

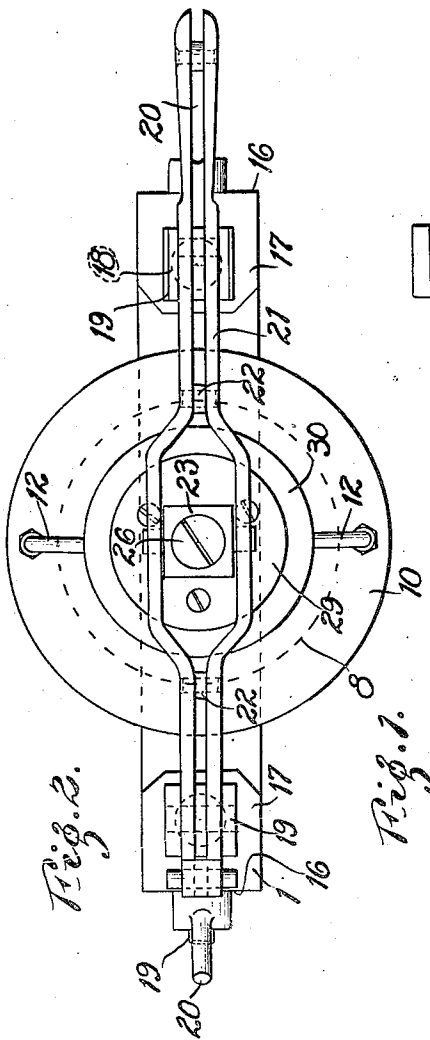
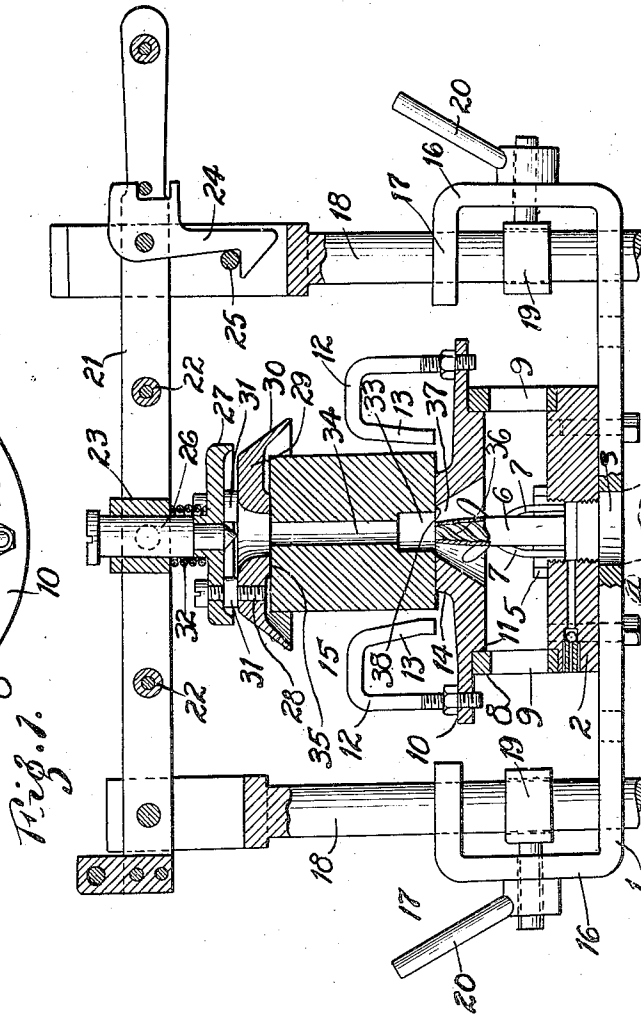
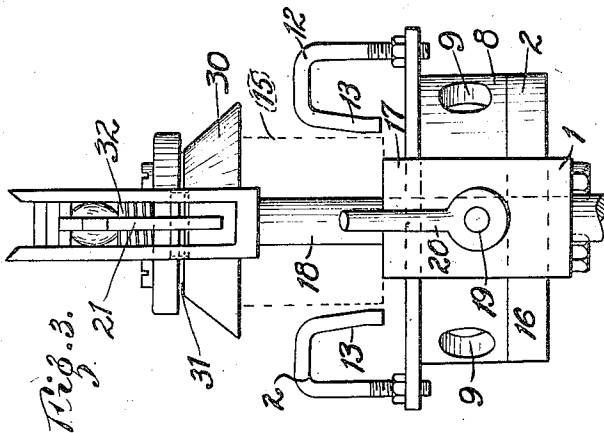
Nov. 4 , 1924.

