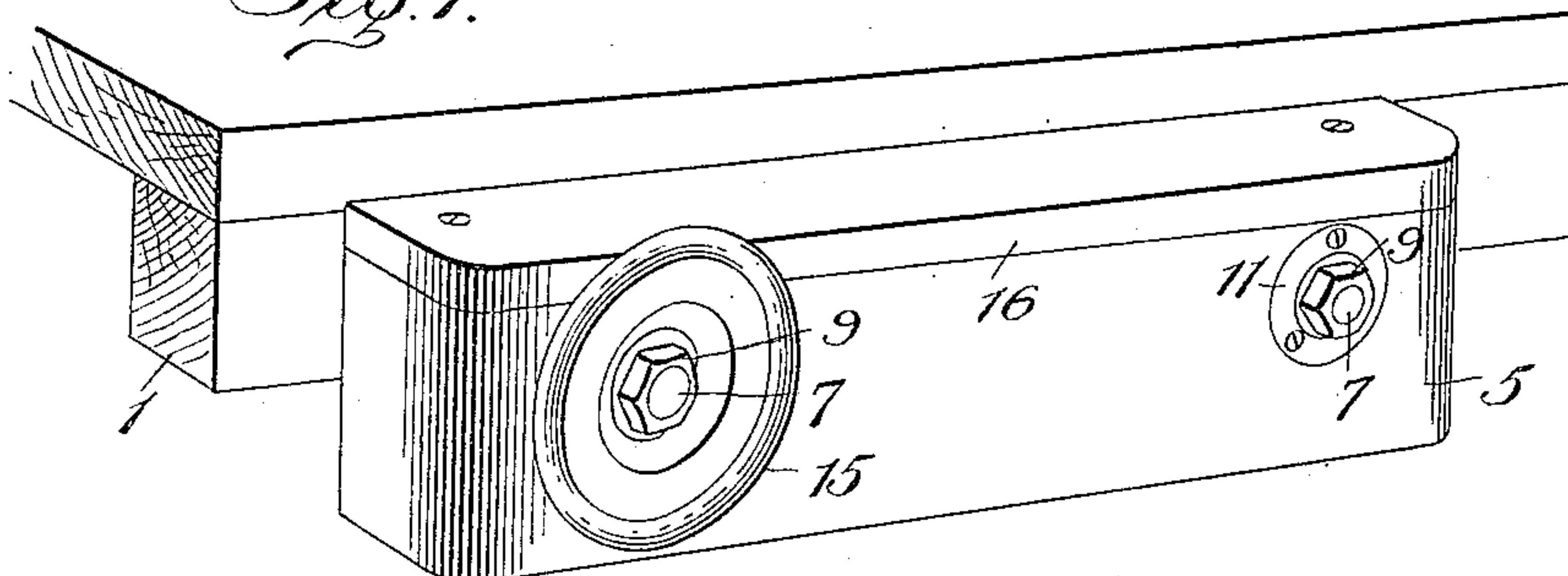


Fig. 2.

