J. M. LUERS.

CENTER DRILLING JIG.

APPLICATION FILED APR. 4, 1917.

1,292,620. Patented Jan. 28, 1919.

Fig. 1.

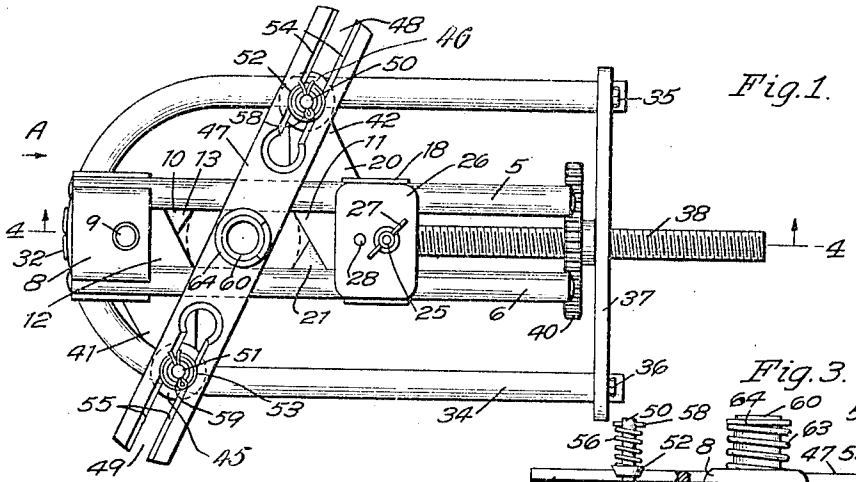


Fig. 3.

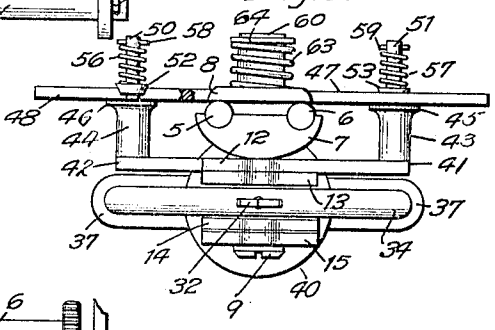


Fig. 2

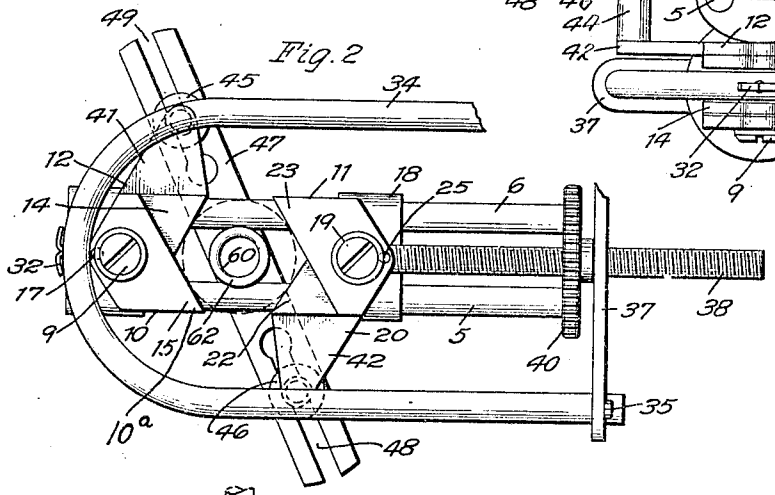
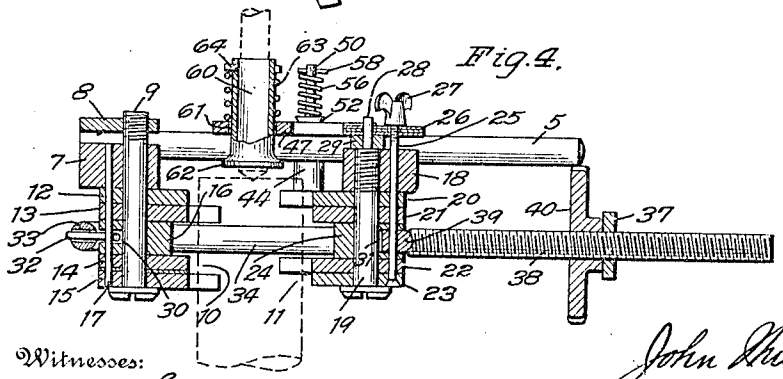


Fig. 4.



