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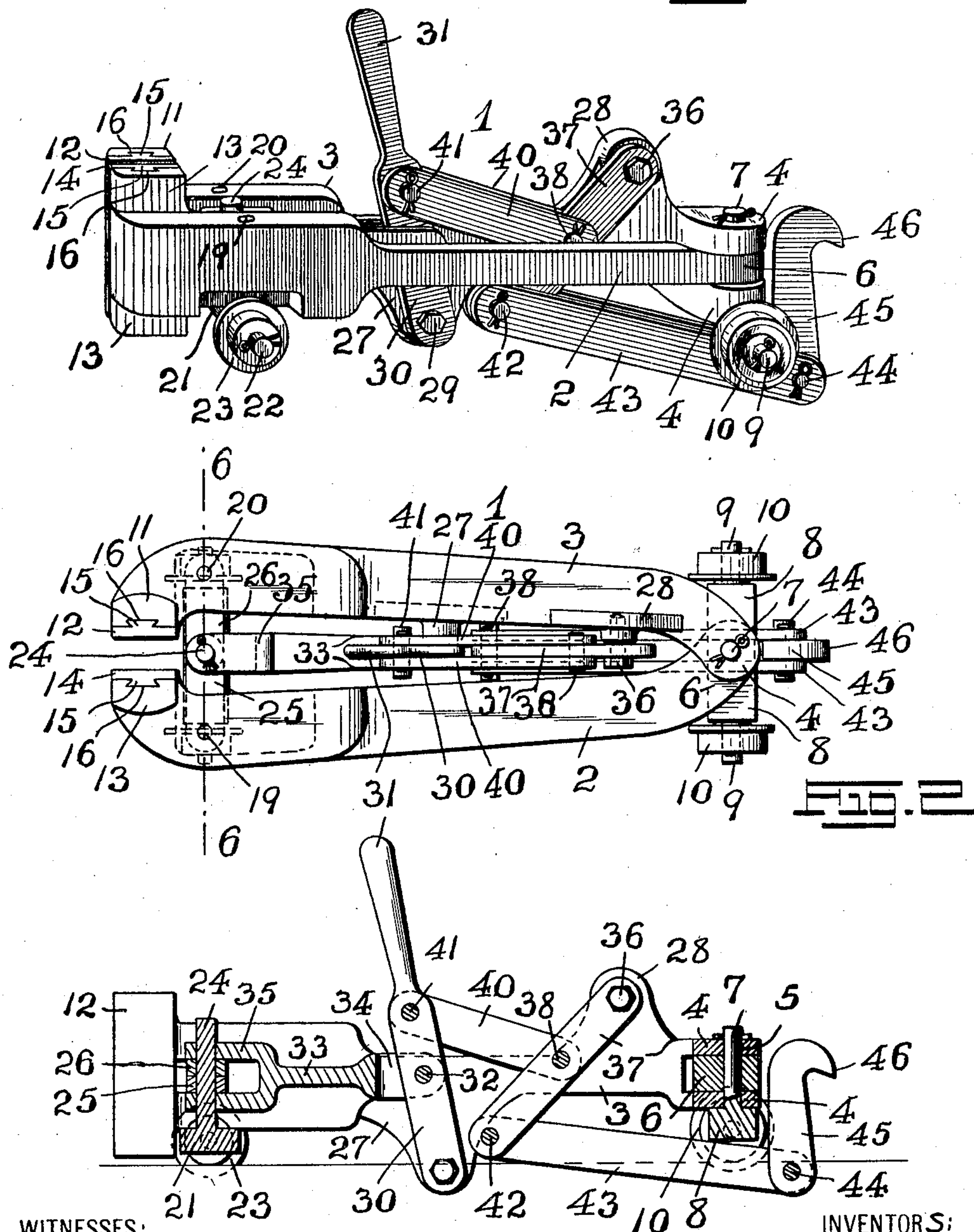
A. A. BERGHOF & F. W. THEBERATH.  
DRAW CLAMP FOR DRAW BENCHES.

