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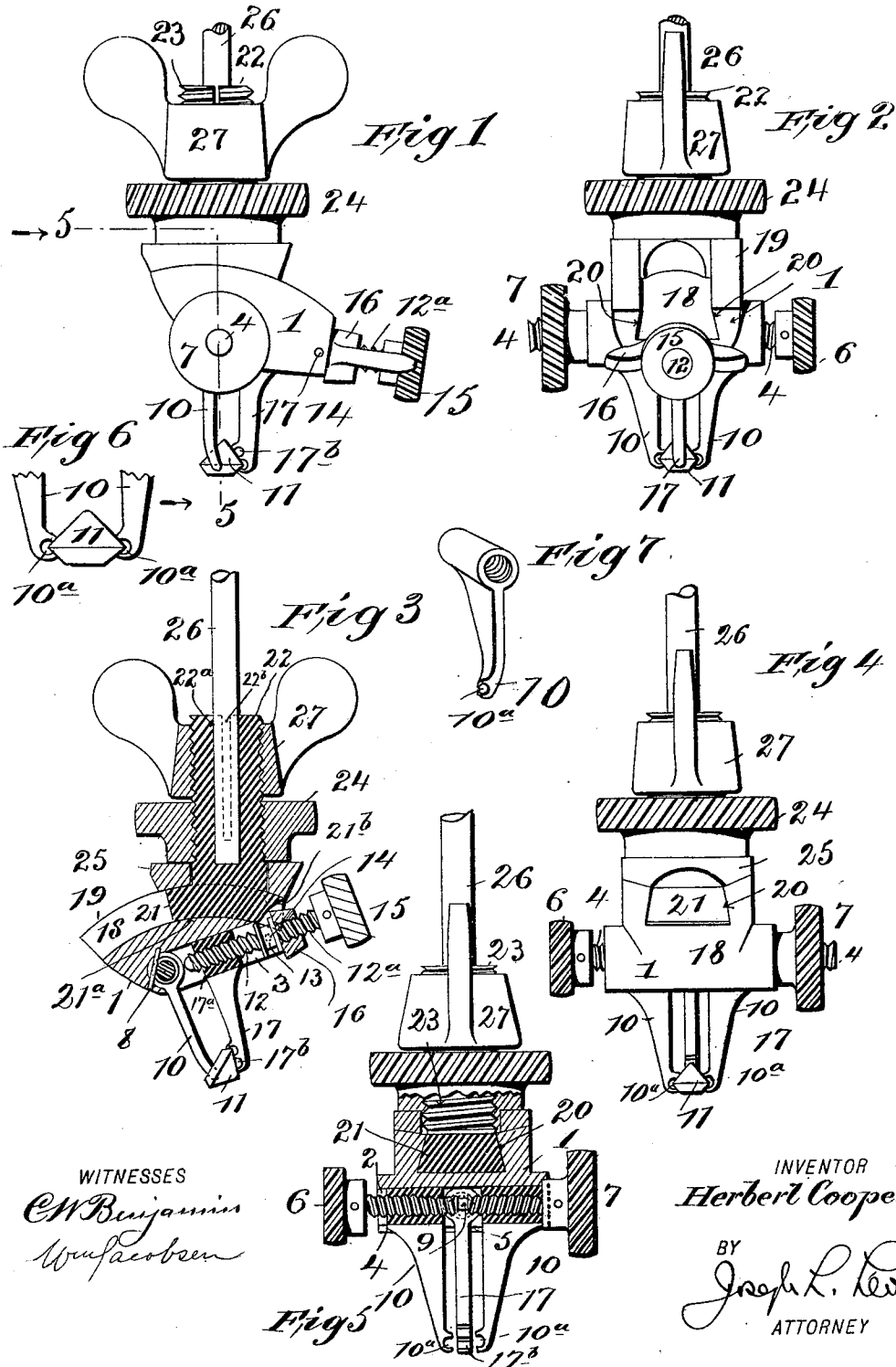
Patented Aug. 22, 1899.

