No. 880,178. PATENTED FEB. 25, 1908.

H. L. THOMPSON.

WIRE DRAWING MACHINE.

APPLICATION FILED JUNE 5, 1905.

4 SHEETS—SHEET 1.

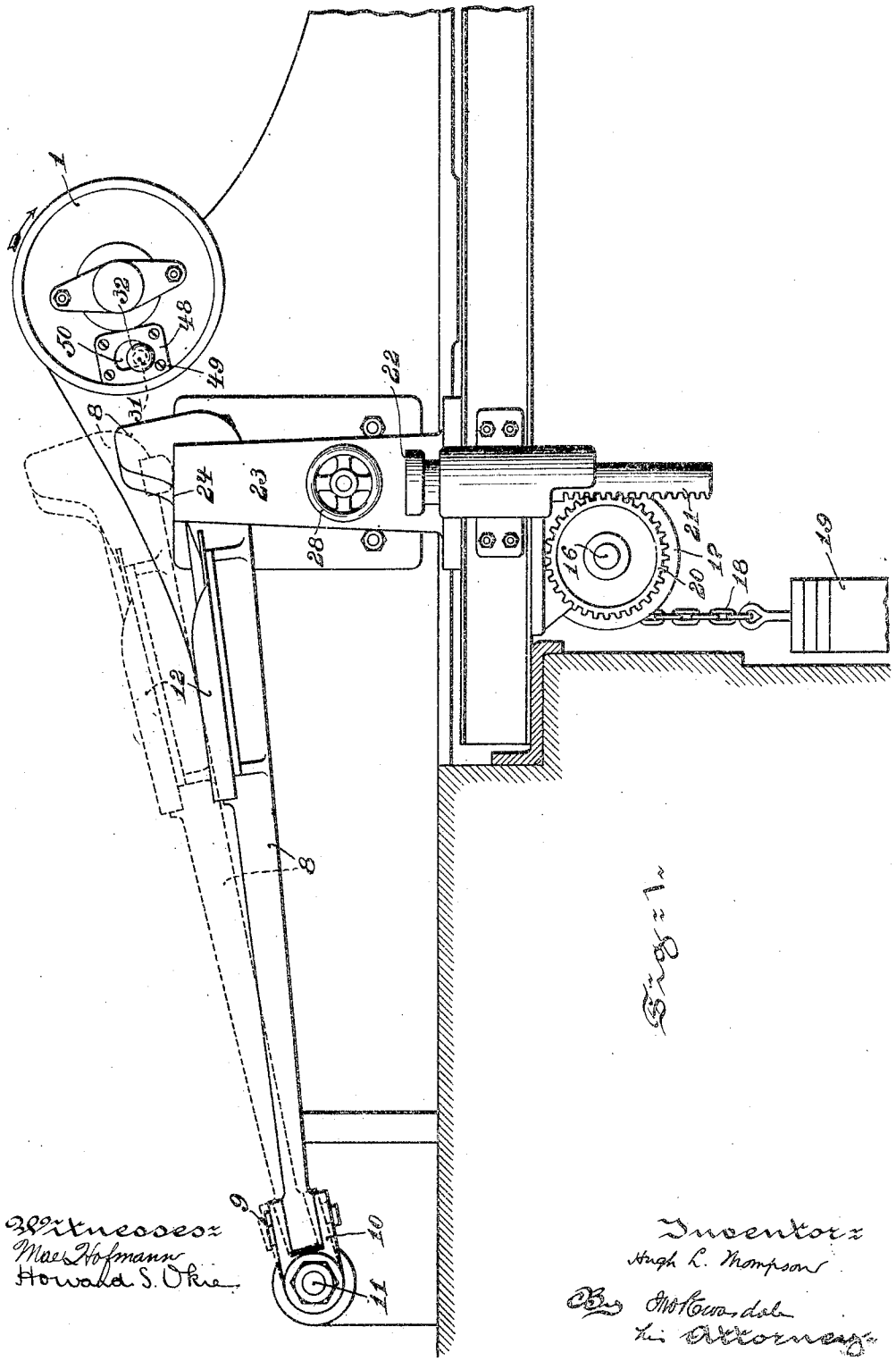


Fig. 1.