APPLICATION FILED DEC. 14, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

FIG. 1



WITNESSES:

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H. B. Fraentzel

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August H. Berghof &  
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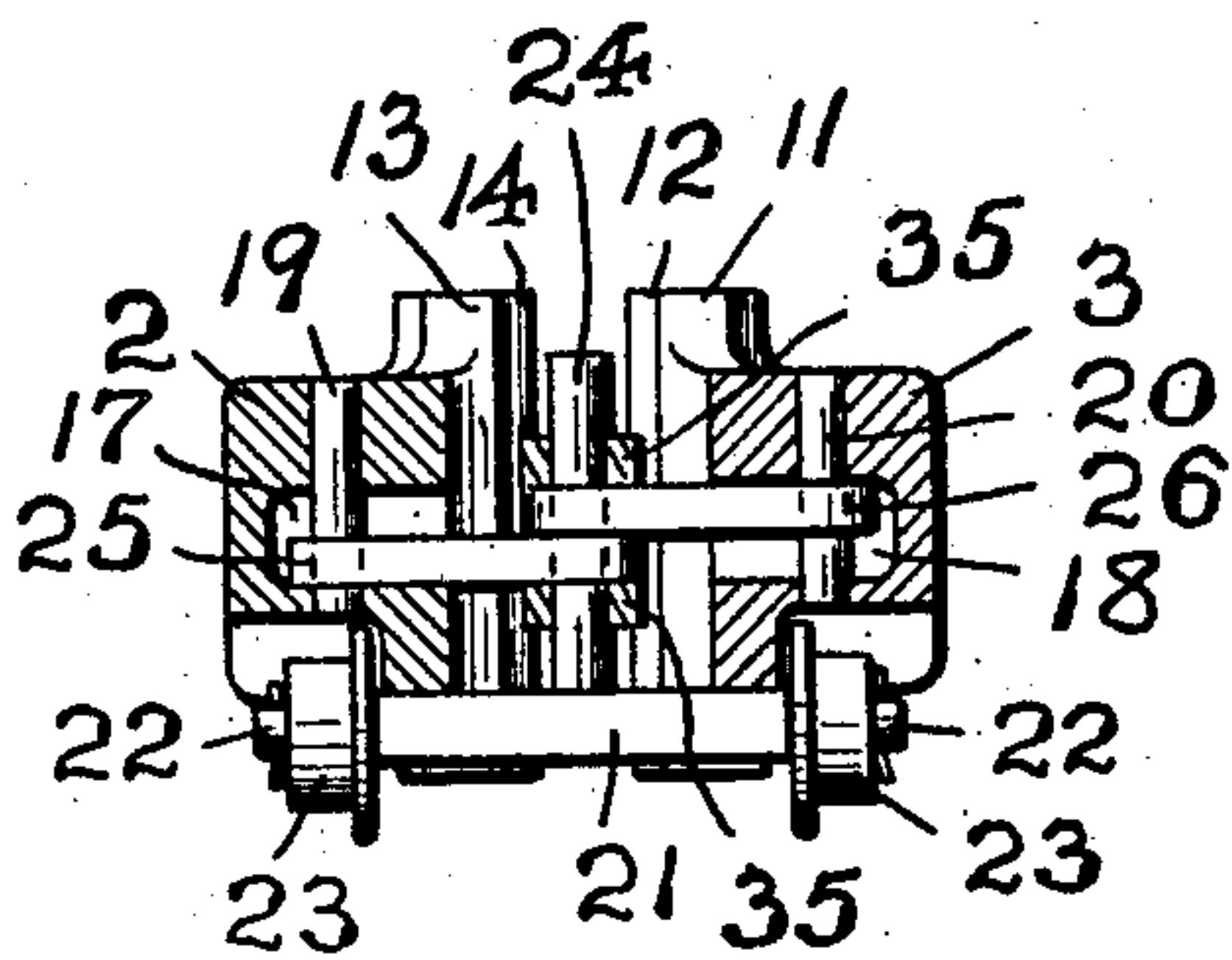
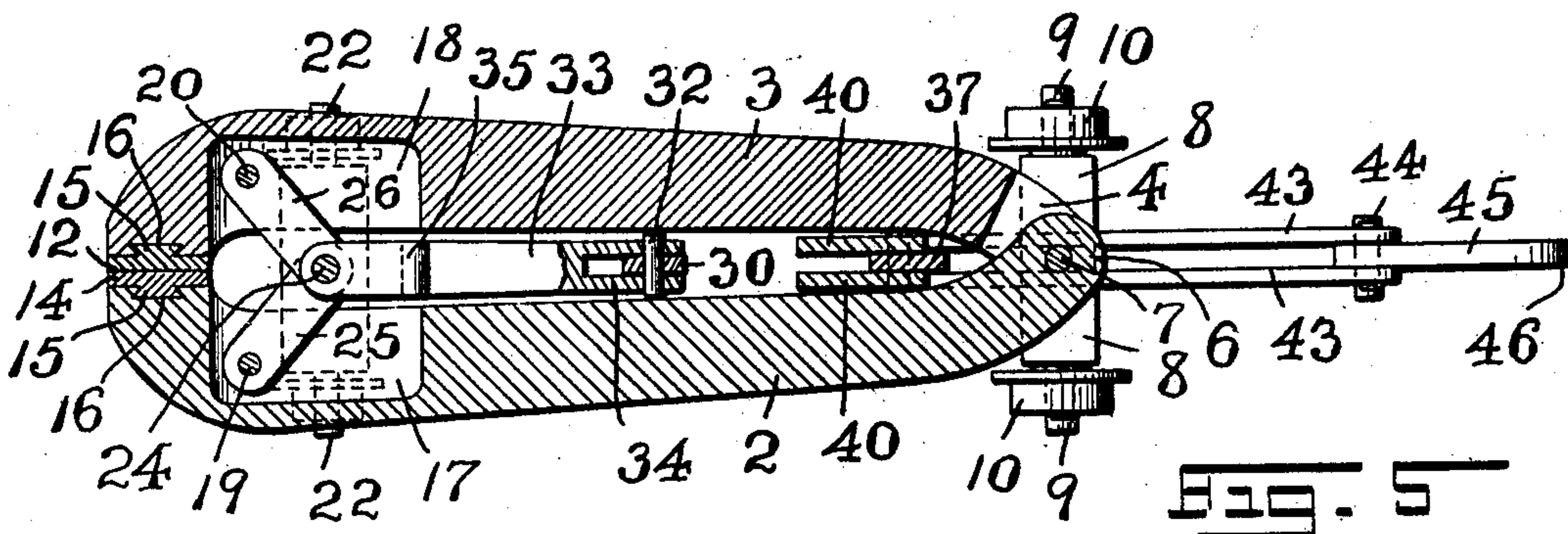
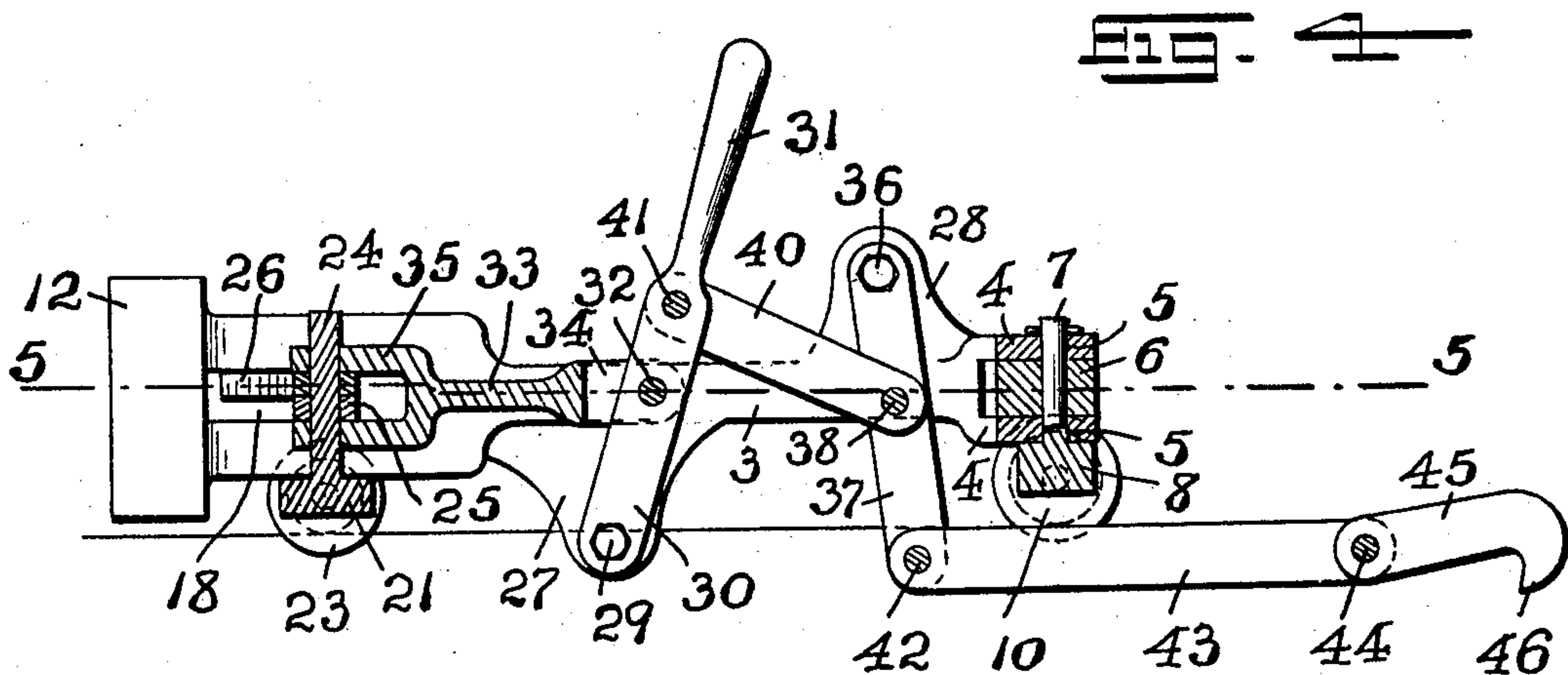
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# UNITED STATES PATENT OFFICE.