H. COOPER.
DIAMOND POLISHING DOP.

(Application filed Aug. 10, 1898.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES
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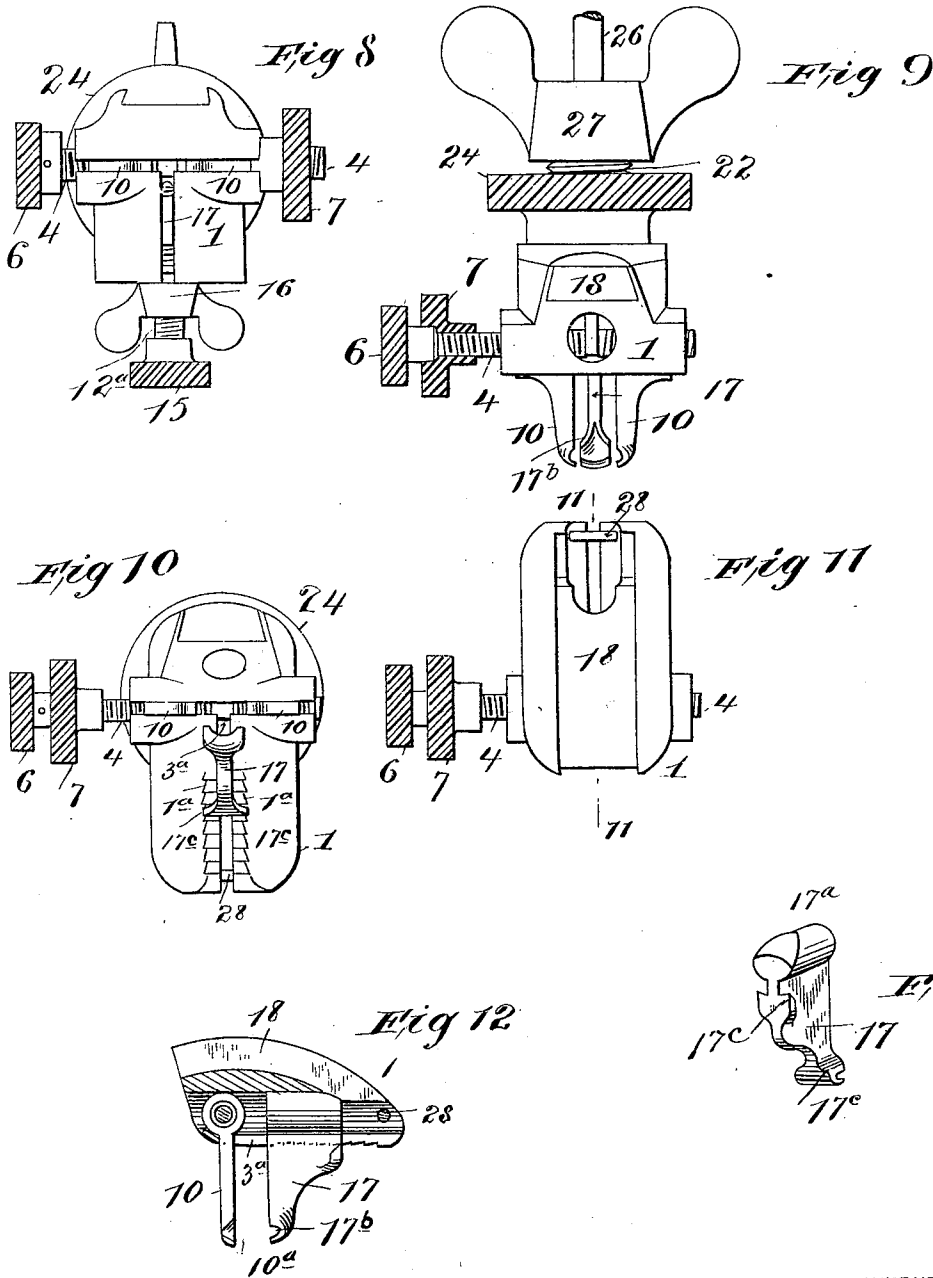
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WITNESSES

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UNITED STATES PATENT OFFICE.

HERBERT COOPER, OF JERSEY CITY, NEW JERSEY.

DIAMOND-POLISHING DOP.

SPECIFICATION forming part of Letters Patent No. 631,562, dated August 22, 1899.

Application filed August 10, 1898. Serial No. 688,262. (No model.)

To all whom it may concern:

Be it known that I, HERBERT COOPER, a citizen of the United States, residing at Jersey City, county of Hudson, and State of New Jersey, have invented new and useful Improvements in Diamond-Polishing Dops, of which the following is a specification.

