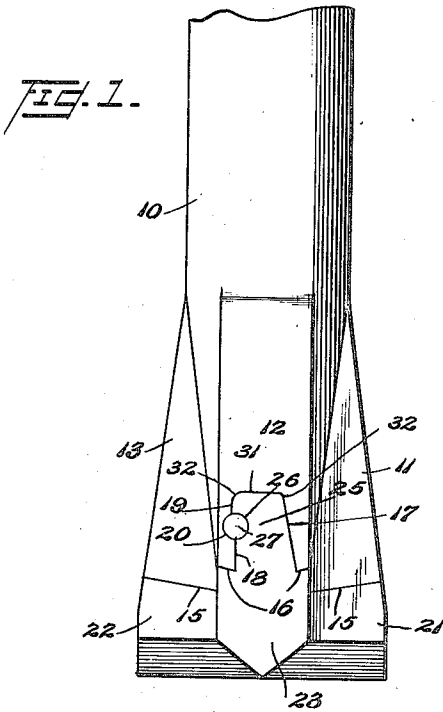
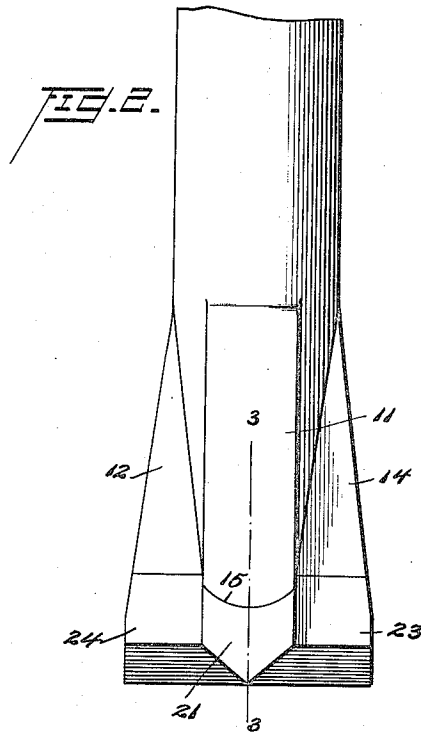
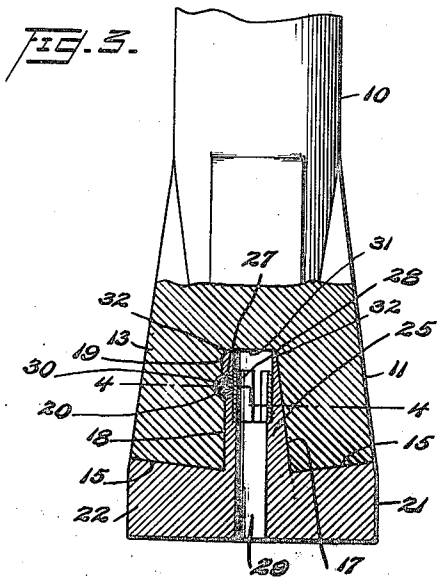
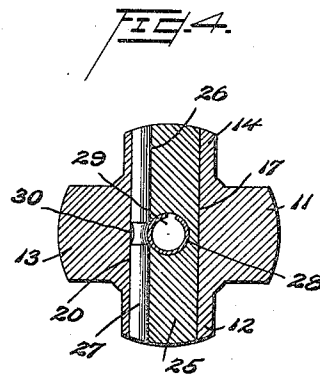


H. H. DES ROCHES.
DETACHABLE BIT FOR DRILLS.
APPLICATION FILED JUNE 5, 1920.

1,423,713.

Patented July 25, 1922.

2 SHEETS—SHEET 1.



Inventor

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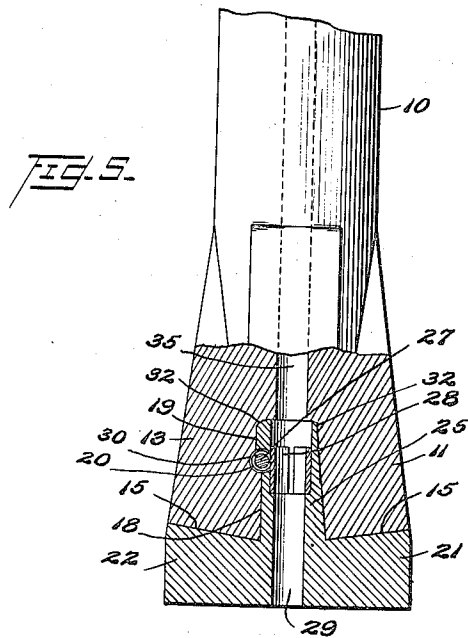
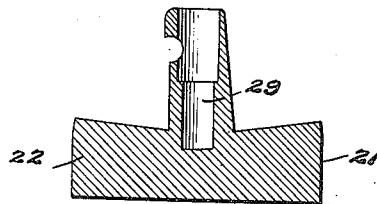


FIG. 6.

