W. D. C. WRIGHT.

ADJUSTABLE VISE.

APPLICATION FILED NOV. 23, 1914.

1,155,027.

Patented Sept. 28, 1915.

2 SHEETS—SHEET 1.

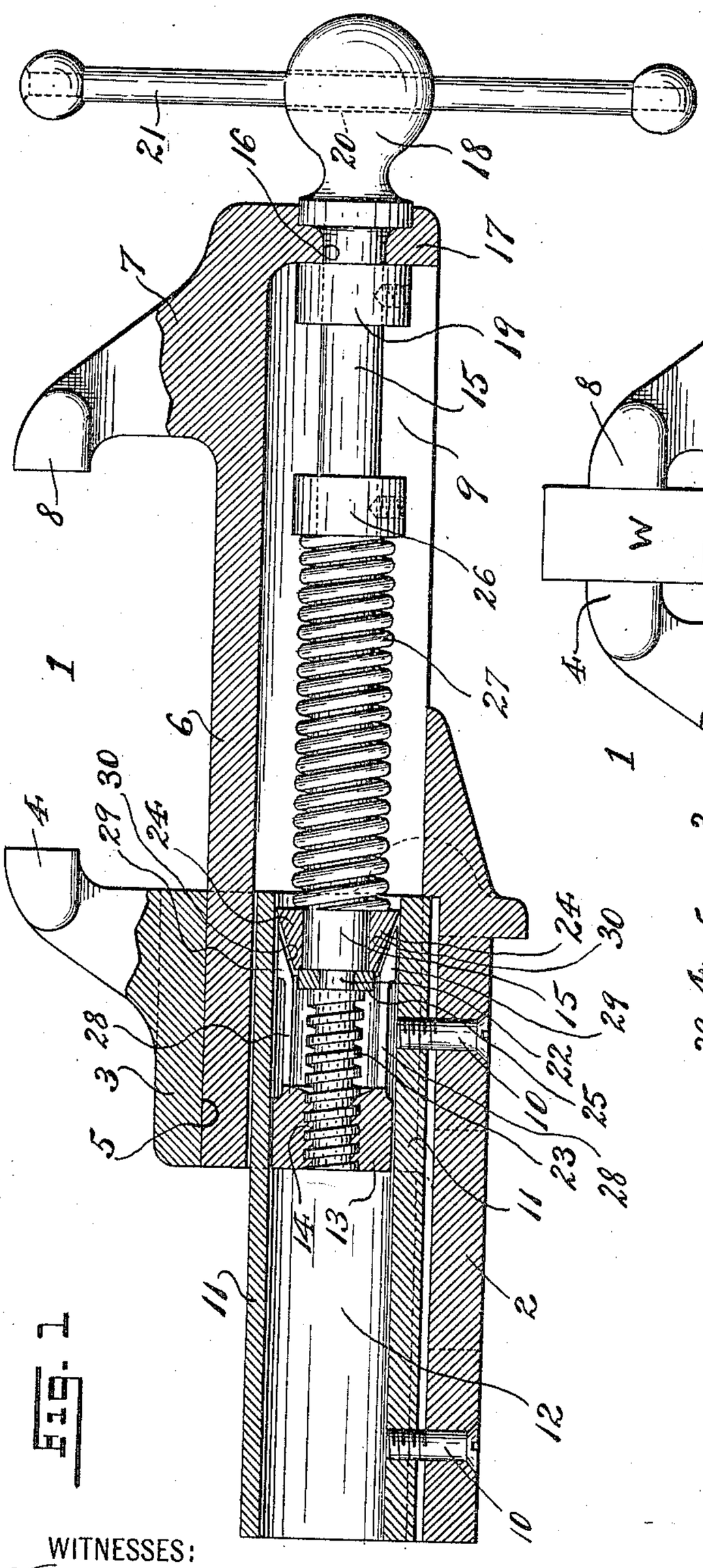

Fig. 1.