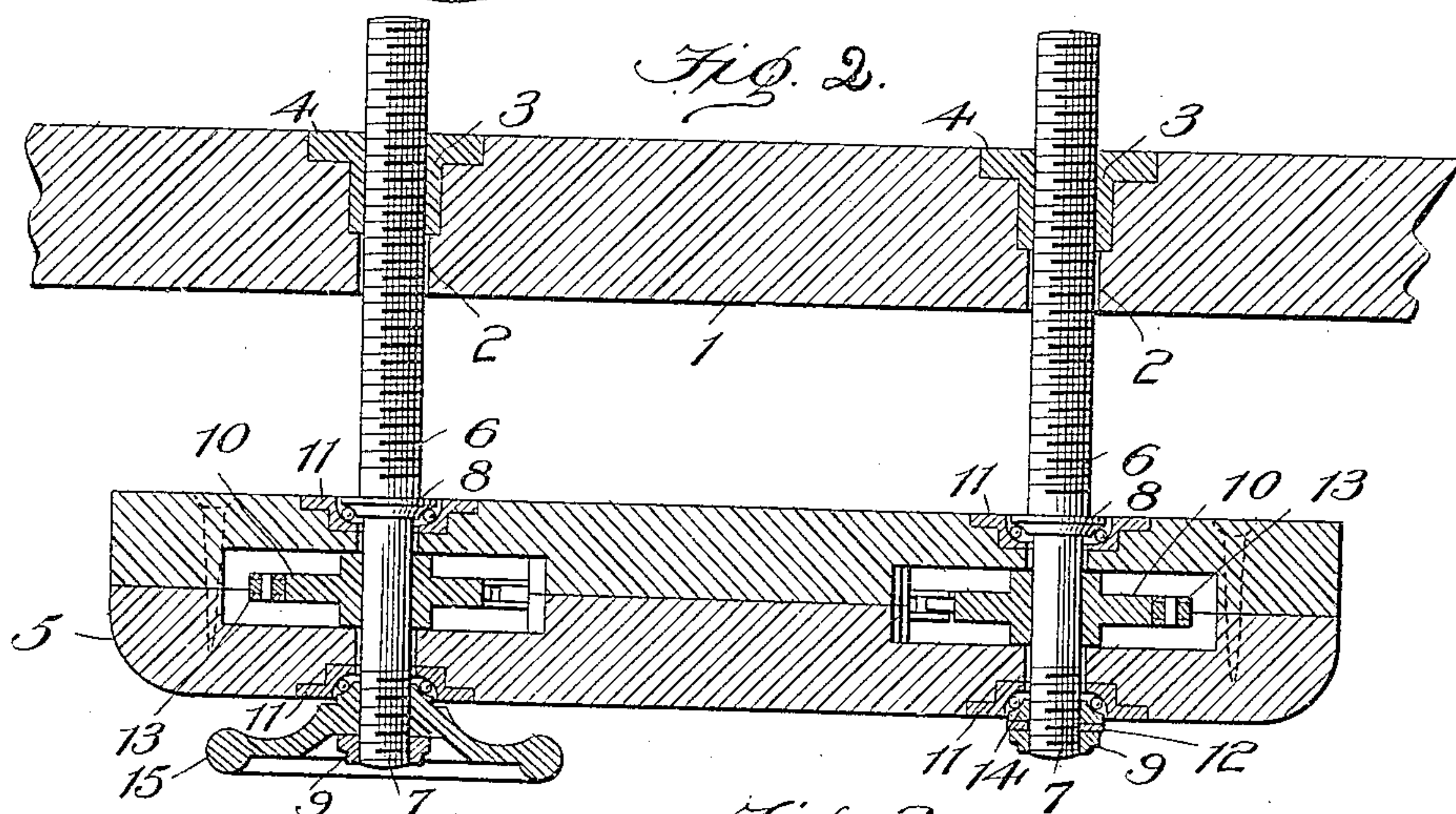


Fig. 3.