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4 SHEETS—SHEET 2.

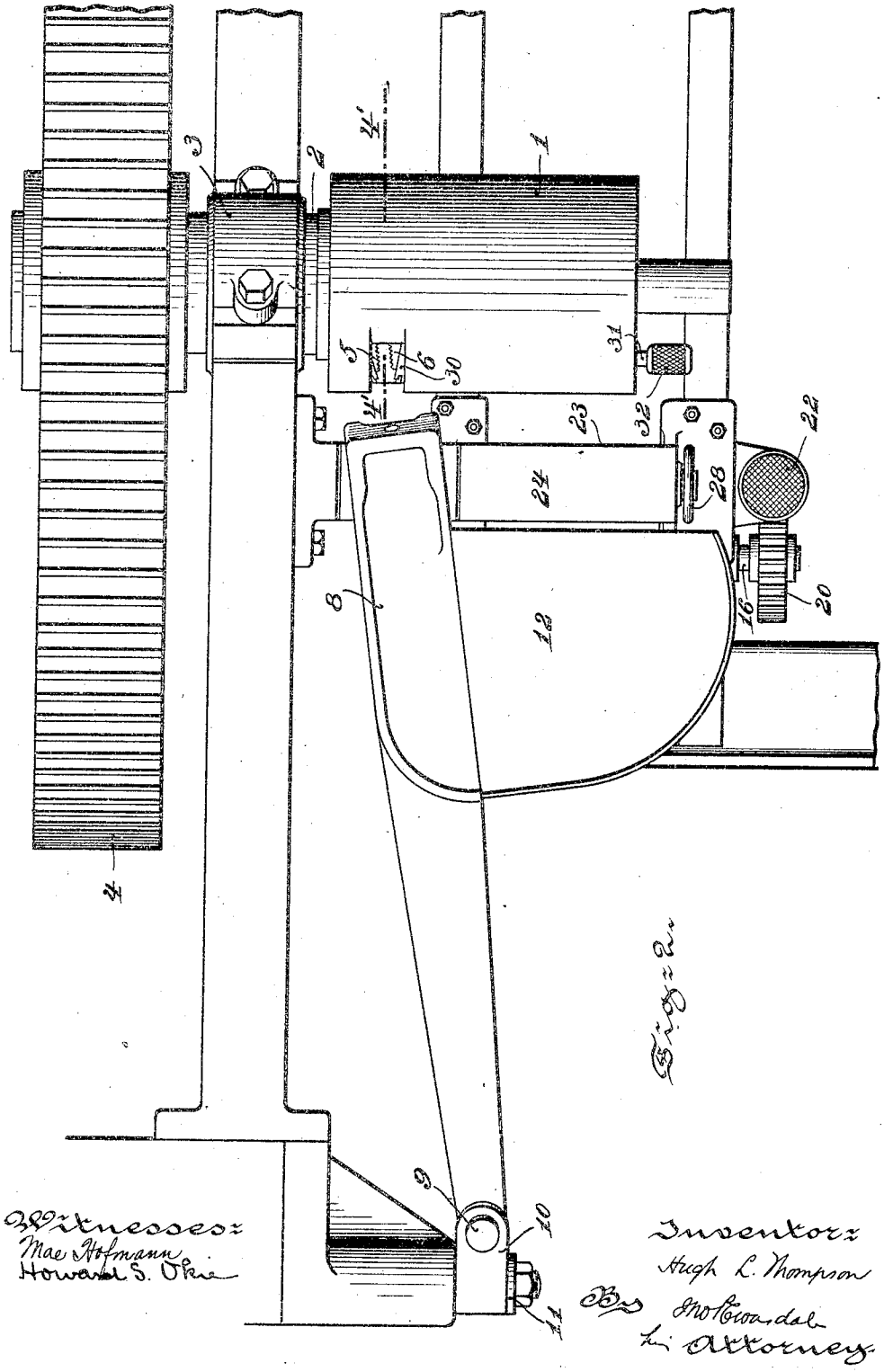


Fig. 2.