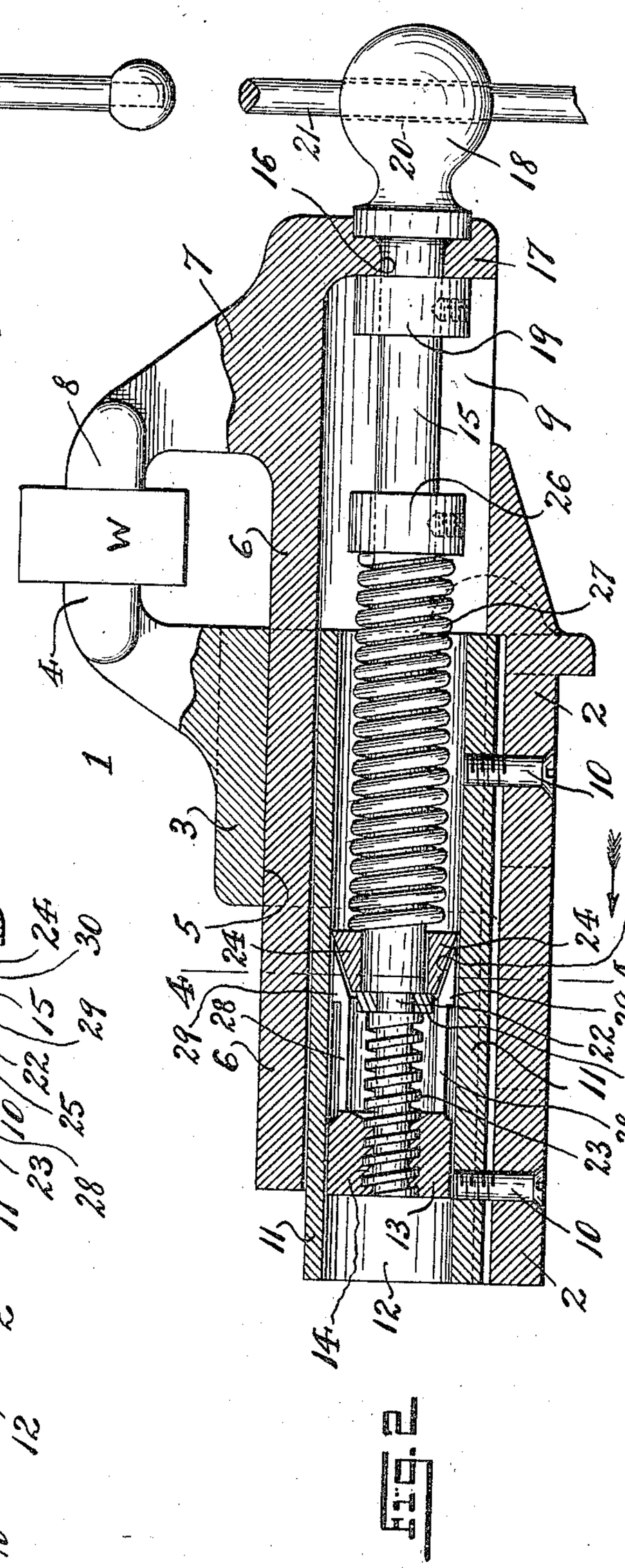

Fig. 2.