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UNITED STATES PATENT OFFICE.

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DETACHABLE BIT FOR DRILLS.

1,423,713.

Specification of Letters Patent.

Patented July 25, 1922.

Application filed June 5, 1920. Serial No. 386,690.

To all whom it may concern:

Be it known that I, HILTON HENRY DES ROCHES, a citizen of the United States, and residing at Butte, Silver Bow County, State of Montana, have invented certain new and useful Improvements in Detachable Bits for Drills, of which the following is a specification.

This invention relates to drill bits used in drilling with drill bit and hammer by hand, or by automatic power driven machines for drilling holes in hard material, such as rocks in mining, and in drilling water wells and oil wells and other similar work. In such work the drill face is quite quickly dulled and often injured or broken, and it is necessary to resharpen the drill or to substitute a new drill; therefore, the purpose of the present invention is to make a detachable point or end which may be taken off and another substituted without resharpening or substitution of a new drill. It has been found difficult to make a detachable drill point which is satisfactory in practical work, since the strains are such as to cause a looseness to develop with any ordinary or known fastening means, and that looseness causes inaccurate work and early breakage. My present invention includes a novel form of bit point detachably held in place on the shank by novel means which make it rigid and immovable on the shank in operation, and the strains of use are so distributed and the parts so formed, that it stands without injury the strains of use and does not become loose or develop lost motion. When worn or broken it may be easily removed from the hole with the drill shank to which it is attached and a new point substituted. The novel features of the invention will be apparent from the following description taken in connection with the drawings.

In the drawings:

Figure 1 is a side view of a drill bit shank having my tip thereon;

Figure 2 is a similar view taken at right angles to Figure 1;

Figure 3 is a vertical section through the tip and a part of the shank on the line 3—3 of Figure 2;

Figure 4 is a cross section on the line 4—4 of Figure 3.

Figure 5 is a vertical section similar to

Figure 3 showing a modified form of shank; and

Figure 6 is a vertical section through a modified form of drill bit.

As shown in the drawings, the drill or drill bit includes a shank or body portion 10, (Figures 1 and 3) which in the case of hand drilling is held in the hand and in the case of machine drilling is secured and held in the drilling machine by the various well known means and in the case of well drilling is secured to the drill rope or cable by various well known means. In my construction the lower or face end of the shank or body 10, (Figures 1 and 3) is made with integral radiating flanges 11, 12, 13 and 14, Figure 4, and these flanges get gradually wider from the upper portion down to the end and preferably the flange on one side is opposite a flange on the other side, as illustrated in Figure 4, where there are four flanges at right angles. The lower or exposed ends of the flanges 11 and 13 are cut on a curve which is the arc of a circle transversely from one side of each flange to the opposite and approximately parallel side of the same flange as shown at 15, Figure 2. Also the lower or exposed ends of the flanges 11 and 13 are cut, not straight across from the outer surface of one flange to the outer surface of the other flange, but are cut slightly wedge-shaped or on a slant or at an angle so that the inner or central part of each of these flanges is slightly longer than, and extends downward slightly farther than, the outer edge of the same flange as shown at 15, Figure 1, and 15, Figure 3. The flanges 12 and 14 are similarly cut on the arc of a circle 16, Figure 1, but at a slightly higher level than the point where the flanges 11 and 13 are cut, thus making the flanges 12 and 14 somewhat shorter. A groove is cut within the lateral margins of the flanges 12 and 14 at their lower ends entirely across the shank from the outer edge of one flange to the outer edge of the opposite flange, and this groove has on one side a substantially straight wall 17, (Figures 1 and 3) which slats or inclines slightly inward from the mouth or opening of the groove to the upper end or bottom of the groove; and on the other side the wall of this groove consists of three parts,—first,