The object of my invention is to provide new and useful improvements in diamond-polishing dops, to the end that stones of varying sizes may be readily adjusted in an operative central position, and whereby the stone can be adjusted to various angles relatively to the polishing-surface and held firmly in such positions.

The invention consists in a dop comprising a head, a pair of jaws movable toward and from each other, a supplemental jaw movable at an angle to the other jaws, which jaws are adapted to hold a stone to be polished, and means for supporting said head.

The invention further consists in a dop comprising a head, a pair of jaws movable toward and from each other, a supplemental jaw movable at an angle to the other jaws, which jaws are adapted to hold a stone to be polished, a stem to support said head, and means for adjusting said head on a curve across the plane of the longitudinal axis of said stem.

The invention also consists in a dop comprising a head, means carried thereby for holding a stone to be polished, said head having a curved groove, a block located in said groove, means for detachably securing said block to said head, and a stem adapted to be secured to said block.

The invention also consists in a diamond-polishing dop comprising a head having two bores, one at right angles to the other, a right and left threaded screw or worm in one bore, stone-holding jaws projecting from said bore and threaded on said screw or worm, means for locking the parts in a set position, a screw located in the other bore and a stone-holding jaw threaded on said screw and projecting from said bore to coact with the first-mentioned jaws in holding a stone, means for holding the last-mentioned jaw in a set position, and means for supporting said head.

The invention also consists in the novel de-

tails of improvement and the combinations of parts that will be more fully hereinafter set forth and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part hereof, wherein—

Figure 1 is a side elevation of a dop embodying my invention. Fig. 2 is a view at right angles thereto, looking from the right. Fig. 3 is a vertical section of Fig. 1, showing the head in a different position of adjustment. Fig. 4 is a side view looking from a position diametrically opposite that shown in Fig. 2. Fig. 5 is a section on the line 5 5 in Fig. 1, looking in the direction of the arrows. Fig. 6 is a detail view, enlarged, of the stone-holding jaws that operate in conjunction. Fig. 7 is a detail perspective view of one of the jaws. Fig. 8 is an under plan view of the dop. Fig. 9 is an end view of a dop embodying a modification. Fig. 10 is an inverted plan view thereof. Fig. 11 is a top plan view thereof. Fig. 12 is a central section on the line 11 11 of Fig. 11, and Fig. 13 is a detail view of the sliding jaw of Fig. 9.

Similar numerals of reference indicate corresponding parts in the several views.

In the accompanying drawings, 1 indicates a head, which is shown in the form of a block and provided near one end with a bore 2, that opens through both sides of the head, and 3 is a bore that opens into the bore 2, extends at right angles thereto, and opens through one end of the head. (See Fig. 3.) Within the bore 2 is located a right and left threaded worm or screw 4, whose ends (see Figs. 1, 2, 3, 4, and 5) both project beyond the dop-head, and one wall of the head in line with the bore 2 is slotted to form an opening into said bore, as at 5.

6 is a thumb-piece or handle secured upon the screw or worm 4, by which the same may be rotated, and 7 is a nut threaded upon said screw or worm at the opposite end to thumb-piece 6, so that when screwed up against the side of the head 1 the screw or worm 4 will be locked rigidly in position.

8 is a pin or stop shown carried by head 1 and located in annular groove 9 in the screw or worm shaft 4 to keep the same from moving endwise.

10 10 are a pair of jaws adapted to grasp a stone 11 between them, which jaws have threaded bores adapted to receive the threads upon the worm or shaft 4, the inner ends of
5 said jaws being adapted to fit within the bore 2 in head 1 and to travel toward and from each other therein, which jaws project through the slot 5 in said head. By the arrangement shown when the shaft 4 is rotated back or
10 forth the jaws 10 will be caused to travel toward and from each other in unison and in equal degrees of movement. At their outer ends the jaws 10 have recesses or sockets 10^a, adapted to receive the edges of the stone 11
15 that is to be polished.

Within the bore 3 is located a threaded shaft or screw 12, that is adapted to rotate, but is prevented from having endwise movement by means of a groove 13, that receives
20 a pin 14, projecting from head 1 into said groove. (See Figs. 1 and 3.) It will be seen that the material of the screw or threaded shaft 12 at the sides of the groove 13 is of a greater diameter than the threaded portion of
25 the screw, thus forming annular shoulders that fit within the bore 3 and serve as bearings for said screw or threaded shaft. (See Fig. 3.) Upon the outer end of screw or threaded shaft 12 is secured a thumb-piece or
30 handle 15, by which said shaft can be rotated, and between said thumb-piece and the groove 13 are screw-threads 12^a, upon which a nut 16, preferably a wing-nut, is adapted to work, by which the screw or threaded shaft
35 12 can be locked in any desired position by screwing the nut 16 firmly against the head 1.

