Aug. 29, 1944. J. A. HOPE 2,357,001

DRILL STEEL CENTRALIZER

Filed Nov. 10, 1941

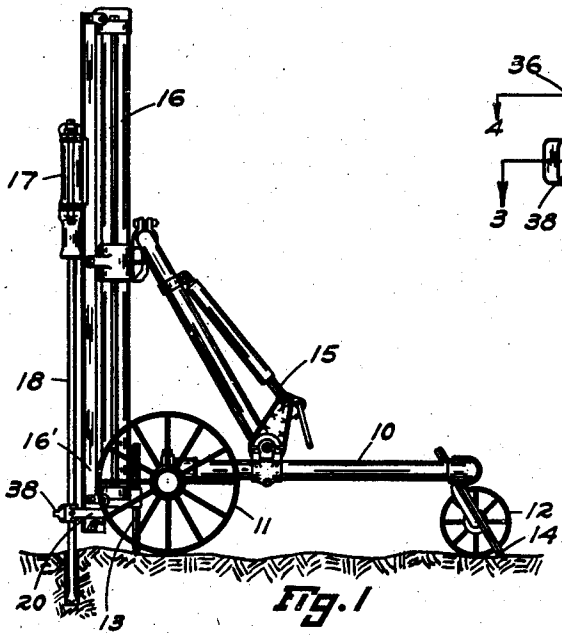


Fig. 1

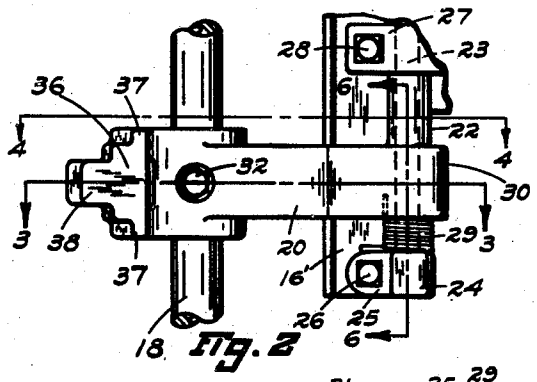


Fig. 2

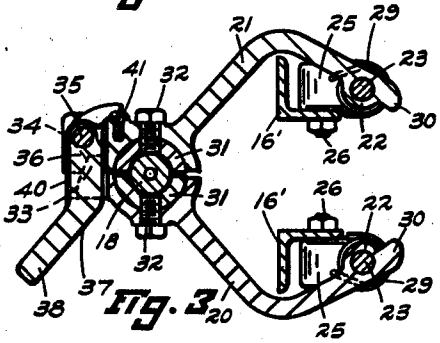


Fig. 3

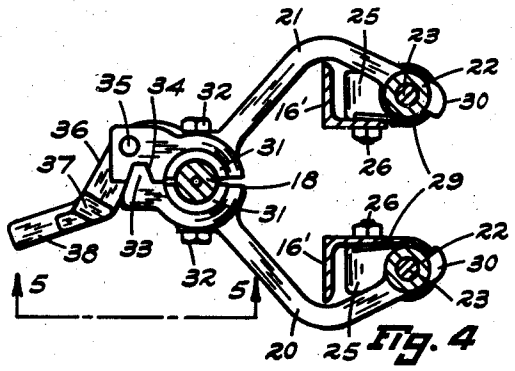


Fig. 4

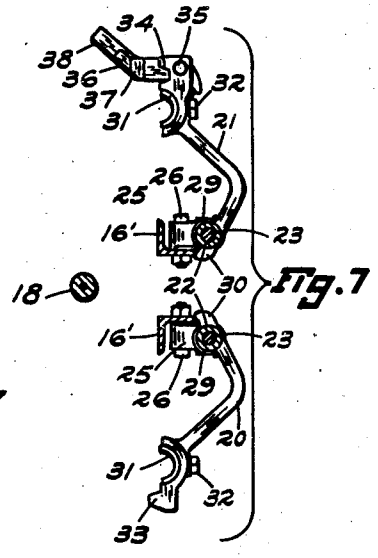


Fig. 7

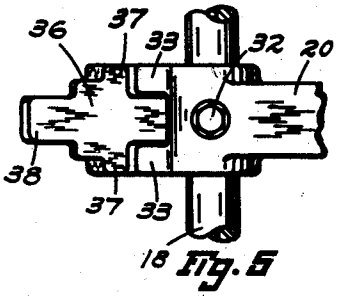


Fig. 5

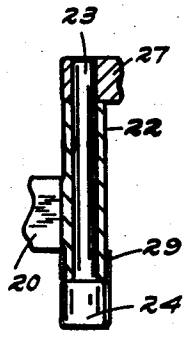


Fig. 6

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DRILL STEEL CENTRALIZER

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Application November 10, 1941, Serial No. 418,441

