

W. H. SMYTH.
 APPARATUS FOR SHAPING AND SHARPENING ROCK DRILL BITS.
 APPLICATION FILED FEB. 28, 1906.

1,006,306.

Patented Oct. 17, 1911.

3 SHEETS-SHEET 1.

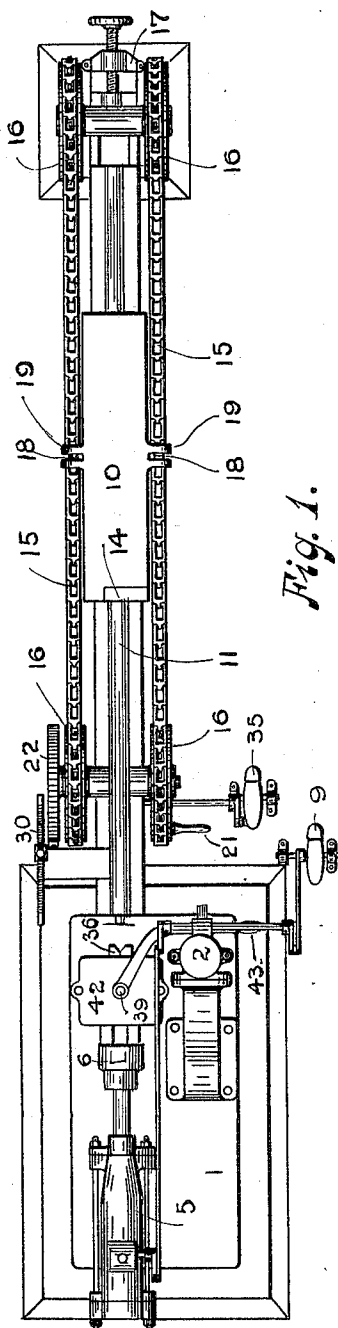


Fig. 1.

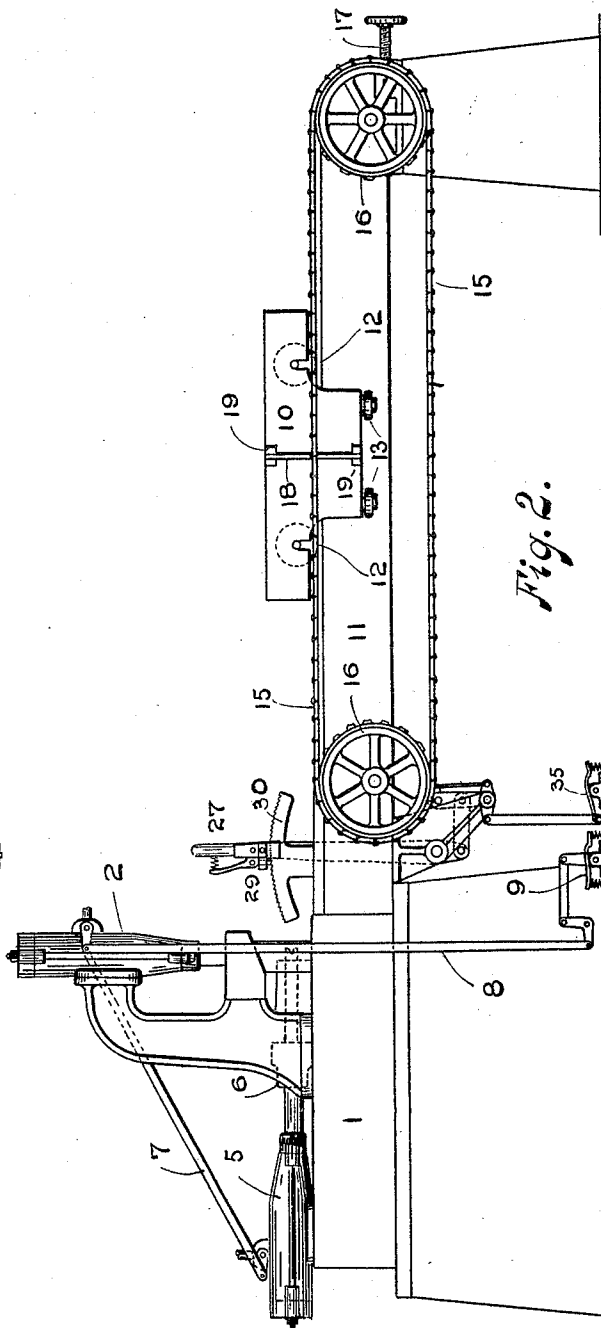


Fig. 2.