17 is a jaw that is adapted to coact with the jaws 10 in holding the stone 11, the inner end or head 17^a of said jaw 17 having a threaded
40 bore to receive the threads upon the inner portion of screw or threaded shaft 12, the head 17^a of jaw 17 being located in the bore 3 and adapted to travel therein, the jaw 17 projecting through a slot in the head 1, that
45 opens into said bore. At its outer end the jaw 17 may have one or more recesses or sockets 17^b to engage the edge of a stone to coact with the sockets 10^a of jaws 10 in holding said stone.

50 From the foregoing it will be understood that when it is desired to hold a stone the jaws 10 are spread apart sufficiently to receive the stone between them and are then adjusted toward each other so as to grasp the
55 stone, and the jaw 17 is set up against the edge of the stone at right angles to the points where the jaws 10 engage the stone, by which means stones of varying sizes can be readily connected to the head 1, and by means of
60 the thumb-pieces 7 and 16 the jaws can be held locked, so that there will be no danger of the stone slipping from between the jaws.

The dop-head above described may be supported in any suitable manner, so that the
65 stone can be presented to the polishing-sur-

face. It is preferred, however, that the head 1 be so supported that it can be readily adjusted in various positions relatively to the polishing-surface. For these purposes I have shown the following arrangement: In the side
70 of the head 1, opposite the jaws 10 and 11, is an arcuate groove 18, and the outer surface of the head at this part is correspondingly curved at 19, the side walls of the groove 18 being shown undercut or beveled out-
75 wardly, as at 20. (See Figs. 2 and 4.) Within the groove 18 is a block 21, that has outwardly-beveled sides to correspond with the sides 20 of groove 18, and the under surface of said block is shown curved at 21^a to rest upon the
80 curved bottom of groove 18. (See Fig. 3.) From the block 21 extends a post 22, provided with external screws-threads 23, upon which a thumb-nut 24 is adapted to work to jam the block 21 in the groove 18, and by preference
85 between the curved edge 19 of head 1 and the thumb-nut 24 is located a washer 25, that has a bore to receive the post 22, the thumb-nut 24 being adapted to impinge against the washer 25 to force the latter against head 1.
90 The under surface of the washer 25 is curved to correspond to the curve 19 of the head 1. The end of block 21 that extends toward the thumb-nut 16 is preferably cut away at 21^b to enable the block 21 to be pushed well
95 around through the groove 18 toward that end of the head 1. (See Fig. 3.) By the means described when the position of stone 11, that is secured to head 1, is to be altered the thumb-nut 24 is screwed back, which
100 loosens block 21 from its groove, whereby the head 1 can be swung or moved laterally along said block to the position desired, and then the thumb-nut 24 can be screwed down firmly again to hold the parts in this position.
105

26 is a stem to be carried by any suitable support and arranged to be connected with the post 22. I have shown the parts 22 26 detachably connected, for which purpose the post 22 has a central bore 22^a to receive stem
110 26, and the material of said post is slit longitudinally in one or more places into said bore, as shown by dotted lines at 22^b in Fig. 3, so that the material of said post can be squeezed or pressed against said stem 26.
115

27 is a nut, preferably a wing-nut, threaded on the threads 23 of post 22, the post being slightly tapered outwardly, whereby as the nut 27 is screwed upon the same the stem 26 can be firmly secured to the post 22. This
120 arrangement permits ready attachment or detachment of the post 22 to and from the stem 26.