7 Claims. (Cl. 255—51)

This invention relates to improvements in drill steel centralizers. Where rock drills are caused to drill holes downward relatively long drill steels are often employed. Consequently when a hole is being started particularly it is necessary to provide some form of guide for the lower end of the steel, as otherwise it might be deflected out of line rather easily with the probable result that the steel would be broken inasmuch as the upper end is mounted in the drill which is rigidly carried upon a supporting framework. These auxiliary guiding means have come to be known as drill steel centralizers.

One of the objects of the present invention is the provision of a centralizer of the character stated which shall be of simple construction and yet efficient in action and which furthermore shall be susceptible of rapid manipulation in order that the drill steel may be quickly enclosed in the centralizer or as quickly freed therefrom.

Other objects and features of novelty will appear as I proceed with the description of that embodiment of the invention which, for the purposes of the present application, I have illustrated in the accompanying drawing, in which:

Fig. 1 is a side elevational view of a wheeled carriage with drill parts mounted thereon showing an application of my invention.

Fig. 2 is a fragmentary elevational view of the centralizer and its mounting with the centralizer arms closed or in operative position.

Fig. 3 is a horizontal sectional view taken substantially on the line 3—3 of Fig. 2 with the latching dog in operative position.

Fig. 4 is a horizontal sectional view taken substantially on the line 4—4 of Fig. 2, with the centralizer arms in closed position but with the latching dog withdrawn from operative position.

Fig. 5 is a fragmental elevational view looking in the direction of arrows 5—5 of Fig. 4.

Fig. 6 is a vertical sectional view taken substantially on the line 6—6 of Fig. 2, and

Fig. 7 is a reduced view corresponding to Fig. 4 but showing the centralizer arms in inoperative position.

In the drawing I have shown at 10 a carriage frame provided with ground wheels 11 and 12 by means of which the carriage may be moved from one operating position to another, and retractible prong means 13 and 14 serving to hold the carriage against accidental movement while drilling operations are being performed. On the carriage there is mounted means, generally indicated at 15, for supporting in various different positions of adjustment a boom 16 on which are carried two parallel angle irons 16' which are of approximately the same length as the boom. These angle irons carry the drilling motor 17 from which depends the drill steel 18. The centralizer is mounted upon these angle irons at the lower ends thereof. It consists primarily of two bent or curved arms 20 and 21 which at their anchored ends have integral tubular posts 22 extending at right angles to the arms proper. These tubular posts receive hinge pins 23 which at their lower ends are journaled within blind bearings 24 forming an integral part of laterally projecting ears 25 that are perforated to receive bolts 26 which extend through suitably located apertures in the angle irons 16'. The upper ends of the pins 23 project beyond the hollow posts 22 and extend into brackets 27 which are secured to the angle irons by means of bolts 28. Around each of the hollow posts 22 below its arm 20 or 21, as the case may be, there is a coil spring 29 which bears at one end against the angle iron 16' and at the other end has a hook extremity which presses against the inner side of the arm 20 or 21, tending to throw the arm to its outermost position indicated in Fig. 7. Stop means may be provided to limit the amount of this outward swing, and in the present instance such means takes the form of arm extensions 30 which are shaped to contact the rearwardly extending flanges of the angle irons 16'.

Near the free end of each of the arms 20 and 21 there is formed a substantially semi-cylindrical recess, and in these recesses are mounted drill steel guide parts, preferably semi-cylindrical bushings 31, suitable means such as machine screws 32 being provided to hold the bushings in place. When the arms are pulled together and held there the drill steel 18 may be rotated within the bushings 31 and thereby held against lateral movement in all directions.