AUGUST A. BERGHOF AND FREDERICK W. THEBERATH, OF NEWARK,  
NEW JERSEY, ASSIGNORS TO GEORGE A. OHL & CO., A CORPORA-  
TION OF NEW JERSEY.

## DRAW-CLAMP FOR DRAW-BENCHES.

SPECIFICATION forming part of Letters Patent No. 763,711, dated June 28, 1904.

Application filed December 14, 1903. Serial No. 185,004. (No model.)

*To all whom it may concern:*

Be it known that we, AUGUST A. BERGHOF and FREDERICK W. THEBERATH, citizens of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Draw-Clamps for Draw-Benches; and we 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 numerals of reference marked thereon, which form a part of this specification.

Our present invention has reference to a novel draw-clamp or vise for use with draw-benches for the purposes of drawing wire or for the drawing of sheet metal or other material over moldings or into the forms of tubes to suit the various gages and shapes of the material desired to be drawn; and this invention is in the nature of improvements in that class of draw-clamps or vises set forth in another application for Letters Patent filed by us on November 23, 1903, Serial No. 182,212.

Our present invention has for its principal object to provide a simply-constructed draw-clamp or vise comprising a pair of pivoted jaw or main body members and a system of compound levers located between the holding-jaws and the point of pivotal connection of the said jaw members to be used with any ordinary and usual construction of draw-bench and with a view of arranging the said system of levers in such a manner that the grip or bite of the clamping or holding jaws upon the material which is to be drawn will be positive and the harder the pull the tighter will be the clamping action of the jaws, thereby positively preventing the slip or displacement of the end portion of the material during the drawing-operation from between the holding or clamping jaws of the clamp or vise no matter in which position the clamp or vise is being used, whether horizontally, vertically, or otherwise.