In the modifications shown in Figs. 8 to 12, inclusive, the thumb-nut 7 is on the same end
125 of the shaft or screw 4 as the thumb-piece 6, but between the latter and the head 1, so that when the jaws 10 are adjusted to the proper position the nut 7 can be screwed against said head. In said figures also the screw 12 is
130

dispensed with, and the head of the jaw 17 is located in the bore 3, as in Fig. 3; but back pressure against said jaw is resisted by means of one or more ears 17^c, carried by said jaw, that are adapted to engage teeth 1^a on the surface of head 1 at the side of the slot 3^a, that leads to bore 3. (See Fig. 10.) By preference there are two such ears 17^c and two rows of teeth 1^a—one row on each side of slot 3^a. The teeth 1^a are cut so as to project toward the stone to be held, and the arrangement is such that the jaw 17 can be readily pushed toward the jaws 10; but when the outer end of jaw 17 meets the resistance of the stone 11 it will be tilted backwardly somewhat, so as to cause its ears 17^c to engage the teeth 1^a, and thus the jaw 17 is prevented from sliding back. 28 is a pin carried by the head 1 and extending across the path of jaw 17 in bore 3 to prevent said jaw from slipping out of said bore. With the arrangement above described the stone is held between the jaws 10 17 by placing the stone in position, screwing the jaws 10 against said stone, and pushing the jaws 17 up against the stone, whereupon the ears 17^c and teeth 1^a hold the jaw 17 in such position.

I do not limit my invention to the precise details of construction shown and described, as they may be varied without departing from the spirit thereof.

Having now described my invention, what I claim is—

1. A dop comprising a head, a pair of jaws having movement of translation toward and from each other, a supplemental jaw having movement of translation independently of and at an angle to the other jaws, said jaws being adapted to hold a stone, and means for supporting said head, substantially as described.

2. A dop comprising a head, a pair of jaws movable toward and from each other, a supplemental jaw movable at an angle to the other jaws, means for moving said jaw independently of the first-mentioned jaws, said jaws being adapted to hold a stone, a stem to support said head, and means for adjusting said head on a curve across the plane of the longitudinal axis of said stem, substantially as described.

3. A dop comprising a head, a right and left threaded screw carried thereby, jaws adapted to be operated by said threads to move toward and from each other, and a supplemental jaw carried by said head adapted to coact with the first-mentioned jaws in holding a stone, and means for supporting said head, substantially as described.

4. A dop comprising a head, a right and left threaded screw carried thereby, jaws adapted to be operated by said threads to move toward and from each other, a screw carried by said head at an angle to the first-mentioned screw, a jaw adapted to be moved by said screw and to coact with the first-men-

tioned jaws, and means for supporting said head, substantially as described.

5. A dop comprising a head having two bores, one extending at an angle to the other, a right and left threaded screw located in one bore, jaws adapted to be operated by said screw to move toward and from each other, the inner ends of said jaws being located in said bore and projecting through a slot in said head, a screw located in the other bore, a jaw to be operated by said screw and having its inner end located in said bore, and means for supporting said head, substantially as described.

6. A dop comprising a head having two bores, one extending at an angle to the other, a right and left threaded screw located in one bore, jaws adapted to be operated by said screw to move toward and from each other, the inner ends of said jaws being located in said bore and projecting through a slot in said head, a screw located in the other bore, a jaw to be operated by said screw and having its inner end located in said bore, means for locking said screws in the operative position, and means for supporting said head, substantially as described.

7. A dop comprising a head having two bores, one located at an angle to the other, a right and left threaded screw located in one bore, means to prevent endwise movement of said screw, a handle or thumb-piece for said screw, a nut threaded on said screw adapted to hold the same firmly, jaws adapted to be operated by said screw to move toward and from each other, a screw located in the other bore, said screw having a thumb-piece, a nut to hold said screw firmly in a set position, a jaw adapted to be operated by said screw and to coact with the first-mentioned jaws, and means for supporting said head, substantially as described.

8. A dop comprising a head having two bores one extending at an angle to the other, a right and left threaded screw located in one bore and having a groove, a pin carried by said head to enter said groove, means for operating and for locking said screw, a pair of jaws adapted to be operated by said screw to move toward and from each other, a screw located in the other bore and having a groove, a pin carried by the head to enter said groove, means for operating and for locking said screw, a jaw adapted to be operated by said screw and to coact with the first-mentioned jaws, and means for supporting said head, substantially as described.

9. A dop comprising a head having a pair of bores, one extending at an angle to the other, a screw located in one bore, jaws adapted to be operated by said screw to move toward and from each other, a screw located in the other bore and having annular flanges forming a groove between them, which flanges have a bearing in said bore, means for operating and locking said screw, and a jaw to

be operated by said screw and to coact with the first-mentioned jaws, substantially as described.

10. In a dop the combination of a head, a plurality of jaws, two of which are adapted to move toward and from each other in the same plane, means for operating said jaws, the other jaw being adapted to move at an angle to the movement of the first-mentioned jaws, means for operating said jaw independently of the other two jaws, means for holding said jaws in a set position, and a support for said head, substantially as described.