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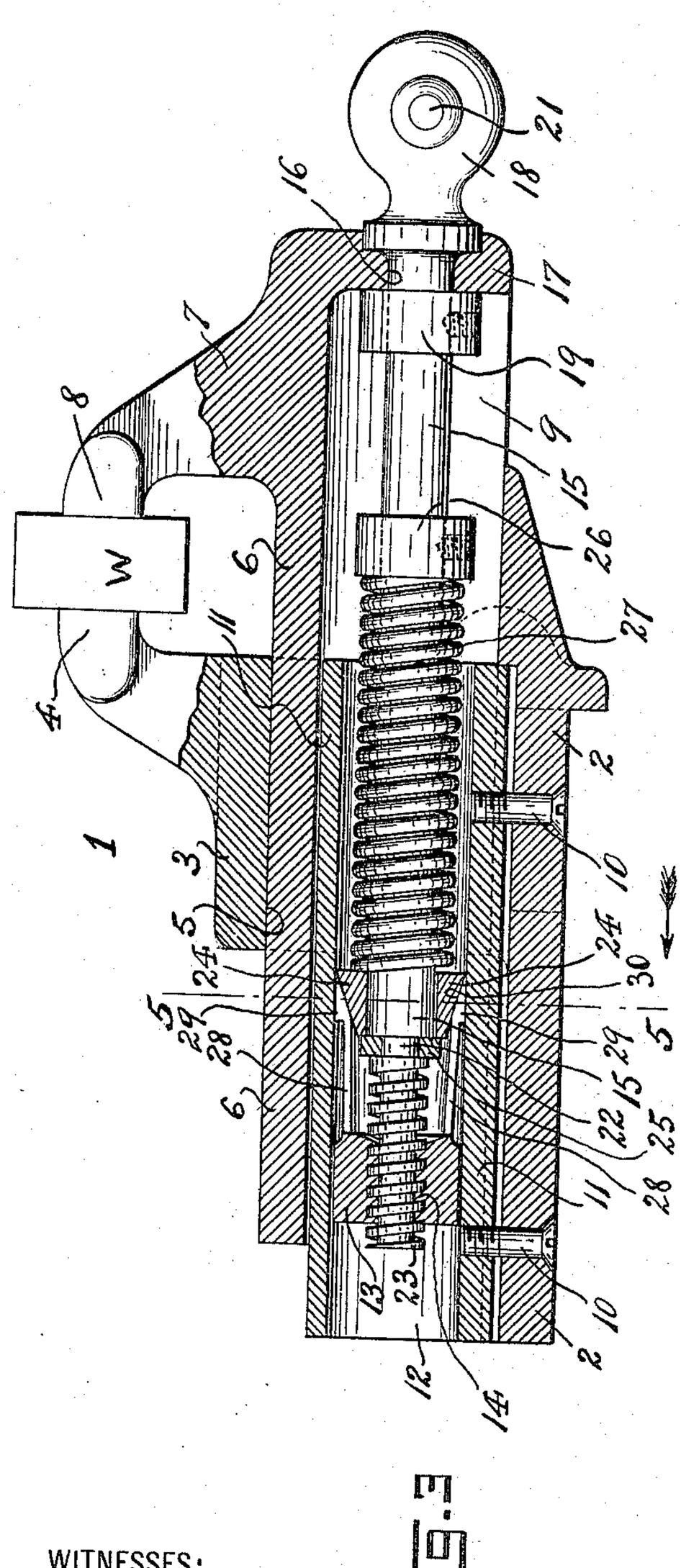

Fig. 3.

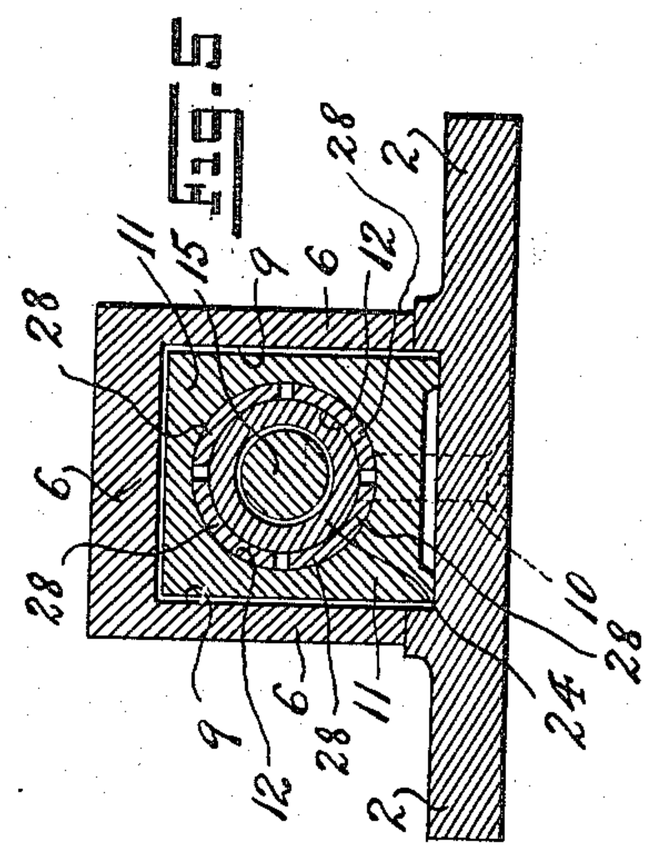

Fig. 5.