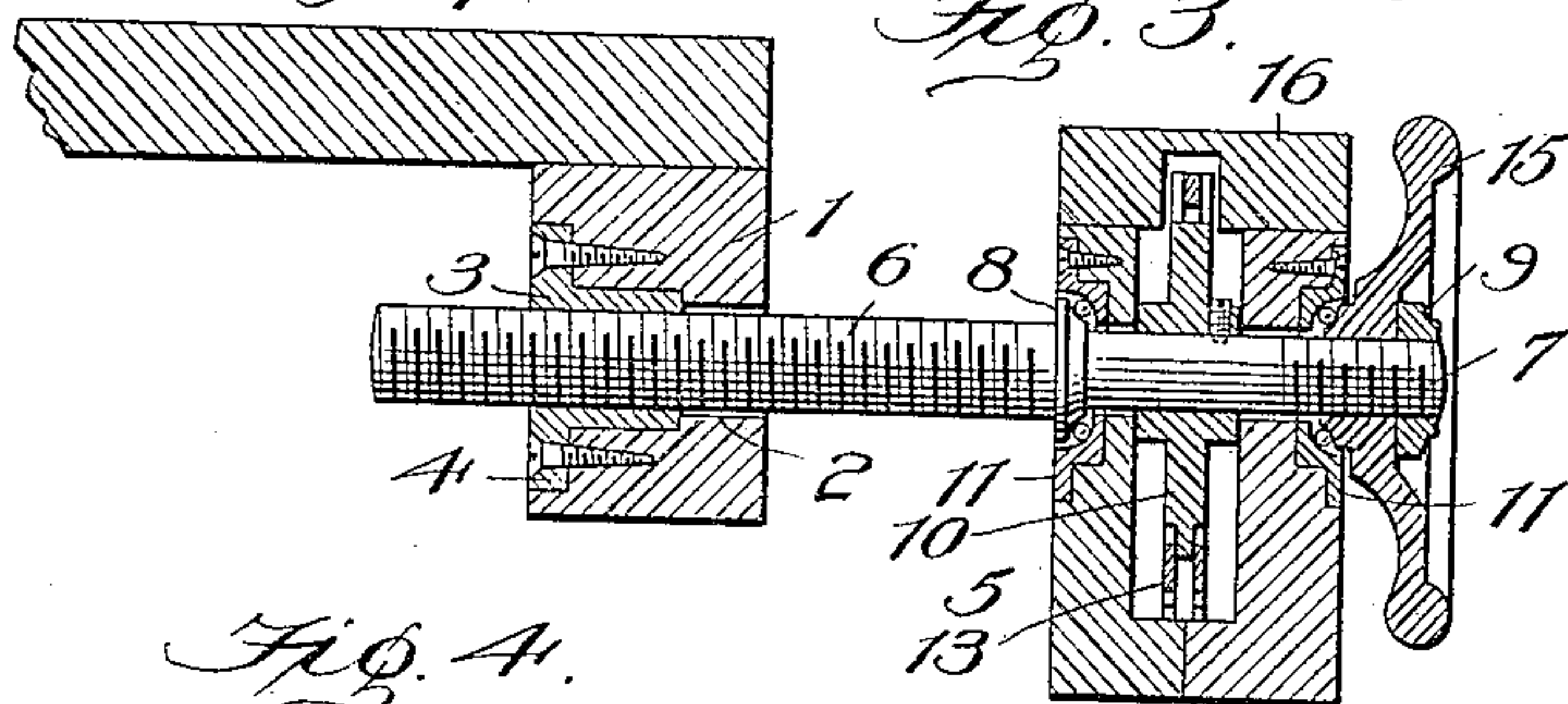
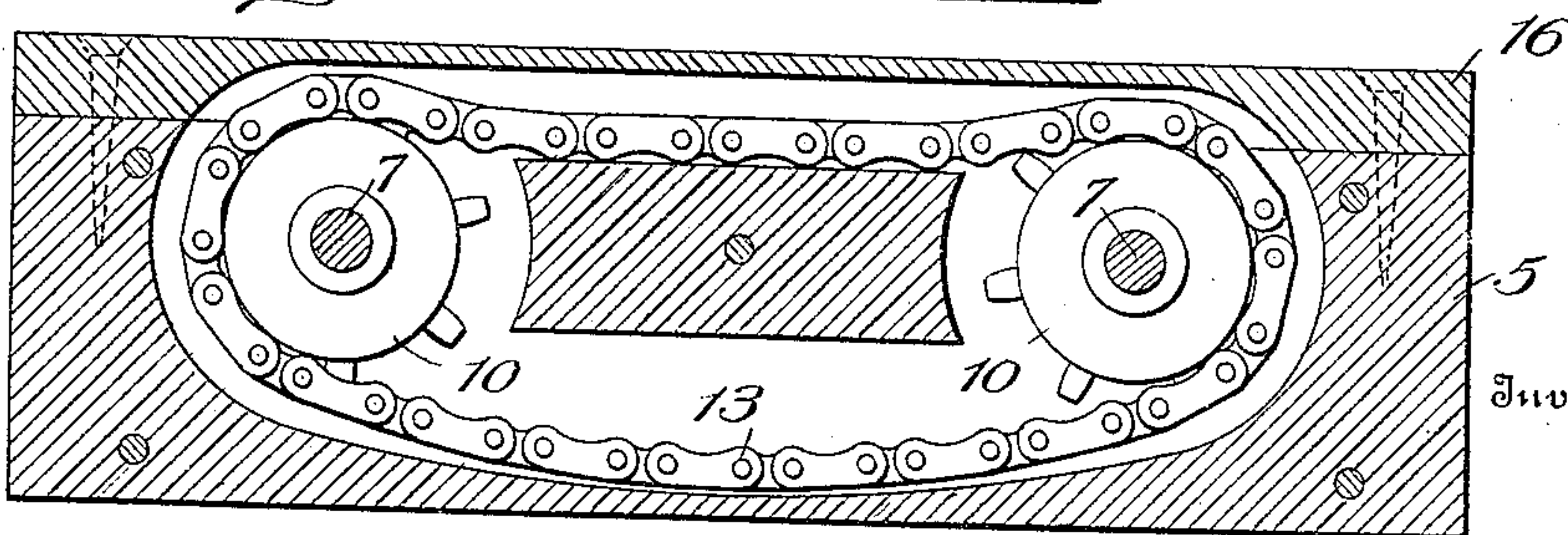