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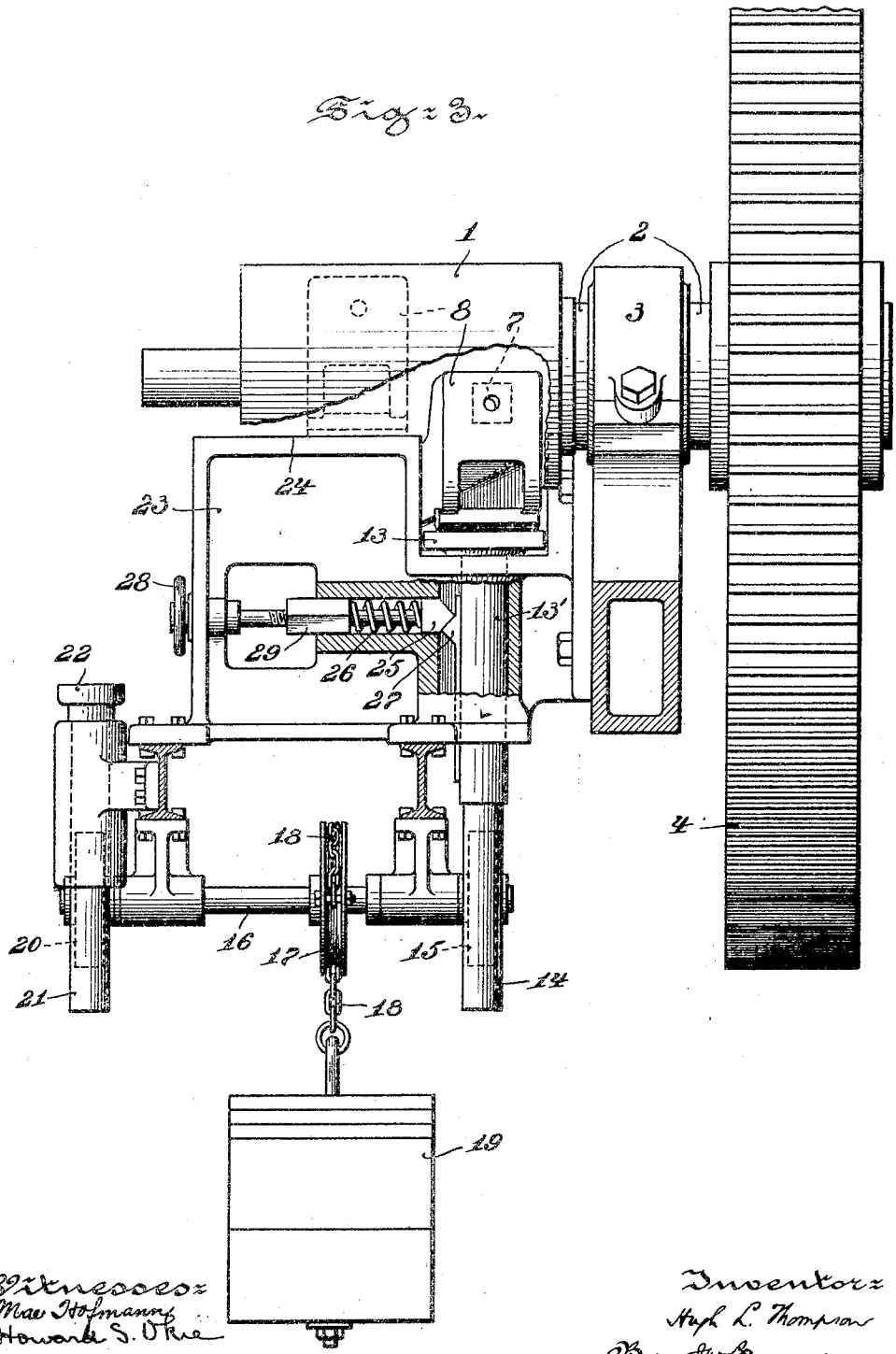
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4 SHEETS—SHEET 3.