11. In a dop the combination of a head, a plurality of jaws, and means for operating said jaws to grasp a stone between them, the stone-gripping ends of said jaws having recesses to receive the edges of the stone, substantially as described.

12. A dop comprising a head, means carried thereby for holding a stone to be polished, said head having a curved groove, a block located in said groove, said block and groove having interlocking edges, means for drawing the edges of said block against the edges of said groove to lock the block in the groove, and means for attaching said block to a stem, substantially as described.

13. A dop comprising a head, means carried thereby for holding a stone to be polished, said head having a curved groove provided with beveled or inclined edges, a block located in said groove and having correspondingsides, means for detachably securing said block to said head, and means for attaching said block to a stem, substantially as described.

14. In a dop the combination of a head, means carried thereby for holding a stone to be polished, said head having a curved groove, the opposite sides of said groove being outwardly beveled, a block located in said groove and having sides corresponding to the sides of the groove, a post extending from said block and provided with threads, and a nut adapted to work on said threads to draw the sides of the block against the sides of the groove to lock the block to the head, substantially as described.

15. In a dop the combination of a head, means carried thereby for holding a stone to be polished, said head having a curved groove, the opposite sides of said groove being outwardly beveled, a block located in said groove and having sides corresponding to the sides of the groove, a post extending from said block and provided with threads, a washer adapted to fit on over said post and to impinge against said head, and a nut to work on the threads of said post to clamp said block to said head, substantially as described.

16. In a dop the combination of a head, means carried thereby for holding a stone to be polished, said head having a curved groove, the outer surface of said head at the sides of said groove being correspondingly curved, the sides of said groove being beveled or under-

cut, a block located in said groove and having sides corresponding to the sides of the groove, said block having a post, a washer adapted to fit over said post and having its inner surface curved to correspond to the curve of the head, and a nut adapted to work on the threads on said post to clamp said block to said head, substantially as described.

17. In a dop the combination of a head, means carried thereby for holding a stone to be polished, a block adjustably connected with said head, a post extending from said block, a stem, and means for securing said stem to said post, substantially as described.

18. In a dop the combination of a head, means carried thereby for holding a stone to be polished, a block adjustably connected with said head, a post extending from said block, said post having a bore and provided with one or more slits leading to said bore, a nut adapted to compress the post around said bore, and a stem adapted to fit in said bore, whereby said post may be clamped to said stem, substantially as described.

19. A dop comprising a head, a pair of jaws, means for moving them toward and from each other, and a jaw movable at an angle to the other jaws, and complemental locking devices between the head and said jaw to prevent back movement of the jaw from its position of adjustment, substantially as described.

20. A dop comprising a head, a pair of jaws, means for moving them toward and from each other, and a jaw movable at an angle to the other jaws, teeth carried by said head, and one or more projections or lugs carried by the jaw to engage the teeth, substantially as described.

21. A dop comprising a head having bores extending at an angle to each other, a pair of jaws guided in one bore to move toward and from each other, means for operating said jaws, another jaw having a portion guided in the other bore, and complemental locking devices between the head and said jaw to prevent back movement of the jaw from its position of adjustment, substantially as described.

22. A dop comprising a head having bores extending at an angle to each other, a pair of jaws guided in one bore to move toward and from each other, means for operating said jaws, another jaw having a portion guided in the other bore, and one or more projections or lugs carried by said jaw to engage teeth carried by the head, to prevent back movement of the jaw from its position of adjustment, substantially as described.

23. A dop comprising a head having bores extending at an angle to each other, a pair of jaws guided in one bore to move toward and from each other, a right and left threaded screw in said bore to operate said jaws, another jaw having a portion guided in the other groove, and complemental locking devices be-

tween the head and said jaw to prevent back movement of the jaw from its position of adjustment, substantially as described.

24. A dop comprising a head having bores
5 extending at an angle to each other, a pair of jaws guided in one bore to move toward and from each other, a right and left threaded screw in said bore to operate said jaws, another jaw having a portion guided in the other

groove, said jaw having one or more projections or lugs to engage teeth carried by said head, substantially as described.

Signed in the city, county, and State of New York this 9th day of August, 1898.

HERBERT COOPER.

Witnesses:

JOSEPH L. LEVY,
WILLIAM JACOBSEN.