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3 SHEETS—SHEET 2.

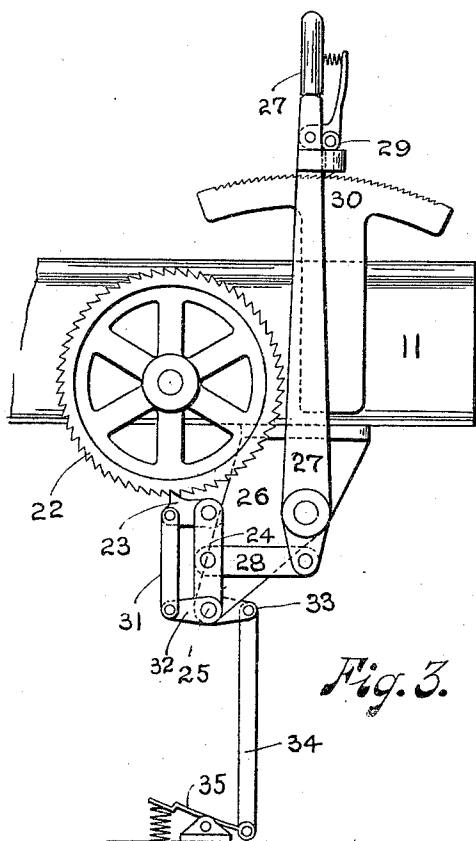


Fig. 3.

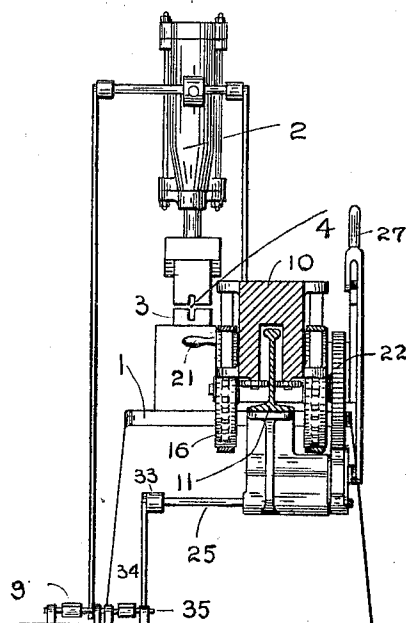


Fig. 4.

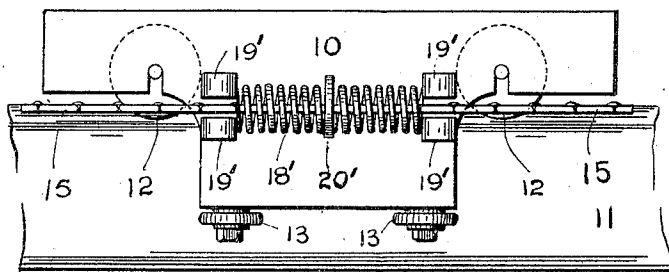


Fig. 5.

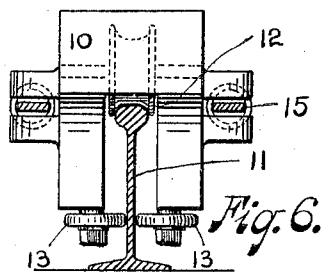


Fig. 6.

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3 SHEETS—SHEET 3.

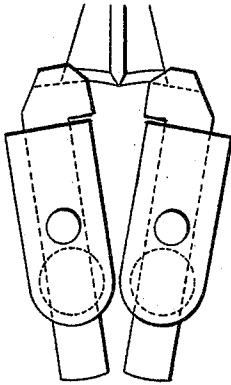


Fig. 9.