Fig. 4.



Witnesses

Edwin L. Bradford
Anne B. Johnson

By

William Henry Snow
Johnson & Johnson
Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM HENRY SNOW, OF BRATTLEBORO, VERMONT.

PARALLEL BENCH-VISE.

No. 816,508.

Specification of Letters Patent.

Patented March 27, 1906.

Application filed July 29, 1905. Serial No. 271,838.

To all whom it may concern:

Be it known that I, WILLIAM HENRY SNOW, a citizen of the United States, residing at Brattleboro, in the county of Windham and State of Vermont, have invented certain new and useful Improvements in Parallel Bench-Vises; 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.

In improving the bench-vise my object is to obtain a firm and easy parallel movement of the jaw, a free rotation of the mounting screw-stems for the jaw, to provide novel constructions for the mounting-bearings for the screw-stems, and for taking up the wear, and in the concluding claim I will point out the novel construction.

In the accompanying drawings, Figure 1 shows in perspective a portion of a bench having my improved parallel vise. Fig. 2 is a horizontal section through the jaw member and its pair of screw-stems, by which it is mounted for parallel movement on the bench. Fig. 3 is a vertical cross-section of the same through one of the screw-stems. Fig. 4 is a vertical longitudinal section of the jaw member, showing its inclosed screw-operating parts.

To the under side of the bench at its front edge is firmly fixed a block or sill 1, provided with a pair of openings 2 2 in the same horizontal plane, within each of which a tubular bearing 3, interiorly screw-threaded, is driven and secured to the said sill by a bolted flange 4, preferably on the inner side of said sill. The jaw member 5 of the vise is formed with an interior hollow which extends to near each end thereof and is open at its upper side. Transversely the walls of this jaw are pierced with openings corresponding with the openings in the bench-sill, and within these jaw-openings are mounted screw-stems 6 6, so that they project equally from the inner side of the jaw and engage the tubular screws in the bench-sill and form thereby the means of mounting the jaw member on the bench. That part 7 of each screw-stem which passes through the separated walls of the jaw member is of less diameter than the bench-engaging part and with which it forms a shoulder 8, standing in the plane of the inner wall of the jaw member. The end of this reduced part of each screw projects beyond the outer wall of the

jaw member and is screw-threaded to receive a clamp-nut 9, by which the screw-stems are fastened to the jaw.

Within the jaw-hollow and upon the reduced part of each screw is fixed a sprocket-wheel 10, a chain 13, connecting which, when one of the screw-stems are turned, will impart simultaneous turning of both screw-stems, and thereby cause the jaw to have a movement parallel to the bench. It is important that the mounting of these screw-stems in the jaw be durable and of a construction to give a free, quick, and easy movement to the jaw in clamping and unclamping the work, and for this purpose each wall of the jaw is provided with ball-bearings for the screw-stems. Concentric with each screw-stem the wall of the jaw on each side is formed with a recess within which is fitted and secured by screws a sunken or cup plate 11, with the sink or recess standing outward. A cone 14, screwed upon one of the screw-stems, forms, with the washer 12, a closure for confining the ball-bearings within the sink, so that the balls travel on the annular wall of each cup-plate, and the screw-stem is supported thereby on ball-bearings at the inner and at the outer sides of the jaw member, giving thereby each screw-stem two separate and distinct bearing-supports with a sprocket-wheel between them. The cones of the screw-stems are kept in engagement with the ball-bearings by a nut on the outer end of each screw-stem, while a hand-wheel 15 on one of the screw-stems is for operating the jaw member of the vise.

