

J. W. CLARK.  
DIE HOLDER.

APPLICATION FILED SEPT. 17, 1910.

1,008,115.

Patented Nov. 7, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

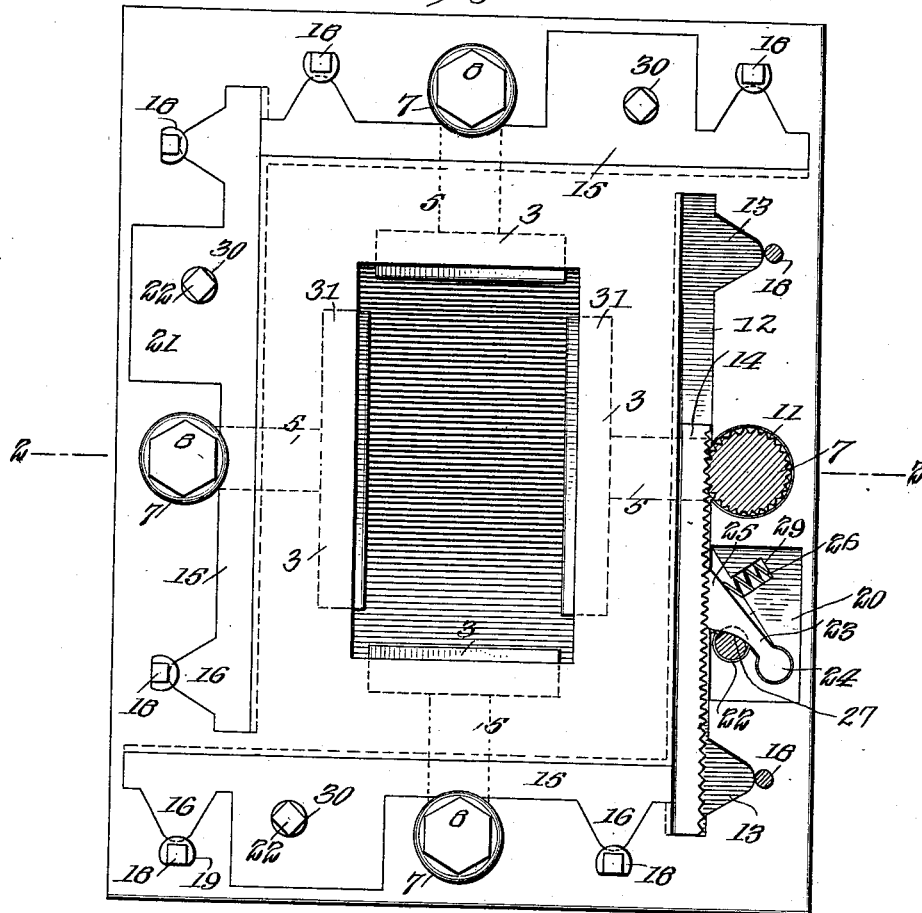


Fig. 2.

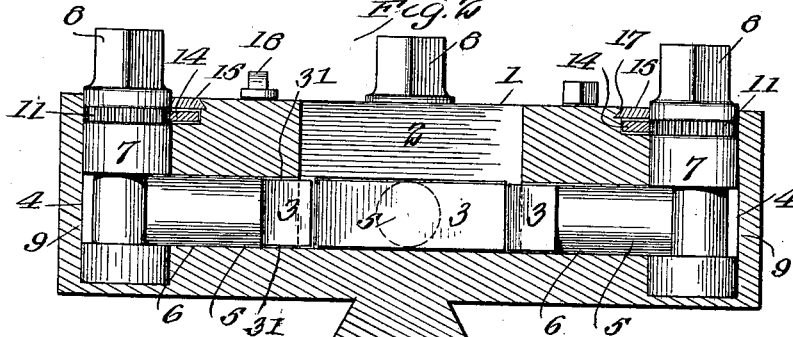
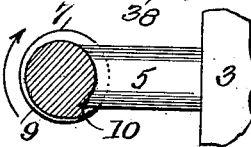


Fig. 3.