Other objects of the present invention not at this time more particularly enumerated will

be made clear from the following detailed description of the present invention.

This invention consists, therefore, in the novel construction of draw-clamp or vise hereinafter set forth; and, furthermore, the invention consists in the various arrangements and combinations of devices and their parts, 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 clauses of the claim.

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

Figure 1 is a perspective of a draw-clamp or vise for a draw-bench embodying the principles of the present invention, and Fig. 2 is a top or plan view of the same. Fig. 3 is a longitudinal vertical section of the device, taken centrally through said Fig. 2, but the system of levers being represented in elevation and showing them in their relative positions when the holding-jaws are in their normal initial and separated positions; and Fig. 4 is a similar sectional representation of the same parts when the clamping members and their jaws are in the operated or clamping relation. Fig. 5 is a horizontal section taken on line 5 5 in said Fig. 4, certain parts being represented in plan; and Fig. 6 is a transverse vertical section taken on line 6 6 in said Fig. 2 of the drawings.

Similar characters of reference are employed in the above-described views to indicate corresponding parts.

In the said drawings the reference character 1 indicates the complete draw-clamp or vise embodying the principles of our present invention and which is preferably made in the form of a carriage to be movably arranged upon the bed of framework of a draw-bench.

The draw-clamp or vise comprises a pair of body or jaw members 2 and 3, one of said members, as 3, having a forked end portion 4, having an opening or perforation 5, and the other member, 2, having a perforated end portion 6 to be arranged between the two members of said forked portion 4 and then pivotally united by means of a pin or stud 7. This pin or stud 7 is connected with a cross-



bar or axle 8, having journals 9 at its opposite ends, upon which are rotatively arranged the wheels or rollers 10. At its forward end the member 2 is made with a preferably vertically-extending holding portion 11, to which is connected in any suitable manner a jaw or holding-plate 12, of hardened and tempered steel. In a like manner the forward end of the member 3 is made with a preferably vertically-extending holding portion 13, with which is connected in any suitable manner a jaw or holding-plate 14, also of hardened and tempered steel. Of course it will be understood that these holding portions 11 and 13 and the jaw-plates connected therewith need not necessarily be arranged in vertical positions; but they may be otherwise disposed, if desired. The said holding or jaw plates 12 and 14 are preferably detachably connected with the respective jaw members, so as to be replaced when worn down, by means of an arrangement of dovetail projections 15 and correspondingly-shaped recesses 16, as illustrated in Figs. 2 and 5; but of course it will be evident that any other suitable fastening means may be employed, if desired.

Referring now more particularly to Figs. 3 to 6, inclusive, it will be seen that the respective body members 2 and 3 are provided near their forward ends, directly back of the jaw or holding members 11 and 13, with suitably-arranged recessed or chambered portions 17 and 18, a pivotal pin or post 19 extending across the recess or chamber 17 and a second pivotal pin or post 20 extending across the chamber 18. Movably arranged beneath the recessed or chambered parts of the two main body members 2 and 3 is a cross-bar or axle 21, having at its ends journals 22, upon which are rotatably arranged suitable rollers or wheels 23, these several parts being arranged and operating substantially as will be evident from an inspection of Figs. 1 and 6. Connected with the said cross-bar or axle 21 is a pin or stud 24, which extends in an upward direction between the said two body members 2 and 3, as shown, an oscillating link 25 being pivotally connected at its respective ends with the said pin or stud 24 and with the pin or post 19 and another oscillating link 26 being pivotally connected at its respective ends with the said pin or stud 24 and with the pin or post 20. Thus it will be clearly seen that while the jaw portions of the members 2 and 3 are pivotally connected by means of a suitable toggle connection this end portion of the draw-clamp or vise is also supported by means of the axle or cross-bar 21, provided with the wheels or rollers 23, whereby when the draw-clamp or vise is placed upon the draw-bench it can be moved back and forth upon the frame of the bench in the manner of a carriage or truck. That the said jaw members 11 and 13 and their holding or jaw plates 12 and 14 may be opened and closed, as in-