Fig. 3.



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4 SHEETS—SHEET 4.

Fig. 4.

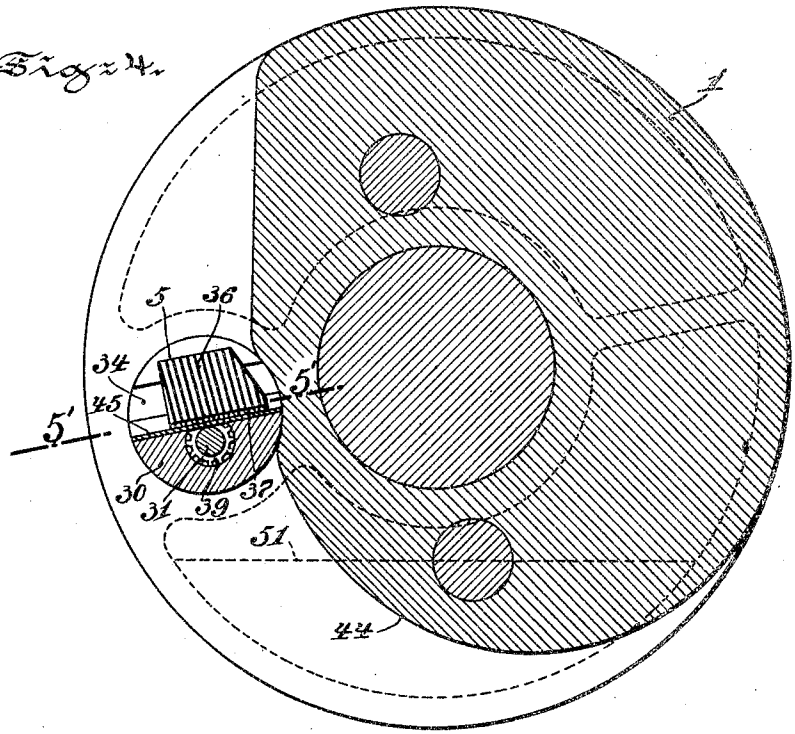


Fig. 5.

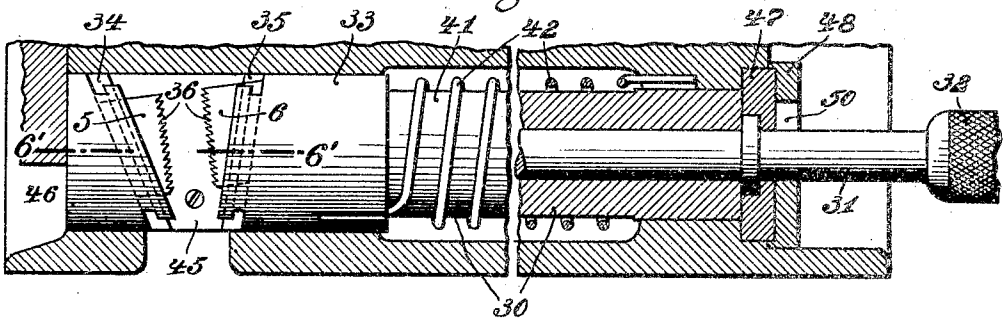
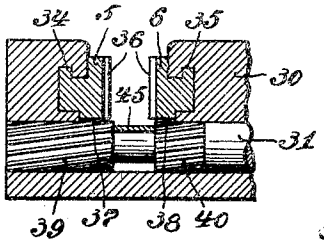


Fig. 6.