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CENTER-DRILLING JIG.

1,292,620. Specification of Letters Patent. **Patented Jan. 28, 1919.**

Application filed April 4, 1917. Serial No. 159,599.

To all whom it may concern:

Be it known that I, JOHN MILTON LUERS, a citizen of the United States of America, and resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in Center-Drilling Jigs, of which the following is a specification.

An object of my invention is to produce an improved center drilling jig of compact form and capable of adjustment to mark the centers of objects of various sizes and shapes.

A further object is to produce an improved center drilling jig constructed of materials of stock shapes and sizes and necessitating in its construction a minimum amount of machine operations.

A further object is to produce an improved center drilling jig in which accuracy of operation will not be impaired by wear through continued use of the jig.

A further object is to produce an improved center drilling jig which may be brought quickly into position for use upon objects of various sizes and shapes.

These and other objects are attained in the jig described in the following specification, and illustrated in the accompanying drawings, in which;

Figure 1 is a plan view of my improved jig.

Fig. 2 is a reverse plan view of the jig disclosed in Fig. 1, a portion thereof being broken away for convenience of illustration.

Fig. 3 is an end view looking in the direction of the arrow A in Fig. 1.

Fig. 4 is a longitudinal sectional view taken on the line 4—4 of Fig. 1.

My improved jig has two guide rods 5 and 6 united at their ends by a clamp consisting of a block 7 and a plate 8, a screw 9 being employed for holding the block and plate in clamping engagement with the rod. Screw 9 is also employed for retaining the stationary jaw 10 of the jig in position to coöperate with a relatively movable jaw 11. Stationary jaw 10 consists of a series of plates 12, 13, 14 and 15, with a block 16 located between the pairs of plates 12 and 13, and 14 and 15. The screw 9 is passed through these plates and through blocks 16 and 7, into screw threads formed in plate 8 of the clamp. This holds the elements of the clamp and the stationary jaw, together with the guide rods 5 and 6. In order to prevent plates 12 and 13 as well as plates 14 and 15 moving relatively to one another I have provided a pin 17 which passes through them and through blocks 16 and 7. This pin, together with screw 9, positively prevents displacement of the plates from their positions. Each of the plates is provided with a pointed end 10^a, these ends extending at angles to one another to present an angle between the legs of which the object to be center drilled, is located. Adjustable jaw 11 consists of a block 18 reciprocally mounted upon guide rods 5 and 6 and having a screw 19 which retains the plates 20 and 21, and plates 22 and 23, as well as a block 24 of the relatively movable jaw construction, in position. A pin 25 is passed through plates 20 to 23 inclusive as well as through blocks 18 and 24 for the purpose of retaining these elements against displacement in the same manner that pin 17 retains plates 12 to 15 inclusive as well as blocks 7 and 16 in position. However, pin 25 of the sliding jaw construction is extended above rods 5 and 6 and through spring plates 26 for the purpose of receiving a thumb nut 27 thereon so as to retain the plates 26 and lock 18 in frictional sliding engagement with rods 5 and 6. To prevent plates 26 from becoming displaced from position on rods 5 and 6, I have provided an extension 28 of screw 19 which passes through the plates 26 adjacent to pin 25. Mounted on this extension is a block 29 which is provided for rendering the plates 26 somewhat more rigid adjacent to the portion which is sprung by the thumb nut 27.