indicated in Figs. 2 and 5, a system of compound levers may be employed, as clearly indicated in the several figures of the drawings, and these levers are arranged substantially as follows: One of the said body members, as 3, is provided with a downwardly-extending and perforated lug 27 at a point substantially midway between the two cross-bars or axles provided with the rollers or wheels, said body member being also provided with an upwardly-extending and perforated lug 28. Pivotaly connected with a pin or bolt 29 in the perforation of the lug 27 or in any other suitable manner is an actuating lever or arm 30, preferably provided at its upper end with a handle 21. This arm or lever 30 has a pivotal pin 32, to which is attached the bifurcated and perforated end portion 34 of a link 33, said link having its opposite bifurcated and perforated end portion 35 arranged upon the pin or stud 24 and preferably embracing the end portions of the two links 25 and 26, as illustrated. Pivotaly connected with a pin or bolt 36 in the perforation of the lug 28 or in any other suitable manner is an arm or link 37, which is provided with a pivot or pin 38. Pivotaly connected with this pin or pivot 38 is the one end of another link or links 40, having its opposite end pivotally connected, by means of a pin or pivot 41, with the said actuating lever or arm 30. The arm or link 37 is provided at its lower end portion with still another pivot or pin 42, to which is attached a pair of connecting rods or arms 43, between the opposite end portions of which is pivotally arranged upon a connecting-pin 44 an arm 45, provided at its free end with a hook 46, which is to be hooked into a link of the chain ordinarily employed with the draw-bench with which the draw-clamp or vise is to be used.

The operation of the draw-clamp or vise will be clearly evident from the above description and from an inspection of the accompanying drawings.

The operation of the device is briefly as follows: In its use with the draw-bench the device is placed upon the frame or bed of the draw-bench that it can be moved back and forth thereon by means of its wheels or rollers. To place the wire which is to be drawn or the sheet metal to be drawn over a molding or other piece between the holding or jaw plates by means of the handle 31, the actuating arm or lever 30 is thrown into the position indicated in Figs. 1 and 3 of the drawings, whereby the various arms and links will assume the positions indicated in said figures, and the links 25 and 26 of the toggle connection will be made to assume their straightened-out relation. (Indicated in Fig. 2 of the drawings.) This action produces the separated relation of the body members 2 and 3 and that of their holding-jaws to permit the piece which is to be drawn to be placed between the separated



jaws. The actuating arm or lever 30 by means of its handle 31 is then thrown in the position indicated in Fig. 4 of the drawings, whereby the various devices and parts are made to assume the positions indicated in said Fig. 4 and in Fig. 5, with the holding-jaws of the two body members 2 and 3 tightly closed over the end portion of the piece which is to be drawn, the piece being held between the said jaws in the manner of a vise. The hook 46 of the arm 45 is then hooked over a link of the chain of the draw-bench, and when the machine proper is set in operation the chain causes the draw-clamp or vise to be pulled over the bed or framework of the draw-bench, and it will be clearly evident from the arrangement of the system of compound levers and the toggle connection that the harder the pull the more tightly will the holding or grasping jaws of the members 2 and 3 be caused to grip the article which is to be drawn.

Of course we are fully aware that some changes may be made in the arrangements and combinations of the various devices and their parts, as well as in the details of the construction of the said parts, without departing from the scope of our present invention. Hence we do not limit our invention to the exact arrangements and combinations of the devices and parts as described in the foregoing specification and as illustrated in the accompanying drawings, nor do we confine ourselves to the exact details of the construction of the said parts.