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UNITED STATES PATENT OFFICE.

HUGH L. THOMPSON, OF WATERBURY, CONNECTICUT.

WIRE-DRAWING MACHINE.

No. 880,178. Specification of Letters Patent. Patented Feb. 25, 1908.

Application filed June 5, 1905. Serial No. 263,762.

To all whom it may concern:

Be it known that I, HUGH L. THOMPSON, a citizen of the United States, residing at Waterbury, in the county of New Haven and State of Connecticut, have invented a new and useful Wire-Drawing Machine, of which the following is a specification.

My invention relates to improvements in wire drawing machines, especially to that class of wire drawing machines, usually known as bull block machines, which are adapted for the drawing of heavy wire.

My object is to provide improved means for supporting and moving the die, improved means for supporting the wire to be drawn, and improved gripping means for securing the wire to the block.

Figure 1 is a side elevation of my device in the preliminary position. Fig. 2 is a plan view of same. Fig. 3 is an elevation of my device with parts in section and a portion of the block broken away. Fig. 4 is a section on line 4′, 4′ of Fig. 2, but on an enlarged scale. Fig. 5 is a section on line 5′, 5′ of Fig. 4. Fig. 6 is a section on line 6′, 6′ of Fig. 5.

Similar numerals refer to similar parts throughout the several views.

Referring to the drawings, 1 represents the block rotated by shaft 2, having a journaled bearing 3, and driven through gear 4. The block is adapted to be operatively connected and disconnected with the shaft 2, in any of the usual and well-known ways, which not being part of my invention, is not shown. This block 1 is provided with the gripping jaws 5 and 6, supported and operated as hereinafter to be described. The die 7 is located and supported in the die member 8, which is pivotally secured at 9 to member 10, which is pivotally secured at 11 to the stationary framework. Upon member 8 is secured the pan 12 which is adapted to support the coil of wire as the same is being drawn through die 7. The machine illustrated in the drawings is adapted for very heavy grades of wire. For this reason the machine itself is ponderous and makes it desirable to provide mechanism for the convenient supporting and manipulation of the die member 8.

As will be seen in Fig. 3, the free end of die member 8 is supported when in the initial position upon the vertically movable table 13. This table has a vertical extension 13′ beneath it, which is provided with the rack 14, see Fig. 3, similar to that shown in Fig. 1, adapted to coöperate with the pinion 15, said pinion 15 being keyed to the shaft 16 which carries the pulley 17. Pulley 17 is provided with chain 18 and weight 19. By this means it will be seen that the weight of die member 8 communicated to table 13 is counterbalanced by the weight 19 operating on pulley 17. Upon the shaft 16 is also provided the pinion 20 which is adapted to coöperate with the rack 21 operated by pedal 22 so that by pressing the foot upon pedal 22 the counterbalancing effect of weight 19 may be overcome.

As will be seen from an inspection of Fig. 3, the table 13 is elevated and depressed in the space provided therefor in framework 23. The upper horizontal portion 24 of which forms a support and guide for the horizontal movement of the die member 8, that is, assuming the die member to start from the initial position shown in Fig. 3 the rotation of the block 1 in the direction of the arrow shown in Fig. 1, causes the elevation of the die member 8 and table 13, resulting from the pull of the wire through the die, until the top of table 13 has come into alinement with the top of horizontal portion 24, and the die member 8 is then free to swing horizontally as the wire travels along the block 1 with each fold thereon. As the weight 19 is adapted normally to counterbalance the weight of the die when the coil or wire is resting upon pan 12, it will ordinarily result that when the wire has been entirely drawn through the die leaving pan 12 empty, it will be necessary in returning the die member 8 to the initial position as shown in Fig. 3, to exert pressure upon the foot pedal 22, to overcome the counterbalancing effect of weight 19. The keeper 25, controlled by the spring 26, is adapted to coöperate with the lug 27 on member 13′ to lock the table 13 in the depressed position, when it has been returned thereto as above described, or rather this spring catch mechanism is adapted to hold the table 13 in the depressed position when first returned to such a position, and prevent the bouncing thereof after the foot is removed from pedal 22. The desired tension of spring 26 is secured by the screw operated plunger 29 through hand wheel 28.