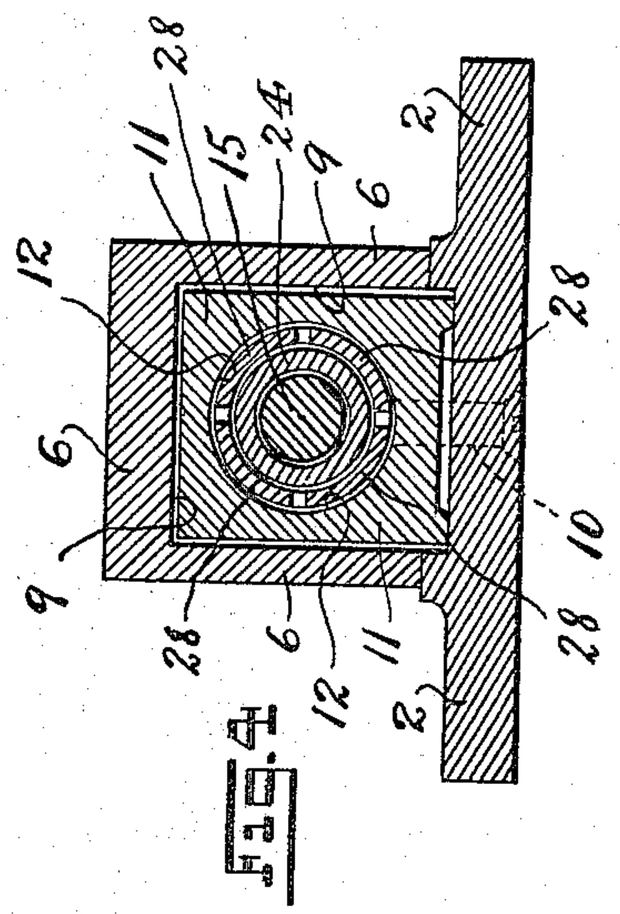

Fig. 4.

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UNITED STATES PATENT OFFICE.

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ADJUSTABLE VISE.

1,155,027. Specification of Letters Patent. Patented Sept. 28, 1915.

Application filed November 23, 1914. Serial No. 873,468.

To all whom it may concern:

Be it known that I, WILSON D. CRAIG WRIGHT, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Adjustable 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, reference being had to the accompanying drawings, and to characters of reference marked thereon, which form a part of this specification.

The present invention has reference, generally, to improvements in bench-vises and similar devices, and the invention relates more particularly, to a novel construction of adjustable vise which can be easily and quickly adjusted or set up to the work prior to the final clamping operation.

The invention has for its principal object to provide a simple and efficient construction of quickly adjustable bench-vise and the like, in which a free sliding movement or adjustment of the movable clamp-jaw may be obtained without necessity of operating through the ordinary screw adjustment common to vises of the old style, such adjustment being preliminary to the final clamping action of the mechanism, which latter action is obtained by means of a screw adjustment, novel means for locking the nut of such screw adjusting devices automatically when the screw is turned to obtain the clamping action.

Other objects of the present invention, not at this time more particularly enumerated, will be clearly understood from the following detailed description of the present invention.

With the various objects of the present invention in view, the same consists, primarily, in the novel construction of quickly adjustable bench vise, hereinafter set forth; and, the invention consists, furthermore, in the several novel arrangements and combinations of the various parts thereof, as well as in the details of the construction thereof, all of which will be fully described in the following specification, and then finally embodied in the claims which are appended to and which form an essential part of this specification.