Blocks 16 and 24 are provided with recesses 30 and 31 respectively. Recess 30 is adapted to receive the looped end of a cotter pin 32 the split end of which passes through an opening 33 in the base of a clevis 34 which extends on each side of guide rods 5 and 6 and is located somewhat beneath them as shown in Figs. 3 and 4. The ends of the clevis are perforated to receive pins 35 and 36 for the purpose of retaining a plate 37 in position thereon. Plate 37 is centrally perforated to pass a screw threaded bolt 38 which extends from block 24 and which is is secured thereto by having its end 39 located in recess 31, the end 39 being adapted to be secured in position in the recess by having pin 25 pass through it as disclosed

in Fig. 4. Mounted upon this bolt is an adjustment nut 40 by means of which the movable jaw after having been approximately positioned with relation to the stationary jaw and an object to be drilled, may be accurately brought into position to clamp the object between the jaws, the nut in this operation bearing against plate 37. Plates 12 and 20 are provided with extensions 41 and 42 respectively, upon which are mounted studs 43 and 44 respectively. These studs are provided with flanges 45 and 46 respectively, upon which are located a swinging arm 47. The ends of this arm are provided with slots 48 and 49 which are adapted to receive extensions 50 and 51 of the respective studs 44 and 43. Upon these extensions are mounted sliding collars 52 and 53 which are frusto-conical in shape and which engage the beveled sides 54 and 55 of the respective slots 48 and 49. These collars are engaged by coiled springs 56 and 57 mounted upon the extensions 50 and 51, the opposite ends of the springs being held in position by means of pins 58 and 59 passing through openings formed in the upper ends of the extensions 50 and 51. Midway between the ends of arm 47 a sleeve 60 is reciprocally mounted in an opening 61 formed in the arm. The lower end of sleeve 60 passes between guide rods 5 and 6 and is flared outwardly to provide an enlarged flange 62 adapted to bear against the under sides of the guide rods when the sleeve is lifted. For the purpose of holding the sleeve in the position disclosed in Fig. 4, I have provided a spring 63, the upper end of which engages the split washer 64 secured to the upper end of the sleeve. The pressure of spring 63 then acts to lift sleeve 60 to bring its end 62 into engagement with the under surfaces of bars 5 and 6.

When it is desired to center drill an object, such as the center of a shaft, as indicated in dotted lines in Figs. 1, 2 and 4, the jig is placed in position upon the end of the shaft with its stationary jaw in engagement with the curved side thereof. The reciprocally mounted jaw is then brought into engagement with the opposite curved side of the shaft by sliding its block 18 upon guide rods 5 and 6. Adjustment nut 40 is then brought into engagement with plate 37 at the end of clevis 34. The nut is then operated to bring the movable jaw into such a position that the jig is held firmly upon the shaft. During this movement of the movable jaw, arm 47 by reason of movement of stud 44, is swung about extension 51 of stud 43. In addition to this swinging movement of the arm, some sliding movement of the extensions 50 and 51 in their respective mounting slots 48 and 49, takes place. This is because sleeve 60, which operates between guide rods 5 and 6, holds arm 47 centrally. This being true the axis of sleeve 60 will be brought into accurate alinement with the axis of the shaft or other object located between the jaws 10 and 11. This axial alinement of the sleeve with the axis of the object is true whether the object vary in its size or shape. For this reason objects of square, hexagon, octagon, or other formation, such as may be encountered in stock metal, may be accurately centered. The springs 56, 57 and 63 upon the extensions 50, 51 and upon sleeve 60, in coöperation with the conically shaped collars 52 and 53 together with the conically shaped end 62 of the sleeve 60, operate to maintain the jig always in a condition of accuracy, lost motion created by wear between the movable parts being taken up by these springs. The drilling of the center of the object is then accomplished by placing a center drill which is made to fit the sleeve accurately, in position therein, a drilling machine being brought into engagement with the drill to make the impression in the object. It will be seen that the connection of clevis 34 with block 16 is a loose one and that the connection of bolt 38 with block 24 is also a loose one. This is for the purpose of avoiding any strains being imposed upon the guide rods 5 and 6 to throw the jaws 10 and 11 out of accurate alinement with one another and thus destroy the accuracy of the jig, when adjustment nut 40 is brought to bear against plate 37.

In using my improved jig the adjustable jaw may be moved quickly into position to engage the object to be center drilled, and then the accurate positioning of the jaws with relation to the object is obtained by means of the clamping nut 40 upon bolt 38.