Means are also provided for automatically returning the block 1 to the initial position after the wire drawing operation has been discontinued, so as to be ready to connect with more wire in the initial or radial direc-

tion. This automatic means is provided by properly loading the block 1, which consists preferably in pouring lead into the hollowed out portion of the block to a suitable level, as indicated for example by the dotted line 51 in Fig. 4, so that when it is set, it will serve as a counterbalance or gravity means for normally returning the block to said initial position with respect to the die, when the block is disconnected from operative relationship with this driving shaft.

A preferred form of gripping device suitable for coöperation with the block above described, is illustrated in detail in Figs. 4, 5 and 6. Referring to Figs. 4 and 5 the journaled member 30 is seated in a suitable aperture in block 1 and is adapted to have a limited rotative movement therein. Through the entire longitudinal extension of journaled member 30 extends the spindle 31, eccentric with journaled member 30 and rotatable therein. Spindle 31 is provided with a knurled head 32 for its manual operation. It is to be noted that journaled member 30 has an enlarged end 33 which is cut out upon one side and provided with the convergent channels or ways 34 and 35. In these convergent channels or ways 34 and 35 are suitably seated the jaws 5 and 6 respectively, adapted to slide therein toward and away from each other. These jaws 5 and 6 are preferably provided with the serrated surfaces 36 to increase their efficiency of grip. At the rear of these jaws 5 and 6 are provided the serrations 37 and 38 forming racks for coöperation with the pinions 39 and 40 provided on spindle 31. In view of the tilt of the plane of the contact faces 36, see Fig. 5, it will be obvious that the line of travel of jaw 5 will be at an angle greater with respect to the axis of spindle 31 than that of jaw 6. For this reason the longitudinal extension of pinion 39 is greater than that of 40.

It will be obvious from the construction above described that the turning of the knurled head 32 will cause the rotation of pinions 39 and 40 to move the jaws 5 and 6 backward and forward in their convergent seats so that the contact faces 36 of said jaws 5 and 6 may be brought together or separated from each other. When said jaws have come in contact with the wire to grip the same, any pull of the wire will tend to draw the jaws closer together and to increase the efficiency of their grip. Around the narrower portion 41 of journaled member 30 is provided the spring 42 operating between said journaled member 30 and the surrounding block 1, for the purpose of normally maintaining said journaled member and consequently the gripping jaws in the initial position, namely the position in which the wire is secured and held radially with respect to the block 1. The spindle 31, carried by the journaled member 30, has a translative movement in aperture 50 of plate 48, and is adapted to come into contact with the extremes of said aperture to limit the rotative movement in either direction of said journaled member 30. The said elements are so associated that after the wire has been secured in the jaws and the block started to rotate in the direction of the arrow shown in Fig. 1, the whole journaled member 30 with jaws 5 and 6 will rotate with respect to the block in the direction opposite from the direction of the rotation of the block to lay the wire upon the elliptical surface 44, of said block without any sharp bending of said wire. The plate 45 is suitably secured in the gap or recess of said member 30 to protect the teeth of pinions 39 and 40 from grit and chips.

The method of securing the journaled member and its associated mechanisms in the block is as follows: The said journaled member is inserted in the recess provided therefor in the block through the end 46. The plate 47 is then secured by screws not shown or other suitable means to the end of journaled member 30 and projects beyond the peripheral surface of journaled member 30 to coöperate with shoulders in block 1 to prevent the withdrawal of member 30 from the block. A further plate 48 is secured to the end of the block by screws 49, see Fig. 1, or other suitable means, to prevent the movement of the journaled member 30 in the opposite direction. Thus the journaled member while having limited rotation in the block, is secured against longitudinal movement therein.