The invention is clearly illustrated in the accompanying drawings, in which:—

Figure 1 is a vertical longitudinal section of the novel construction of quickly adjustable bench vise, made according to and embodying the principles of the present invention, the same being shown with its jaws open. Fig. 2 is a similar section showing the jaws adjusted to the work to be held therein prior to the final clamping or locking of the jaws in binding or gripping relation to said work. Fig. 3 is another similar section showing the vise and its members in operative relations, with the jaws locked in clamping or binding relation to the work held therein. Fig. 4 is a cross section taken on line 4—4 in said Fig. 2; and Fig. 5 is a similar cross section taken on line 5—5 in said Fig. 3.

Similar characters of reference are employed in all of the hereinabove described views to indicate corresponding parts.

Referring now to the said drawings, the reference character 1 indicates the complete quickly adjustable bench vise made according to the principles of my present invention, the same comprising a base-plate 2 with which is connected the stationary clamp-member 3 having the jaw 4. Said stationary clamp-member 3 is provided with an opening 5 in which is slidably arranged the movable stock-portion 6 which carries at its free or outer end the movable clamp-member 7 having the jaw 8. Said stock-portion 6 is channeled out on its under side to provide a longitudinally extending open space 9. Fixed upon said base-plate 2, by means of screws 10, or any other desirable form of fastening means, is a longitudinally extending barrel or guide-block 11, the same having a longitudinal cylindrical opening 12 extending therethrough. Slidably arranged to move back or forth through said cylindrical opening 12 is a nut-piece 13, the same being provided with internal screw-threads 14.

The reference character 15 indicates a rotatable shaft or stem, the outer end of which is mounted in an opening 16 provided in the end wall 17 of said stock-portion 6, said opening 16 providing a bearing for said shaft or stem 15. Said shaft or stem 15 is provided at its outer extremity with an enlarged head 18 which engages said end wall 17, and prevents longitudinal movement of

said shaft or stem relative to said stock-portion and at the same time transmits the longitudinal movement of the former to the latter. A collar 19 fixed on said shaft or stem and against the opposite side of said end wall 17 serves a similar purpose. Said head 18 is provided with a transverse perforation or opening 20 in which is arranged the usual form of lever-members 21 by means of which said shaft or stem is rotated when desired. Situated at the inner free end of said shaft or stem 15 is a reduced extension 22 provided with external screw-threads 23 which screw into said nut-piece 13 in engagement with said internal screw-threads 14. Mounted loosely on said shaft or stem 15, to the rear of said screw threaded portion, is a cone-member or wedge-piece 24, the forward movement of which is stopped or limited by a collar 25 fixed upon said reduced extension 22. Secured in a proper position upon said shaft or stem 15 is a stop-collar 26 which forms a stop or back against which is based a coil-spring 27 which extends or coils around said shaft or stem and serves to provide a yieldable backing for said cone-member or wedge-piece 24. Formed integrally with and extending rearwardly from said nut-piece 13 are a plurality of expansible arms 28, provided at their outer ends with gripping portions 29 on the under sides of which are tapered portions or surfaces 30 corresponding to and adapted to be engaged operatively by said cone-member or wedge-piece 24.