a substantially straight portion 18 (Figures 1 and 3) which is nearest the mouth or entrance to the groove, and which part of the wall extends the full length of the groove from one side of the drill to the opposite side; next, a substantially semicircular portion 20 (Figures 1 and 3) which also extends the full length of the groove; and lastly, near the upper end or bottom of the groove, another substantially straight portion 19 (Figures 1 and 3) which also extends the full length of the groove and is farther removed from the opposite wall of the groove than is the first described part of this wall 18 (Figures 1 and 3). The upper end or bottom 31 (Figures 1 and 3) of this groove is substantially straight or flat and joins the above described walls in a slight curve which may be the arc of a large circle 32 (Figures 1 and 3). The shank 10 (Figures 1 and 3) in cases where it is not desired to have air or water pass through the drill may be made of a solid piece of metal as shown in Figure 3; and in cases where it is desired to have air or water pass through the drill this shank may have extending through its central portion longitudinally from end to end a hole or bore 35 suitable for the passage of such air or water as shown in Figure 5.

My detachable bit point embodies four radiating flanges at right angles and is so formed on its upper surface as to match and fit across at all points the lower exposed surface of the shank or body which has just been described, and the lower or cutting edges of the bit point are preferably made tapered or V-shape as shown, so as to properly do the work of cutting. The flanges 21 and 22 on the bit point have their upper surfaces cut on an angle in one direction, viz on the length of the flange and on a transverse curve in the arc of a circle in the other direction, both corresponding to and fitting the curved or rounded and slanting ends 15 of the flanges 11 and 13 on the shank. The flanges 23 and 24 on the bit point are cut away along the margins for a short distance inwardly on an arc of a circle and at a higher level than that on which the flanges 21 and 22 are cut, so as to fit the lower end of the flanges 12 and 14 of the shank. A central vertical flange 25, however, is left extending entirely across the device through the center from the outer edge of flange 23 to the outer edge of flange 24, (Figures 1 and 2). This flange has considerable height and has on one side a substantially straight wall slanting, as it extends upward from its base, slightly inward to match the corresponding wall 17 (Figures 1 and 3) of the socket or groove; and has on the other side a substantially straight portion to match the portion 18 (Figures 1 and 3) of the socket and another substantially

straight portion to match the portion 19 (Figures 1 and 3) of the socket and between these two straight portions there is a semicircular groove to come opposite and match the semicircular groove 20 in the socket, and the top of this flange is substantially flat to match the upper end or bottom of the socket, the lines of junction between walls of this flange and its top being rounded to match the rounded portions 32 (Figures 1 and 3) of the socket. A pin 27 (Figures 1 and 3) may be inserted in the opening formed by the two semicircular matching grooves and may extend from one side of the drill bit to the other, thus furnishing a lock for holding the drill bit point in position on the end of the shank against any longitudinal movement. It will further be observed that by reason of the tongue and groove connection between the bit point and the shank, and by reason of the fact that these tongue and groove connections extend across the ends of the parts at right angles, the bit point is held against any rotary or lateral movement on the shank. The semicircular grooves 20 and 26 are furthermore so related, particularly in connection with the curved portion of the flange 25, as to cause a clamping action when the pin 27 is inserted in the opening formed by those grooves. A curved cylindrical metal spring section 28 (Figures 3 and 4) which may be on the arc of a circle in section, is placed within a vertical opening or hole 29, (Figure 4) extending upwardly from the bottom of the bit point centrally and the spring projects slightly out into the semicircular groove 26 (Figure 4). The pin 27, (Figure 4) may have on it at its center, a slightly depressed portion 30 (Figure 4) which by contact with the spring 28 (Figure 4) will lock it in position while the spring still exerts tension on it. It will be observed that the form and shape of the parts at their meeting surfaces with the drill bit point will make close contact with the shank at all points transversely, thus furnishing the full surface of contact for the drilling operation, and preventing undue strains from being localized and at the same time the arrangement is such that the locking means clamps the parts together so that there is no lost motion and none will be produced in ordinary wear.

In cases where it is not desired to have air or water pass through the drill the hole 29 need not go to or through the working face of the bit point but may be made to extend as far as desired to hold the spring 28 as shown in Figure 6 while in cases where it is desired to have air or water pass through the drill this hole will extend clear through the bit point in such a way that when the drill point is placed in position on the drill shank 10 (Figures 1 and 3) the hole or bore in the drill point will be oppo-

site to and continuous with the hole or bore of the shank as shown in Figure 5 to allow the passage of air or water.