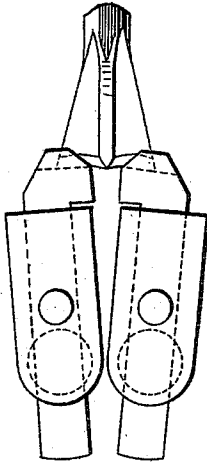


Fig. 8.

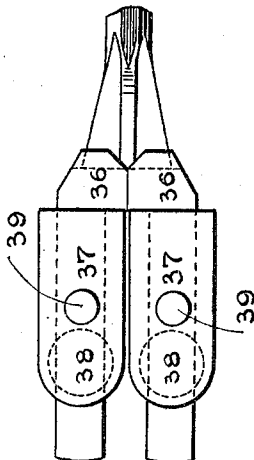


Fig. 7.

Witnesses:

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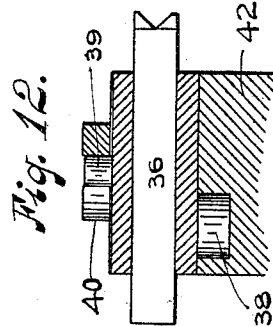


Fig. 12.

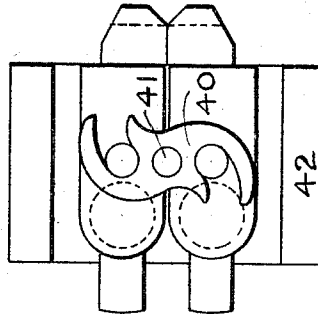


Fig. 11.

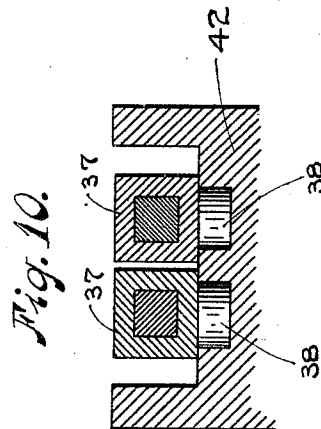


Fig. 10.

Inventor:

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR SHAPING AND SHARPENING ROCK-DRILL BITS.

1,006,306.

Specification of Letters Patent.

Patented Oct. 17, 1911.

Application filed February 26, 1906. Serial No. 303,120.

To all whom it may concern:

Be it known that I, WILLIAM H. SMYTH, citizen of the United States, residing at Berkeley, in the county of Alameda and State of California, have invented certain new and useful Improvements in Apparatus for Shaping and Sharpening Rock-Drill Bits; and I do hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to a machine for shaping and sharpening rock drills.

The object of the invention is to provide a device of this character, simpler and cheaper in construction and more effective in operation than those at present in use.

In sharpening or re-sharpening the ordinary + form or winged drill bit it is desirable to avoid distortion of the sectional form near the cutting edges, as this diminishes the efficiency of the bit. Blows directed axially parallel to the bit, during sharpening or re-sharpening tend to this form of distortion. The metal of the bit being softened by the preparatory heating is jumped and thickened by the described character of blows.

One of the objects of the present invention is to avoid in a greater degree than heretofore this jumping or thickening of the metal and to direct this natural flow of the metal where it is desired *i. e.* the outer edges of the bit wings. In other words to widen rather than thicken the wings of the bit.

These objects are accomplished by means of the devices illustrated in the accompanying drawings in which:—

Figure 1 is a plan. Fig. 2 is a side elevation. Fig. 3 is a detail of the fine adjustment feed mechanism on an enlarged scale. Fig. 4 is an end elevation, partly in section. Fig. 5 is a side view of the abutment or anvil for the drill shank, with a modified form of spring or cushion. Fig. 6 is an end view of Fig. 5. Fig. 7 is a plan view of the split dolly members, in their pivoted guides, in position with relation to the drill bit. Fig. 8 is a similar view to Fig. 7 showing the pivoted dolly members slightly separated. Fig. 9 is a similar view to 7 and 8 showing the members still more spread. Fig. 10 is a cross section of the dolly and pivoted guides. Fig. 11 is a plan of the dolly showing the operating cam. Fig. 12 is a section through one of the pivoted guides.