Having described the construction of the novel quickly adjustable bench-vise, its operation is as follows:—Normally the screw-threaded portion of said shaft or stem 15 is turned back in said nut-piece so that said cone-member or wedge-piece 24 is removed from engagement with said expansible-arms 28, which consequently are normally positioned out of engagement with the walls of said cylindrical opening 12 of said barrel or guide-block 11, and therefore said nut-piece 13 is free to slide in said cylindrical opening 12. The work W is then laid against the jaws 4 of the stationary clamp-member 3, and then the movable clamp-member 7 and its stock-portion 6 is moved forward until the jaw 8 contacts with the work W, and during this forward movement the shaft or stem 15 is also moved forward carrying with it the nut-piece 13. The parts have thus been quickly positioned to adjust the clamp-members' jaws to the work W, the binding or locking of said jaws in gripping relation to the work W may be effected as follows:—The stem or shaft 15 is rotated to turn said screw-threaded portion thereof in the nut-piece 13, with the effect of drawing said nut-piece rearward and carrying its expansible-arms 28 in engagement with said cone-member or wedge-piece 24. Engagement of the former with the latter tends to press outwardly or expand said expansible arms 28, and thereby carries the gripping-portions 29 of the latter in binding engagement with the walls of said cylindrical opening 12 thus locking said nut-piece against further movement. Now if a still tighter grip of the jaws 3 and 8 upon the work W is desired, the shaft or stem 15 may be rotated to move the same forward, since the nut-piece 13 remains stationary, the forward movement of the stem or shaft moves forward the stock-portion 6 and the movable clamp-member 7 whereby the jaw 8 is forced into tighter gripping relation to the work. This additional movement of the stem or shaft and parts connected therewith, independent of the nut-piece 13 is possible because the cone-member or wedge-piece 24 is loose on said shaft thus permitting the latter to move through the same, and the backing-spring 27 is further compressed by this additional forward movement of the stem or shaft, and its pressure upon the cone-member or wedge-piece 24 is sufficient to maintain the latter in proper expanding relation to said expansible arms 28 of said nut-piece 13. It will thus be seen that not only are the jaws 3 and 8 locked in gripping relation to the work, but also a variable degree of gripping pressure of the same upon the work may be easily and quickly obtained by an additional turn or so of the stem or shaft 15 after the nut-piece is locked to hold the stem or shaft 15 and the parts connected therewith against release. To release the grip of the jaws 3 and 8, the operations above described are reversed, as will be clearly understood.

I am aware that some changes may be made in the various arrangements and combinations of the various devices and parts, as well as in the details of the construction thereof, without departing from the scope of my present invention. Hence, I do not limit my invention to the exact arrangements and combinations of the said parts as described in the foregoing specification, nor do I confine myself to the exact details of the construction of the details of the same as shown in the accompanying drawings.

I claim:—

1. An adjustable vise comprising a stationary clamp-member and a movable clamp-member slidably related thereto, said movable clamp-member having a rotatable shaft connected therewith, an externally screw-threaded portion at the inner free end of said shaft, a guide block having a longitudinal cylindrical opening into which said shaft extends, a nut-piece slidably arranged in said cylindrical opening, said screw-threaded portion of said shaft entering said nut-piece, expansible arms extending rearwardly from said nut-piece, and means carried by

said shaft for expanding said expansible arms to move the same into binding relation to the walls of said cylindrical opening to lock said nut-piece in fixed relation to said guide-block, said means being brought into operation by turning said shaft.

2. An adjustable vise comprising a stationary clamp-member and a movable clamp-member slidably related thereto, said movable clamp-member having a rotatable shaft connected therewith, an externally screw-threaded portion at the inner free end of said shaft, a guide block having a longitudinal cylindrical opening into which said shaft extends, a nut-piece slidably arranged in said cylindrical opening, said screw-threaded portion of said shaft entering said nut-piece, expansible arms extending rearwardly from said nut-piece, and means carried by said shaft for expanding said expansible arms to move the same into binding relation to the walls of said cylindrical opening to lock said nut-piece in fixed relation to said guide-block, said means comprising a wedge-piece mounted on said shaft, said wedge-piece being brought into operation by turning said shaft.

3. An adjustable vise comprising a stationary clamp-member and a movable clamp-member slidably related thereto, said movable clamp-member having a rotatable shaft connected therewith, an externally screw-threaded portion at the inner free end of said shaft, a guide block having a longitudinal cylindrical opening into which said shaft extends, a nut-piece slidably arranged in said cylindrical opening, said screw-threaded portion of said shaft entering said nut-piece, expansible arms extending rearwardly from said nut-piece, and means carried by said shaft for expanding said expansible arms to move the same into binding relation to the walls of said cylindrical opening to lock said nut-piece in fixed relation to said guide-block, said means comprising a wedge-piece loosely mounted on said shaft, and a coil-spring adapted to yieldably back said wedge-piece, said wedge-piece being brought into operation by turning said shaft.