Having thus described my invention, what I claim is:

1. A center drilling jig consisting of a guide rod, a stationary jaw secured to one end of the guide rod, an adjustable jaw reciprocally mounted upon the guide rod, and a center drill receiving member having movement separate from and operatively connected with the jaws, adapted automatically to be adjusted when said jaws are adjusted to engage an object to be drilled, whereby the receiving member will be positioned to guide a center drill located therein centrally of the object to be drilled.

2. A center drilling jig consisting of a guide rod, a stationary jaw secured to one end of the guide rod, an adjustable jaw reciprocally mounted upon the guide rod, a center drill receiving member having movement separate from and operatively connected with the jaws, adapted automatically to be adjusted when said jaws are adjusted to engage an object to be drilled, whereby the receiving member will be positioned to guide a center drill located therein centrally of an object to be drilled, and means adapted

to bring said adjustable jaw into clamping engagement with an object located between it and the stationary jaw.

3. A center drilling jig consisting of a pair of guide rods, a stationary jaw secured to the rods at one end, an adjustable jaw reciprocally mounted upon the guide rods, and a center drill receiving member having movement separate from and operatively connected with the jaws, adapted automatically to be adjusted when said jaws are adjusted to engage an object to be drilled, whereby the receiving member will be positioned to guide a center drill located therein, between the guide rods, and centrally of the object to be drilled.

4. A center drilling jig consisting of a pair of guide rods, a stationary jaw secured to the guide rods at one end, an adjustable jaw reciprocally mounted upon the guide rods, a center drill receiving member having movement separate from and operatively connected with the jaws, adapted automatically to be adjusted when said jaws are adjusted to engage an object to be drilled whereby the receiving member will be positioned to guide a center drill located therein, between the rods and centrally of the object to be drilled, and means for bringing the adjustable jaw into clamping engagement with the object located between it and the stationary jaw.

5. A center drilling jig consisting of a guide rod, a stationary jaw secured to one end of the guide rod, an adjustable jaw reciprocally mounted upon the guide rod, a swinging arm pivotally and reciprocally mounted at its center upon the guide rod, and means engaging the ends of the arm for reciprocation therewith and connected with the jaws, whereby the arm will be swung to bring its center into positions midway between the jaws when the reciprocally mounted jaw is moved, said arm having a center drill receiver adapted to guide a drill located therein centrally of an object to be marked when the reciprocally mounted jaw is moved into clamping engagement with an object located between it and the stationary jaw.

6. A center drilling jig consisting of a pair of guide rods, a stationary jaw secured to one end of the guide rods, an adjustable jaw reciprocally mounted upon the guide rods, a swinging arm pivotally and reciprocally mounted between the rods, means reciprocally mounted at the ends of the arm and connected with the jaws, and a center drill receiver mounted on the arm between the rods, said arm when swung by reciprocation of the reciprocally mounted jaw on the rods, being adapted to move the center drill receiver centrally of an object located between the jaws when the reciprocally mounted jaw is brought into clamping engagement with an object located between it and the stationary jaw.

7. A center drilling jig, consisting of a guide rod, a stationary jaw secured to one end of the guide rod, an adjustable jaw reciprocally mounted upon the guide rod, a center drill receiving member operatively connected with the jaws, adapted to be adjusted when said jaws are adjusted to engage an object to be drilled, whereby the receiving member will be positioned to guide a center drill located therein centrally of the object to be drilled, and means adapted automatically to take up lost motion created by wear in the parts, operatively connected with the jaws, the receiving member, and the guide rod.

8. A center drilling jig consisting of a pair of guide rods, a stationary jaw secured to one end of the guide rods, an adjustable jaw reciprocally mounted upon the guide rods, a center drill receiving member operatively connected with the jaws, adapted to be adjusted when the jaws are adjusted to engage an object to be drilled whereby the receiving member will be positioned to guide a center drill located therein centrally of the object to be drilled, and means operatively connected with the jaws, the receiving member, and the rods, adapted to take up lost motion occasioned by wear in the parts and to maintain the accuracy of the jig.

In testimony whereof, I have hereunto subscribed my name this 2nd day of April, 1917.

JOHN MILTON LUERS.

Witnesses:
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."