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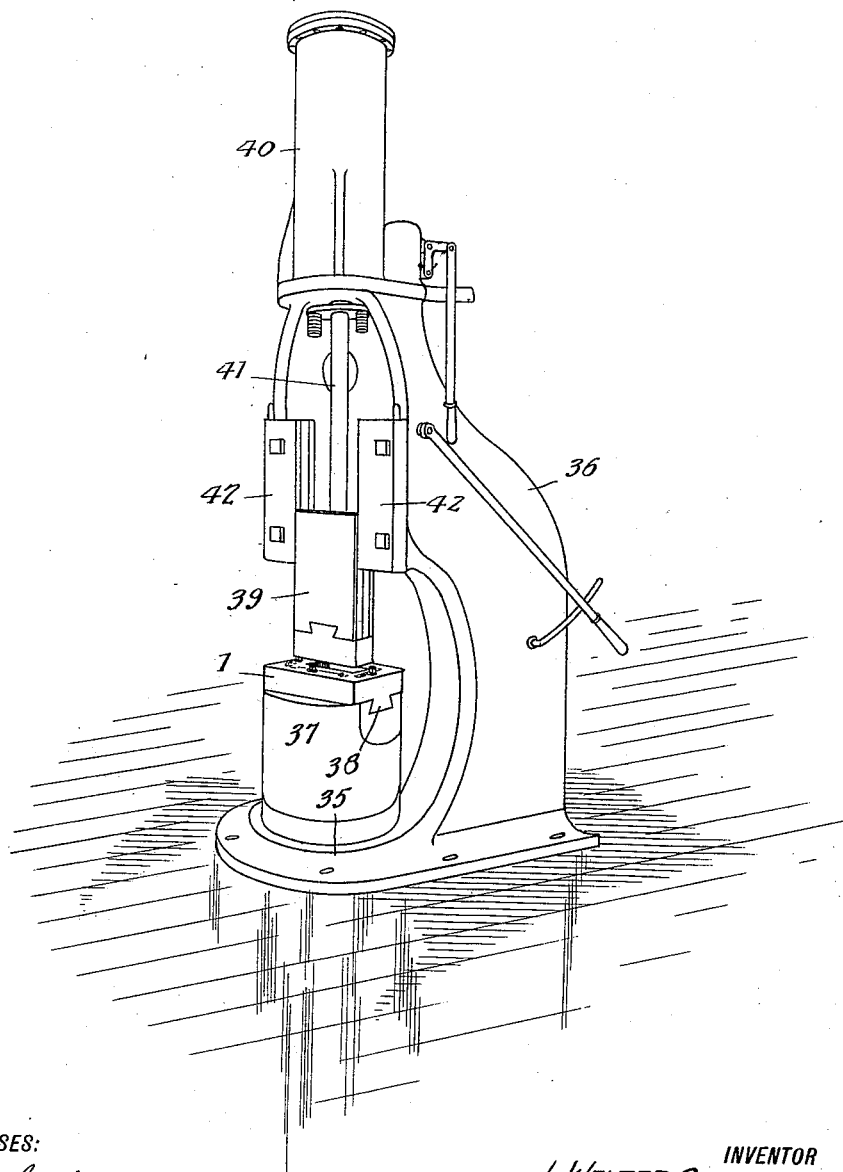
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2 SHEETS-SHEET 2.

*Fig. 4.*



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# UNITED STATES PATENT OFFICE.

JAMES WALTER CLARK, OF MUNCIE, INDIANA.

DIE-HOLDER.

1,008,115.

Specification of Letters Patent.

Patented Nov. 7, 1911.

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*To all whom it may concern:*

Be it known that I, JAMES W. CLARK, a citizen of the United States, and a resident of Muncie, in the county of Delaware and State of Indiana, have made certain new and useful Improvements in Die-Holders, of which the following is a specification.

My invention is an improvement in die holders, and consists in certain novel constructions, and combinations of parts, hereinafter described and claimed.

The object of the invention is to provide a simple but powerful device of the character specified, for clamping a die, so that it will be held positively against movement in any direction, and wherein the holding means may be firmly locked in clamping position, without possibility of accidental release.

Referring to the drawings forming a part hereof, Figure 1 is a plan view of the improvement, Fig. 2 is a section on the line 2—2 of Fig. 1. Fig. 3 is a transverse section, and Fig. 4 is a perspective view of a portion of a drop hammer provided with the improved die holder.

In the embodiment of the invention shown, a block 1 is provided having a central recess 2, for receiving the die, and the said die is held in place by four followers 3, one follower at each end, and one follower at each side. Each of the followers is connected with one end of a pin 5, moving in an opening or bore 6 in the block and the outer end of each pin extends into a vertical recess 4 in the block. A stub shaft 7 is journaled in each of the recesses 4, the upper end 8 of each shaft being polygonal in cross section as shown. On a level with the pin 5, each of the shafts is annularly grooved to form a cam 9, shown more particularly in Fig. 3. The said cam at its commencement is level or flush with the periphery of the shaft, and at the inner end a shoulder 10 is formed between the said inner end and the peripheral surface of the pin.