4. An adjustable vise comprising a stationary clamp-member, a movable clamp-member having a stock-portion slidably related to said stationary clamp-member, a guide-block having a longitudinal cylindrical opening arranged in fixed relation to said stationary clamp-member, said stock-portion of said movable clamp-member having an open channel in its under side adapted to straddle said guide-block, a shaft rotatably connected with said movable clamp-member and its stock-portion, an externally screw-threaded portion at the inner free end of said shaft, a nut-piece having internal screw-threads slidably arranged in said cylindrical opening, said screw-threaded portion of said shaft engaging the threads of said nut-piece, expansible arms extending rearwardly from said nut-piece, and means carried by said shaft for expanding said expansible arms to move the same into binding relation to the walls of said cylindrical opening to lock said nut-piece in fixed relation to said guide-block, said means being brought into operation by turning said shaft.

5. An adjustable vise comprising a stationary clamp-member, a movable clamp-member having a stock-portion slidably related to said stationary clamp-member, a guide-block having a longitudinal cylindrical opening arranged in fixed relation to said stationary clamp-member, said stock-portion of said movable clamp-member having an open channel in its under side adapted to straddle said guide-block, a shaft rotatably connected with said movable clamp-member and its stock-portion, an externally screw-threaded portion at the inner free end of said shaft, a nut-piece having internal screw-threads slidably arranged in said cylindrical opening, said screw-threaded portion of said shaft engaging the threads of said nut-piece, expansible arms extending rearwardly from said nut-piece, and means carried by said shaft for expanding said expansible arms to move the same into binding relation to the walls of said cylindrical opening to lock said nut-piece in fixed relation to said guide-block, said means comprising a wedge-piece mounted on said shaft, said wedge-piece being brought into operation by turning said shaft.

6. An adjustable vise comprising a stationary clamp-member, a movable clamp-member having a stock-portion slidably related to said stationary clamp-member, a guide-block having a longitudinal cylindrical opening arranged in fixed relation to said stationary clamp-member, said stock-portion of said movable clamp-member having an open channel in its under side adapted to straddle said guide-block, a shaft rotatably connected with said movable clamp-member and its stock-portion, an externally screw-threaded portion at the inner free end of said shaft, a nut-piece having internal screw-threads slidably arranged in said cylindrical opening, said screw-threaded portion of said shaft engaging the threads of said nut-piece, expansible arms extending rearwardly from said nut-piece, and means carried by said shaft for expanding said expansible arms to move the same into binding relation to the walls of said cylindrical opening to lock said nut-piece in fixed relation to said guide-block, said means comprising a wedge-piece loosely mounted on said shaft, and a coil-spring adapted to yieldably back said wedge-piece, said wedge-piece being brought into operation by turning said shaft.

7. An adjustable vise comprising a stationary clamp-member and a movable clamp-member associated therewith, a slidable nut-piece related to said stationary clamp-member, a rotatable shaft related to said movable clamp-member, said shaft being in threaded engagement with said nut-piece, expansible arms connected with nut-piece, and means carried by said shaft for expanding said expansible arms to frictionally bind said nut-piece in non-moving relation to said stationary clamp-member, said means being brought into operation by turning said shaft.

8. An adjustable vise comprising a stationary clamp-member and a movable clamp-member associated therewith, a slidable nut-piece related to said stationary clamp-member, a rotatable shaft related to said movable clamp-member, said shaft being in threaded engagement with said nut-piece, expansible arms connected with said nut-piece, and means carried by said shaft for expanding said expansible arms to frictionally bind said nut-piece in non-moving relation to said stationary clamp-member, said means comprising a wedge-piece mounted on said shaft, said wedge-piece being brought into operation by turning said shaft.

9. An adjustable vise comprising a stationary clamp-member and a movable clamp-member associated therewith, a slidable nut-piece related to said stationary clamp-member, a rotatable shaft related to said movable clamp-member, said shaft being in threaded engagement with said nut-piece, expansible arms connected with said nut-piece, and means carried by said shaft for expanding said expansible arms to frictionally bind said nut-piece in non-moving relation to said stationary clamp-member, said means comprising a wedge-piece loosely mounted on said shaft, and a coil-spring adapted to yieldably back said wedge-piece, said wedge-piece being brought into operation by turning said shaft.

In testimony that I claim the invention set forth above I have hereunto set my hand.

WILSON D. CRAIG WRIGHT.

Witnesses:
LORENZO J. RILEY,
HENRY A. TUMELTY.