Referring to the drawings 1 is a base or

frame supporting two fluid actuated hammers, one of which, 2, is provided with a wing forming head, arranged in vertical position over an anvil block 3, provided with coöperating wing forming devices, shown in Fig. 4 at 4. The second hammer, 5, is placed in a horizontal position and is furnished with a suitable hammer head 6. These hammers are provided with appropriate valve moving connections 7 and 8. These connections may be carried to any suitable or convenient place within easy reach of the operator. For this purpose I have shown them as connected to a pivoted foot lever 9.

Disposed in front of the hammer 5, is a movable anvil or abutment 10, which is mounted upon and supported by an appropriate frame or track 11. This track I prefer to construct of heavy railroad iron, deck beam, or the like having a suitable rail section. It may be however constructed of any other appropriate form of beam. With such a track as I have shown I prefer to make the anvil in the form of a saddle the sides depending on each side of the beam as shown in Figs. 1 and 2, and particularly in the enlarged views Figs. 5 and 6. As will be seen in the two latter views, the anvil is provided with wheels 12 which travel upon the upper edge of the beam, and wheels 13 which travel on the web of the beam. The front end of the anvil is provided with a suitable rest or socket 14 to receive and center the shank of the drill bit.

On either side of the anvil 10 and engaging therewith is an endless chain 15—15 which passes around suitable sprocket wheels 16—16 journaled in the frame or track 11. One set of these wheels may be provided with tightening devices 17 to take up the slack of the chains as shown in Figs. 1 and 2. The tightening device is here represented as an ordinary form of adjustable bearing for the shaft of the sprocket wheels. The attachment of the chain to the anvil 10 is preferably made resilient to provide a cushion for the blows of the hammer. This is shown in Fig. 1 as a flat piece of spring steel 18 seated between lugs 19. A modified form of cushion is shown in Fig. 5 which consists of coiled springs 18'. In this form a plate 20' is attached to the chains, and lugs 19' form abutments for the springs. One of the sprocket wheels may be provided with a handle 21 to rotate it, and effect the

rapid travel of the chains 15—15. In addition to the handle 21, an independent means of moving the chains much more slowly and proportionately more powerfully, is shown in Fig. 1 and Fig. 4, but particularly in the enlarged view Fig. 3. This slow feed or fine adjustment device consists of a ratchet wheel 22 secured upon the same shaft as the forward sprocket wheels 16—16. Engaging with the ratchet wheel 22 is a pawl 23 pivotally connected to a lever 24 which is pivotally attached at 25 to a bracket 26. Pivoted in the same bracket is a lever or handle 27, the lower extension of which is connected to the lever 24 by link 29 at a point intermediate of its ends. The handle or lever 27 may be provided with a hand operated pawl 29, arranged to engage with a ratchet segment 30 suitably secured to the stationary frame. The pawl 23 is provided with a further connection consisting of a link 31 usually attached to its outer end and connecting the outer end with a rocking lever 32. The pivot 25 may consist of a shaft extending transversely across the machine as shown in Fig. 4 with a lever 33 which in turn is connected by a link 34 to a pivoted foot lever or treadle 35.

Interposed between the anvil 10 and the hammer 5, is a split-dolly or dollies 36, suitably placed to engage with the cutting end of the drill bit on the one hand, and the hammer head 6 on the other as shown in Figs. 1 and 2. The dolly 36 consists of two cooperating pivotally separable members, provided with the usual V groove in their outer ends. Each of these dolly members is slidably seated in a guide block 37. Each guide block is provided with a pivot 38 which is loosely seated in a stationary portion of the frame, or bed 1. It is also provided with a lug or projection 39. The dolly members with their guides, as thus described constitute a pivoted slidable split dolly, or a pair of pivoted slidable dollies.