What I claim is:—

1. In a wire drawing machine, the combination of a block having a horizontal axis of rotation, a die holder, a counterbalanced elevating device therefor and rack and pinion means for operating the same.

2. In a wire drawing device, the combination of a block having a horizontal axis of rotation, a die holder, a coil supporting device connected therewith, a counterbalanced elevating device therefor and means for arbitrarily operating said elevating device.

3. In a wire drawing device, the combination of a block having a horizontal axis of rotation, a coil supporting and die holding member, mechanism for elevating and lowering said member comprising a pinion mounted on a counterbalanced shaft and a rack for coöperating therewith, and arbitrary means for depressing said counterbalanced member.

4. In a wire drawing machine, the combination of a block having a horizontal axis of rotation, a die holder, a counterbalanced elevating device therefor, rack and pinion ears for operating the same, and a spring

controlled keeper for the counterbalanced mechanism.

5. In a wire drawing machine, the combination of a block having a horizontal axis of rotation, gripping mechanism connected therewith, a pivoted die holder and a counterbalanced elevating device therefor, a table connected with the elevating device, and rack and pinion means for its operation.

6. In a wire drawing machine, the combination of a block having a horizontal axis of rotation, gripping mechanism connected therewith, a pivoted die holder therefor, a counterbalanced elevating device for the die holder comprising a counterbalanced shaft, a rack and pinion having operative relationship therewith, and a further rack and pinion means for the arbitrary actuation of said shaft.

7. In a wire drawing device, the combination of a block having a horizontal axis of rotation, a vertically and horizontally movable die holder, a counterbalanced elevating device for controlling its vertical movement and supporting means for horizontal movement.

8. The combination of a wire drawing block having horizontal axis, gripping jaws having a rotatable relation therewith, a movable die holder adapted to move from the radial to the tangential position with respect to the block, arbitrary means for moving the die holder to the radial position and counterbalancing means for normally bringing the block into initial position in which the gripping jaws are in radial alinement with the die holder.

9. The combination of a wire drawing block having horizontal axis, gripping jaws having a pivotal relation therewith, a die holder, a vertically movable support therefor, means for arbitrarily returning the die holder to initial position in line with the radius of the block, and an eccentric load on the block to normally return the block to a position in which the gripping jaws shall be in radial alinement with the die holder when in said initial position.

10. In combination with a wire drawing block, a cylindrical member journaled in the block, and extending parallel with the axis of the block and provided with transversely extending gripper jaws.

11. In combination with a wire drawing block, a cylindrical member journaled in the block, and extending parallel with the axis of the block, said cylindrical member having a transverse recess and provided with convergently movable gripper jaws.

12. In combination with a wire drawing block, a cylindrical member journaled in the block, and extending parallel with the axis of the block, said cylindrical member having a transverse recess and provided with convergently movable gripper jaws, and rack and pinion means for operating the gripper jaws, the pinion journaled in the cylindrical member having its axis parallel with the axis of said cylindrical member.

13. The combination with a wire drawing block, a cylindrical member journaled in the block, and extending parallel with the axis of the block and provided with transversely extending gripper jaws, and spring operating between the cylindrical member and the block for maintaining said member in initial position.

14. In combination with a wire drawing block, a cylindrical member journaled in the block, and extending parallel with the axis of the bock, said cylindrical member having a transverse recess and provided with convergently movable gripper jaws and manually operative rack and pinion means for actuating the jaws.

15. In combination with a wire drawing block, a cylindrical member extending substantially through the longitudinal extent of the block and journaled in said block, said cylindrical member provided with transverse convergent recesses or ways and gripper jaws movably seated in said recesses and means for the arbitrary actuation of said jaws.

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