Near the upper end of each shaft an annular series 11 of gear teeth is formed, the said series being slightly below the upper face of the block. A groove 12 is formed in the block adjacent to each shaft, the said groove extending parallel with the adjacent side or end of the block. Each of the grooves 12 is enlarged laterally and outwardly near each end at 13, and a rack bar

14 is slidable in each groove. The teeth of each bar engages with the teeth of the adjacent stub shaft, and each bar is held in place by a plate 15 arranged above the bar. The plate 15 is provided near each end with a lateral lug or extension 16, fitting the enlargement 13 of the groove 12, and the inner edge of each plate is beveled as shown at 17, and the inner edge of the groove is undercut to fit the beveled edge. Screws 18 are threaded into openings in the block near each of the extensions 16, and each screw is provided with a mutilated head 19, for engaging over the adjacent extension 16 of the plate 15 to assist the undercut edge of the groove in holding the plate in place. Each of the grooves 12 is also enlarged near one end to form a recess 20 between the enlargement 13 and the recess 4 for the shaft, and each plate 15 is provided with an extension 21 overlying and closing the recess 20, and a screw 22 is passed through the extension and engages the block to assist in holding the plate in place. A pawl 23 is pivoted at one end at 24 in each of the recesses 20, and the free end 25 of the pawl is provided with a plurality of teeth for engaging the teeth of the rack bar 14. A spring 26 forces the pawl normally into engagement with the bar, and the screw is provided with a notch 27 for receiving the pawl to permit it to engage the rack bar. The enlargements 13 and the recesses 20 are of less depth than the groove 12, and the pawl and spring are seated in depressions 28 and 29 respectively in the bottom of each recess.

The screw 22 is so arranged, that when it is turned in the position shown at the right of Fig. 1, the pawl is received in the notch, and the teeth of the pawl engage the rack bar. When, however, the screw is turned, the pawl is pushed outwardly, thus disengaging the teeth thereof from the rack bar. Each of the screws 22 is provided with a polygonal head 30, for engagement by a tool to turn the same.

The arrangement of the cams on the stub shafts is such, that when the said shafts are turned in the direction of the arrow in Fig. 3, the pins 5 are forced inwardly thus forcing the followers or clamping blocks 3 inwardly, and into close gripping relation with the die or other article in the recess 2. As the shafts rotate, the rack bars are pushed longitudinally, and the pawls slip

idly over the rack teeth, but prevent reverse movement of the said bars. When it is desired to release the die or other article, the screw 22 is turned to disengage the pawl, thus permitting the rack bar to move in the reverse direction, and releasing the stub shaft.

The block is recessed at 31 to receive each of the followers, so that when the follower is in withdrawn position, only a small portion thereof extends into the recess.

Access may be had to the rack bars and pawls, by turning the screws 18 a half turn, so that the head disengages the apex of the extension 16. The back of each rack bears against the inner face of the groove, and the pawl is inclined with respect to the rack bar so that the teeth of the bar may slip by the teeth of the pawl when the bar is moving forwardly. When the plate 15 is removed, the rack bar may be lifted out, and by turning the shaft 7 until the pin 5 is forced entirely into the slot, the stub shaft may be lifted out of the recess. The follower and pin may also be removed through the recess, so that all of the parts are accessible for cleaning or other purposes.

The engagement of the shoulder 10 with the side of the pin 5, prevents reverse rotation of the shaft beyond a certain point, that is, beyond the point necessary to entirely withdraw the follower into the recess 31.

The pawls 23 are each provided at the end remote from the teeth with a head 24 circular in cross section, which is received in a similarly shaped depression in the bottom of the recess 20, thus pivoting the pawl, but without the necessity of a pin or screw.

The improved die holder is adapted for use in any position where a die is to be held. In Fig. 4 is shown a portion of a drop hammer, comprising a base 35, and an overhanging arm 36, extending upwardly from the base. An anvil 37 is supported on the base and the said anvil is provided with a transverse recess 38, for receiving the block 1 of the die holder. The hammer 39 cooperates with the die in the holder, and the said hammer is operated by means of a piston (not shown) in the cylinder 40 of the drop hammer. The hammer is connected with the piston by means of a rod 41, and moves in guides 42, on the overhanging arm.