Having thus described our invention, what we claim, is—

1. A draw-clamp or vise for draw-benches, comprising, a pair of jaw members pivotally connected near one end of said members, a toggle connection between the said jaw members located and operating near the holding-jaws of said members, and a system of compound levers operating between the pivotal connection of said jaw members and the said toggle connection, substantially as and for the purposes set forth.

2. A draw-clamp or vise for draw-benches, comprising, a pair of jaw members pivotally connected near one end of said members, a toggle connection between the said jaw members located and operating near the holding-jaws of said members, a system of compound levers operating between the pivotal connection of said jaw members and the said toggle connection, and means connected with a portion of said system of compound levers for connection with the movable parts of a draw-bench, consisting, essentially, of a pair of connecting-rods, and a hook-arm connected with said rods, substantially as and for the purposes set forth.

3. A draw-clamp or vise for draw-benches, comprising, a pair of jaw members pivotally connected near one end of said members, said

members being provided near their holding-jaws with chambered portions, a pivot-pin in each chambered portion, toggle-links pivotally connected with said pivot-pins, means for pivotally connecting the opposite ends of said toggle-links to each other, and means connected with said coupled ends of said toggle-links for connection with the movable parts of a draw-bench, substantially as and for the purposes set forth.

4. A draw-clamp or vise for draw-benches, comprising, a pair of jaw members pivotally connected near one end of said members, said members being provided near their holding-jaws with chambered portions, a pivot-pin in each chambered portion, toggle-links pivotally connected with said pivot-pins, means for pivotally connecting the opposite ends of said toggle-links to each other, and a system of compound levers operating between the pivotal connection of said jaw members and the coupled ends of said toggle-links, substantially as and for the purposes set forth.

5. A draw-clamp or vise for draw-benches, comprising, a pair of jaw members pivotally connected near one end of said members, a toggle connection between the said jaw members located and operating near the holding-jaws of said members, an actuating arm or lever pivotally connected with one of said members, a link between said arm or lever and the toggle connection, a second arm also pivotally connected with one of said jaw members, and a link between said second arm and said actuating arm or lever, and means connected with said second arm for connection with the movable part of a draw-bench, substantially as and for the purposes set forth.

6. A draw-clamp or vise for draw-benches, comprising, a pair of jaw members pivotally connected near one end of said members, mechanism at the opposite or jaw ends of said members for producing a closing or a separable movement of said jaw ends, and a system of compound levers operating between said closing and separating mechanism and the pivotal connection of said jaw members, substantially as and for the purposes set forth.

7. A draw-clamp or vise for draw-benches, comprising, a pair of jaw members pivotally connected near one end of said members, mechanism at the opposite or jaw ends of said members for producing a closing or a separable movement of said jaw ends, a system of compound levers operating between said closing and separating mechanism and the pivotal connection of said jaw members, and means connected with a portion of said system of compound levers for connection with the movable parts of a draw-bench, consisting, essentially, of a pair of connecting-rods, and a hook-arm connected with said rods, substantially as and for the purposes set forth.

8. The herein-described draw-clamp or vise for draw-benches, comprising, a pair of jaw



members pivotally connected near one end of  
said members, a holding-jaw at the opposite  
end of each member, and each member being  
provided near its jaw with a chambered por-  
5 tion, means in said chambered portions for  
producing a closing or a separable movement  
of said jaw members, a downwardly-extend-  
ing lug and an upwardly-extending lug on one  
of said members, an actuating arm or lever  
10 pivotally connected with said downwardly-ex-  
tending lug, a link between said arm or lever  
and the said closing and separating mechan-  
ism, a second arm pivotally connected with  
said upwardly-extending lug, a link between

said second arm and said actuating arm or le- 15  
ver, and means connected with said second  
arm for connection with the movable parts of  
a draw-bench, substantially as and for the  
purposes set forth.

In testimony that we claim the invention set 20  
forth above we have hereunto set our hands  
this 9th day of December, 1903.

AUGUST A. BERGHOF.  
FREDERICK W. THEBERATH.

Witnesses:

FREDK. C. FRAENTZEL,  
JOHN S. LA BAR.