Preferably located above the dollies is a rotatable cam 40 provided with suitable cam surfaces adapted to engage with each lug or projection 39 to effect its arc motion on the pivot 38. The cam 40 is provided with a shaft or pin 41 seated or journaled in frame 1, or as shown in Fig. 1 in a stationary dolly box 42. Secured upon the pin or shaft 41 is an operating handle 43.

The operation of the device is as follows:—By means of the hammer 2 the end of the drill bar is shaped and formed into the appropriate cross or winged section. It is then removed, and the shank end of the bit is placed by the operator in the rest or socket 14 its front end resting loosely in suitable centering devices. After the position of the anvil 10 has been roughly adjusted to accommodate the length of the drill by turning the handle 21, fine adjust-

ment is effected by forcing the handle 27 forward. This motion of the handle by means of the described connections effects a slight rotational movement to the ratchet 23 and consequently a slight forward motion of the anvil 10. This brings the bit into contact with the dollies 36. The hammer 5 may now be set in motion by the appropriate movement of the treadle 9 and the sharpening operation effected. The anvil 10 is of course sufficiently heavy to resist by its inertia the impact of the hammer blows, but the introduction of the cushion or spring 18 permits the employment of a lesser weight of anvil as it relieves the chain and the operator from the jar and vibration which otherwise would occur with a light anvil. By depressing the treadle 35, the pawl 23 is thrown out of engagement with the ratchet wheel 22 and consequently the anvil 10 may be moved rapidly back or forth by means of the handle 21 to roughly conform to the varying lengths of drills to be operated upon.

Described more in detail and having particular relation to Figs. 7 to 12, the operation of the pivoted slidable dollies and their effect upon the end of the drill bit are as follows:—The hammer 5 being set in motion, the drill bit is gently pressed against the dollies which by means of the handle 43 are gradually opened, the pressure on the bit being meanwhile increased until the dolly members have been spread to the limit of their pivotal motion, as indicated in Figs. 7, 8 and 9. Reverse motion is now given to the handle 43 and the dolly members gradually close again. During this closing movement the pressure on the bit is increased till the dollies are completely closed. This operation is repeated upon the other two wings and a few light taps of the closed dolly finishes the operation.

It will be seen that owing to the angularity of the dolly members their action upon the metal of the bit is to cause it to be driven outwardly with a spreading effect.

The use of the chains and the rough and fine adjustment facilitate the sharpening operation and tend to save time, as drills vary from one to many feet in length and practically no two are alike.

The chains also are better adapted to the purpose than screws and the like as they are not subject to choking and clogging by gritty dirt inseparable from the drills usually operated upon by this class of machines.

What I claim is:—

1. In an apparatus for shaping and sharpening rock drills, the combination of a hammer, an abutment and a slidably pivoted dolly.

2. In an apparatus for shaping and sharpening rock drills, the combination of a ham-

mer, an abutment, a slidable dolly pivotally mounted, and means for effecting and controlling the pivotal movement of said dolly.

3. In an apparatus for shaping and sharpening rock drills, the combination of a hammer, an abutment, two pivoted guides, a dolly comprising two members, each of said members being slidably mounted in one of said guides, and a device to engage the guides and effect the pivotal movement thereof.

4. In an apparatus for shaping and sharpening rock drills, a slidable dolly pivotally mounted.

5. In an apparatus for shaping and sharpening rock drills, a dolly slidably mounted in a pivoted guide.

6. In an apparatus for shaping and sharpening rock drills, a slidable dolly pivotally

mounted and means for effecting and controlling its pivotal movement.

7. In an apparatus for shaping and sharpening rock drills, a dolly slidably mounted in a pivoted guide and means for effecting and controlling the pivotal movement of the guide.

8. In an apparatus for shaping and sharpening rock drills, the combination of a hammer, an abutment, two pivoted guides, a dolly comprising two members, each of said members being slidably mounted in one of said guides, and a device to effect the opening and closing pivotal movement of the guides.

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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."