A cap 16 covers the interior hollow of the jaw member and is formed with a groove to receive the upper portions of the sprocket-wheels and the sprocket-chain, thereby preventing its displacement from the sprocket-wheels, which would be liable to occur in the quick turning of the hand-wheel. For convenience in mounting the sprocket-chain within the hollow of the jaw the latter may be made in two longitudinal half parts secured together, and when the screw-stems and their operating parts are assembled within the jaw and its cap secured thereon the jaw, with its screw-stems, is complete in itself and ready to be applied to the bench.

It is important to note that the shoulder on each screw-stem bears against and confines the ball-bearing cone upon the balls at the inner side of the jaw, while the nut and the hand-wheel on the outer side of the jaw

confines the ball-bearing cones on that side of the jaw member and clamps the shoulder of each screw upon the ball-bearing cones on the inner side of the jaw member. In this
 5 function of the hand-wheel it will be noticed that its hub is of conical form and takes the place of the separate cone 14 for confining the ball-bearings, the clamp-nut 9 serving to
 10 lock the hand-wheel to maintain its bearing against the balls and from unscrewing in operating the jaw member. This construction provides for the endwise adjustment of the screw-stems for taking up the wear of the ball-bearings and their seats, and in such ad-
 15 justments the cone and the nut-lock of one screw-stem are the means, while the conical hand-wheel and the nut-lock of the other screw-stem are the means, so that the screw-stems are kept in firm working in the jaw, be-
 20 cause in screwing in the cone 14 and the conical hand-wheel upon their respective ball-bearings will cause the conical shoulders 8 of the screw-stems to be drawn against their respective ball-bearings at the inner
 25 side of the jaw.

It will be noted that the bearings for the mounting screw-stems, consisting of the cup-plates, conical shoulders, screw-clamping cones, and ball-bearings, are inclosed within
 30 the walls of the jaw, making close joints at the walls, rendering the screw-stems easy to rotate and the bearings firm and durable, and this is the important matter for preventing cramping of the screws in the jaw and in the
 35 bench-nuts. Making the hand-wheel of conical form renders it a clamping and bearing element for the screw-stem and its ball-bearings, and this, so far as I know and can find, is a new and advantageous construction,
 40 rendering the hand-wheel an adjusting element in keeping the working of the jaw firm.

I claim—

1. In a parallel vise, the clamping-jaw, a

pair of mounting screw-stems therefor, a mounting-bearing for each screw-stem con- 45
 sisting of a recessed or cup plate on the inner and on the outer sides of the jaw, a conical shoulder on each screw-stem within the recess of each cup-plate at the inner side of the jaw, a screw-cone within the recess of the 50
 cup-plate on the outer end of one of the screw-stems, a nut-lock for said cone, the hand-wheel screwed upon the other screw-stem formed with a clamping bearing-cone projecting within the cup-plate of the other 55
 screw-stem, a clamp-nut for the conical hand-wheel, ball-bearings within the said cups, a sprocket-wheel on each screw-stem within the jaw and a chain connecting the wheels the said elements comprising the 60
 clamping-jaw.

2. In a vise, the combination with the clamping-jaw, and a pair of mounting screw-stems therefor each having a shoulder, of mounting-bearings for the stems consisting 65
 of a conical shoulder abutting the shoulder on each screw-stem at the inner side of the jaw, ball-bearings at said shoulders, ball-bearings for said screw-stems at the outer side of the jaw, a cone and a lock-nut both 70
 screwed on the outer end of one screw-stem, a hand-wheel screwed upon the outer end of the other screw-stem and formed with a bearing-cone whereby screwing in said hand-wheel causes its cone to be clamped upon the 75
 ball-bearings and the said conical shoulder to be clamped upon its ball-bearings, and a lock-nut for the wheel.

In testimony whereof I have signed my name to this specification in the presence of 80
 two subscribing witnesses.

WILLIAM HENRY SNOW

Witnesses:

HARRY C. FREEMAN,
 EDWARD L. COOK.