I claim:

1. A device of the character specified, comprising a block having a recess for receiving a die, and having a bore leading from each side of the recess at the center thereof, and perpendicular to the said side, said block having a vertical opening at the outer end of each bore, a follower at each side of the recess, a pin in each bore engaging the adjacent follower at one end, and extending

into the vertical opening at the other, a stub shaft having a polygonal head outside of the block and an annular series of gear teeth below the head, and having an annular cam groove at the end of the pin for forcing said pin inwardly, a rack bar movable longitudinally alongside each of the stub shafts and meshing with the gear teeth, a pawl engaging the rack bar for preventing reverse movement thereof, a spring pressing the pawl toward the bar, and a screw journaled in the block adjacent to each pawl and having a notch for receiving the pawl to permit the said pawl to engage the bar.

2. A device of the character specified, comprising a block having a recess for receiving a die, and having a bore leading from each side of the recess at the center thereof and perpendicular to the said side, said block having a vertical opening at the outer end of each bore, a follower at each side of the recess, a pin in each bore engaging the adjacent follower at one end, and extending into the vertical opening at the other, a stub shaft having a polygonal head outside of the block and an annular series of gear teeth below the head, and having an annular cam groove at the end of the pin for forcing said pin inwardly, a rack bar movable longitudinally alongside each of the stub shafts and meshing with the gear teeth, and releasable means for preventing reverse movement of the bar.

3. A device of the character specified, comprising a block having a recess for receiving a die, and having a bore leading from each side of the recess at the center thereof and perpendicular to the said side, said block having a vertical opening at the outer end of each bore, a follower at each side of the recess, a pin in each bore engaging the adjacent follower at one end, and extending into the vertical opening at the other, a stub shaft having a polygonal head outside of the block and an annular series of gear teeth below the head, and having an annular cam groove at the end of the pin for forcing said pin inwardly, and releasable means for preventing reverse movement of each shaft, said means engaging the teeth.

4. A device of the character specified, comprising a block having a central polygonal recess and having a bore leading from the center of each side of the recess, and having a vertical opening at the outer end of each bore, a follower at each side of the recess, a pin in each bore engaging the follower with the inner end, a shaft in each vertical opening having an annular cam groove for engagement by the pin to force the said pin inwardly, each shaft having a head for rotating the same, and releasable means for preventing reverse movement of the shaft.

5. A device of the character specified, com-

prising a support, a plurality of followers on the support for clamping the die, and movable toward and from each other, a stub shaft journaled adjacent to each follower, 5 each of the shafts having an annular cam, a pin between each follower and the adjacent shaft, the pin engaging the follower at one end and the groove at the other, each of the shafts having an annular series of teeth, a 10 rack bar engaging the series of each shaft, a pawl for preventing reverse movement of the bar, and means for releasing the pawl.

6. A device of the character specified, comprising a support, a plurality of followers 15 on the support for clamping the die, and movable toward and from each other, a stub shaft journaled adjacent to each follower, each of the shafts having an annular cam, a pin between each follower and the adjacent 20 shaft, the pin engaging the follower at one end and the groove at the other, each of the shafts having an annular series of teeth, a rack bar engaging the series of each shaft, and releasable means for preventing reverse 25 movement of the bar.

7. A device of the character specified, comprising a support, a plurality of followers on the support for clamping the die, and movable toward and from each other, a stub 30 shaft journaled adjacent to each follower, each of the shafts having an annular cam, a pin between each follower and the adjacent shaft, the pin engaging the follower at one end and the groove at the other, and releas-

able means for preventing reverse movement 35 of the shaft.

8. In a device of the character specified, a support, a clamping follower on the support, a shaft having an annular cam groove, a pin 40 between the follower and the shaft and engaging the groove at one end and the follower at the other, said shaft having an annular series of teeth, a rack bar engaging the teeth, a pawl engaging the bar for preventing reverse movement thereof, and 45 means for releasing the pawl.

9. In a device of the character specified, a support, a clamping follower on the support, a shaft having an annular cam groove, a pin 50 between the follower and the shaft and engaging the groove at one end and the follower at the other, said shaft having an annular series of teeth, a rack bar engaging the teeth, means for rotating the shaft, and 55 means for preventing reverse movement of the bar.

10. In a device of the character specified, a support, a clamping follower on the support, a shaft having an annular cam groove, a pin 60 between the follower and the shaft and engaging the groove at one end and the shaft at the other, means for rotating the shaft, and means for preventing reverse movement thereof.

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Witnesses:

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