Each of the arms 20 and 21 is bifurcated at its free extremity beyond the bushings 31, the bifurcations of arm 20 having tapered tongues 33 cooperating with complementary flared grooves 34 formed in the bifurcations of arm 21. By this means when the arms are drawn together they are so guided as to bring the bushings 31 into correct registry, overcoming any slight inaccuracies which might tend to throw them out of register, such for example as misalignment of the hinge pin bearings or warpage in the arms themselves. The bifurcated portions of arm 21 have aligned perforations to receive a pivot pin 35 which may be an integral part of a dog 36 that is arranged to swing in the space between

the bifurcations of both arms. On each side thereof the dog carries a boss **37**, see Figs. 4 and 5, which is flattened on one edge to seat beneath and frictionally engage the outer portion of a bifurcation on arm **20** when the two arms are brought together. The outer end of the dog **36** may be turned outward at an angle, as indicated at **38**, to better constitute a handle. A leaf spring **40** one end of which is fastened by screw **41** to the arm **21** and the other end of which bears upon the outer side of dog **36**, tends to move the dog into operative position as shown in Fig. 3. When the two arms are swung together the dog is cammed outwardly by engagement of the bosses **37** with the outer sides of the tapered tongues **33** until these parts clear each other, after which the spring **40** acts to snap the dog inwardly to clamping position.

The removal of a drill steel for any purpose, as for example when a dulled steel is to be replaced by one which has been sharpened, may be effected very quickly as far as the centralizer is concerned. The operator merely grasps the outer end **38** of the dog and swings the latter clockwise from the position of Fig. 3 until the bosses **37** clear the bifurcations on the arm **20**, when the two arms are free to respond to their springs **29** for movement to the position illustrated in Fig. 7.

Having thus described my invention what I claim is:

1. A drill steel centralizer comprising a pair of pivoted arms the free ends of which are adapted to swing toward and away from each other, drill steel guiding parts mounted in said free ends, a pair of tongue and groove joints in said free ends spaced apart lengthwise of the drill steel, and clamping means comprising a dog pivotally connected with one arm and arranged to swing between said tongue and groove joints, said dog having lateral projections arranged to engage the other arm for securing the arms in operative position.

2. A drill steel centralizer comprising a pair of pivoted arms the free ends of which are adapted to swing toward and away from each other, drill steel guiding parts mounted in said free ends, and latching means to hold the arms in operative position, said latching means comprising a dog pivotally mounted on one arm, abutments on the dog and on the other arm adapted to interengage when the arms are in operative position, one of said abutments having a cam surface adapted as the arms approach each other to swing the dog on its pivot until the abutments pass each other, whereby when the arms reach operative position the dog may be swung to latching position.

3. A drill steel centralizer comprising a pair of pivoted arms the free ends of which are adapted to swing toward and away from each other, drill steel guiding parts mounted in said free ends, two tapered tongue and flared groove joints in said free ends, said joints being spaced apart lengthwise of the drill steel, and clamping means for fastening the arms in operative position.

4. A drill steel centralizer comprising a pair of pivoted arms the free ends of which are adapted to swing toward and away from each other, drill steel guiding parts mounted in said free ends, two tapered tongue and flared groove joints in said free ends, said joints being spaced apart lengthwise of the drill steel, latching means for holding the arms in operative position comprising a dog pivotally carried by one arm and arranged to swing in the space between said tongue and groove joints, said latching means being arranged to yield as the arms are caused to approach each other and to snap into latching position when the arms reach operative position.

5. A drill steel centralizer comprising a pair of arms individually pivoted to a rock drill support the free ends of which are adapted to swing toward and away from each other, means for normally urging said arms away from each other, drill steel guiding means in said free ends, a tongue and groove joint in said free ends to insure the guiding parts reaching proper registration, and clamping means for fastening the arms in operative position.

6. A drill steel centralizer comprising a pair of arms individually pivoted to a rock drill support the free ends of which are adapted to swing toward and away each other, spring means carried by said pivoted ends for normally urging said arms away from each other, drill steel guiding means in said free ends, a tongue and groove joint in said free ends to insure the guiding parts reaching proper registration, and clamping means for fastening the arms in operative position.

7. In a rock drill having a pair of members for supporting the motor and drill steel, a drill steel centralizer comprising a pair of curved arms, one end of each arm carrying a pin to be connected to said members for pivotally supporting said arms in spaced relation and the free ends of which are adapted to swing toward and away from each other, spring means mounted on said pins for normally urging said arms away from each other, drill steel guiding means in said free ends, a tongue and groove joint in said free ends to insure the guiding parts reaching proper registration and clamping means for fastening the arms in operative position.

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