1,513,974

E. W. EHN

QUENCHING APPARATUS

Filed Feb. 12, 1923



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Patented Nov. 4, 1924.

1,513,974

UNITED STATES PATENT OFFICE.

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QUENCHING APPARATUS.

Application filed February 12, 1923. Serial No. 618,690.

To all whom it may concern:

Be it known that I, ERIK W. EHN, a subject of the King of Sweden, and a resident of the city of Canton, in the county of Stark and State of Ohio, have invented a new and useful Improvement in Quenching Apparatus, of which the following is a specification.

My invention relates to quenching apparatus, and particularly to apparatus intended for quenching upsetting dies and the like in which it is desired to harden a comparatively small portion of the die around a recess, leaving the remainder thereof soft so as to be able to withstand shocks.

It has for its principal objects to devise a quenching apparatus in which the desired portion of the article to be quenched can be subjected to the operation of the quenching fluid and the remainder thereof be protected from the quenching fluid. The invention consists in the parts and combinations of parts hereinafter described and claimed.

In the accompanying drawing,

Fig. 1 is a vertical sectional view of a quenching apparatus embodying my invention, some parts being shown in elevation,

Fig. 2 is a top plan view thereof; and Fig. 3 is an elevation.

Mounted on a suitable base 1 is a block 2 that has an opening 3 therethrough, which opening is connected with a suitable source of quenching fluid by a pipe 4. The opening is closed by means of a threaded cap 5 from which projects a central nozzle 6 and a plurality of nozzles 7 disposed around said central nozzle. Mounted on the block 2 is a shell 8 that is provided with a plurality of openings 9. Removably mounted on said shell 8 is a plate 10. Said plate 10 is conveniently held in position by means of a projecting portion 11 that fits in the shell 8.

Secured to said plate 10 are a plurality of fingers 12 that have rebent portions 13 disposed around the central raised portion 14 of the plate on which portion rests the die 15 or other article to be quenched. The fingers serve to center or locate the die 15 on the plate 10.

The base 1 is provided with upstanding portions 16 that have horizontally extending projections 17 and through alining openings in said base and projections extend standards 18. Said standards 18 are held in posi-

tion by means of eye-bolts 19 or the like that are operated by suitable handles 20. Thus the standards may be raised or lowered. Pivotaly secured to one of the standards is a cross-arm 21 that is preferably composed of two metal members secured together at intervals by suitable pins 22, the metal members being spread apart somewhat at the middle portion of the cross-arm to receive a supporting block 23. The free end or handle of the cross-arm is provided with a latch 24 that is adapted to engage a pin 25 on the standard so that the cross-arm is held against upward movement.

Mounted in the block 23 in the cross-arm is a pin 26 to whose lower end is secured a plate or disk 27. Secured to said plate or disk 27, as by screws or bolts 28, is an annular member or plate 29 having a flaring or downwardly beveled marginal portion 30 forming a deflector or hood. Collars 31 on the screws space the plate and the deflector away from each other. Disposed between the upper plate and the block is a spring 32 that tends to keep the plate and pin in their extreme downward position.

The die 15 is placed on the holder, with its recess 33 communicating with the main nozzle. The reduced axial bore 34 of the die (which is intended to accommodate the knockout member in the finished die) extends from the end of the recess to the end of the die, where it communicates with the central opening in the deflector. The middle portion 35 of the under surface of the deflector bears against the top of the die.

After the die 15 has been placed in position, the quenching liquid is admitted. The central nozzle 6 is constructed (for instance, by being provided with spiral flutes 36) so that the quenching liquid leaving it is given a spiral or whirling motion. The liquid strikes the walls of the recess 33 of the die and passes over them quickly so that all parts of the wall of the recess are evenly hardened and the formation of air pockets is prevented.

Some of the quenching liquid drops down through the opening 37 in the locator plate and thus escapes through the holes in the cylindrical shell. Some of the liquid passes upwardly through the bore of the die, hard-

ening the walls thereof to a limited extent and passing out through the bore of the deflector and over the top thereof. The flaring hood 30 of the deflector carries the
 5 quenching liquid beyond the sides of the die so that none of it touches the die.

The auxiliary nozzles 7 are also disposed so that the quenching liquid therefrom is given a whirling or spiral motion. The
 10 bore 37 of the locator plate is upwardly tapered and the nozzles 7 are pointed upwardly and at an angle with the walls of said bore. The quenching liquid leaving the nozzles moves upwardly with a spiral
 15 or whirling motion and strikes the portion 38 of the end of the die that overhangs the opening in the plate, thus hardening a limited portion of the end of the die.

The locator plate may be removed and
 20 another plate having an opening of any desired size may be substituted therefor. The standards may be adjusted vertically, so that the device is adapted for use with dies of different sizes.

The herein described apparatus makes it possible to quench recesses in dies and other articles and leave the main body portion unhardened. It applies the quenching fluid in such a way as to avoid the formation
 30 of air pockets and it hardens all desired portions evenly. The device is capable of accommodating articles of various sizes. Obviously, numerous changes might be made without departing from the invention
 35 and I do not wish to be limited to the precise construction shown.

What I claim is:

1. A device for quenching articles having a bore which comprises a support for the
 40 article being quenched having a hole therethrough that communicates with the bore of the article, the article being disposed with a portion overlapping said hole, means for spraying the bore of the article with
 45 quenching liquid and means for spraying the portion thereof that overhangs the hole in said support with quenching liquid.

2. A device for quenching articles having a bore, which comprises a support for the
 50 article having an opening that communicates with the end of the bore of said article, means for spraying the bore with quenching liquid, means for spraying with quenching liquid that portion of the article
 55 that overhangs the opening in said support, and means for protecting the rest of the article from the quenching liquid.

3. A device for quenching articles having a bore, which comprises a support for
 60 the article having an opening that communicates with the end of the bore of said article, means for spraying the bore with quenching liquid, and means for protecting the rest of the article from the quenching
 65 liquid, said means comprising a deflector

arranged to receive quenching liquid from the bore of the article and carry it away from the article.

4. A device for quenching annular articles having a bore extending therethrough, 70 which comprises a support for the article having an opening in communication with the end of the bore of the article, a plate opposite said support for holding the article on the support, said plate having a hole 75 therethrough, and means for spraying the bore of the article with quenching liquid, said plate having a flaring portion for receiving the liquid after it has passed through the bore of the article and deflecting the 80 quenching liquid from the sides of the article.

5. A device for quenching the bore walls of articles having a bore, which comprises a support for the article having a tapering 85 hole therethrough that communicates with the bore of the article, the article being disposed with a portion overlapping said hole, a nozzle in said hole adapted to force a spiral stream of quenching liquid into the bore of 90 the article, nozzles adapted to force spiral streams of quenching liquid upwardly in said hole in said support and against the portion of the article overhanging said hole.

6. A device for quenching the walls of the 95 bore of dies and the like, which comprises a support for the die, said support having a hole therethrough, the die being disposed with its bore communicating with said opening and with a portion of the die overlapping the opening, a plate for holding the die on the support, said plate having a bore communicating with the bore of the die and having a flaring portion extending beyond 105 the sides of the die, a nozzle adapted and arranged to force quenching liquid into the bore of the die with a spiral flow, and nozzles adapted and arranged to force streams of quenching liquid upwardly in the hole of said support and with a spiral flow, to 110 harden the portion of the die overlapping said hole.

7. A device for quenching the walls of the bore of dies and the like, which comprises a base, a shell thereon, having holes there- 115 through, a support for the die mounted on said shell, said support having a hole therethrough, the die being disposed with its bore communicating with said opening and with a portion of the die overlapping the opening, 120 a plate for holding the die on the support, said plate having a bore communicating with the bore of the die and having a flaring portion extending beyond the sides of the die, a nozzle which forces quenching liquid 125 into the bore of the die with a spiral flow, and nozzles which force streams of quenching liquid upwardly in the hole of said support with a spiral flow, to harden the portion of the die overlapping said hole, the 130

quenching liquid escaping through the hole in said plate and through the holes in said shell.

5 8. A quenching apparatus comprising a base, a support for the work, vertical standard adjustably secured to said base, a cross-arm pivotally secured to one of said standards, means for latching said cross-arm to the other standard, a plate supported by said
10 cross-arm for engaging an article on said support, and means for directing quenching liquid against an article on said support.

9. A quenching apparatus comprising a base, a support for the work, arms secured to
15 said support for centering an article thereon, vertical standards adjustably secured to said base, a cross-arm pivotally secured to one of said standards, means for latching said cross-arm to the other standard, a plate

supported by said cross-arm for engaging an article on said support, and means for directing quenching liquid against an article on said support. 20

10. A quenching apparatus comprising a base, a support for the work, vertical standard adjustably secured to said base, a cross-arm pivotally secured to one of said standards, means for latching said cross-arm to the other standard, a plate supported by said cross-arm for engaging an article on
25 said support, resilient means for holding said plate against the article, and means for directing quenching liquid against an article on said support. 30

Signed at Canton, Ohio, this 8th day of Feb., 1923. 35

ERIK W. EHN.