It will be observed that the drill bit or point may be removed from the shank or body by driving out the pin 27 (Figure 4) and then lowering the drill bit from the shank until the upper edge of groove 26 (Figure 1) comes in contact with the lower edge of groove 20 (Figure 1) and then removing the bit or drill point by sliding it to either side. In like manner a new drill point may be placed in position by sliding the flange 25 (Figure 1) into the shank socket from either side, then raising the drill point into position and inserting the pin.

Having thus described the invention what is claimed as new and desired to be secured by Letters Patent is:

20 1. A drill or drill bit comprising a body or shank and a detachable cutting portion or bit fitting closely the end of said shank across the transverse end surface, the meeting surfaces being so formed as to have
25 tongue and groove engagement at different transverse angles preventing relative lateral or rotary movement and causing a tight fit under end pressure and releasable locking means for preventing longitudinal movement of the bit away from the shank.

30 2. A drill or drill bit comprising a body or shank and a detachable cutting portion or bit fitting closely the end of said shank entirely across the transverse end surface, the meeting surfaces being so formed as to have
35 tongue and groove engagement at different transverse angles preventing relative lateral or rotary movement and causing a tight fit under end pressure and releasable locking means for preventing longitudinal movement of the bit away from the shank.

40 3. A drill or drill bit comprising a body or shank and a detachable cutting portion or bit fitting closely the end of said shank entirely across the transverse end surface, the meeting surfaces being so formed as to have tongue and groove engagement at different transverse angles preventing relative lateral or rotary movement and causing a
45 tight fit under end pressure and releasable locking means for preventing longitudinal movement of the bit away from the shank so formed as to exert a constant force pressing the bit tightly against the end of the shank.

50 4. A drill or drill bit comprising a body or shank and a detachable cutting portion or bit point fitting closely entirely across the end of said shank, the end of said shank being provided with a transverse groove
55 extending upwardly a material distance across the center, one wall being substantially vertical, inclining slightly inward as it extends upward; the other wall being substantially vertical having a semicircular groove
60 therein running transversely about midway

between the top and bottom of this wall, the floor or upper end of this groove being substantially flat and joining the walls with slightly rounded edges or arcs of circles, a transverse flange on said bit point of such shape as to fit said transverse groove and having a semicircular groove in position to match the semicircular groove in said shank portion, and a locking pin so fitting the opening produced by said semicircular
75 grooves as to clamp and lock the parts together.

5. A drill or drill bit comprising a body or shank and a detachable cutting portion or bit point fitting closely entirely across
80 the end of said shank, the end of said shank being provided with a transverse groove extending upwardly a material distance across the center, one wall being substantially vertical inclining slightly inward as
85 it extends upward; the other wall being substantially vertical having a semicircular groove therein running transversely about midway between the top and bottom of this wall, the floor or upper wall of this groove being substantially flat and joining the walls or sides with slightly rounded edges or curves, arcs of circles, a transverse flange on said bit point of such shape as to fit said transverse groove and having a semicircular groove in position to match the semicircular groove in said shank portion, a metal spring in said bit point extending transversely of and projecting into said semicircular grooves, and a locking pin so fitting the opening produced by said semicircular grooves as to clamp and lock the parts together and compress and lock with said metal spring.

6. A drill or drill bit comprising a body or shank having radial flanges disposed at right angles to each other and gradually increasing in width from their upper ends towards the end of the shank, a bit point formed of a single piece of metal comprising radial flanges corresponding to and at one end fitting tightly against the ends of the shank flanges and at the other end adapted for cutting, tongue and groove connections between said shank and bit point at right angles to each other adapted to cause a tight fit when pressed together preventing lost motion and relative rotary or lateral movement, and detachable means for locking the two parts together under tension against relative longitudinal movement.

7. A drill or drill bit comprising a body or shank having radial flanges disposed at right angles to each other and gradually increasing in width from their upper ends towards the end of the shank, a bit point formed of a single piece of metal comprising radial flanges corresponding to and at one end fitting tightly against the ends of

the shank flanges and at the other end adapted for cutting, tongue and groove connections between said shank and bit point on right angle lines parallel to said flanges, one of the flanges and its corresponding groove being of considerably greater depth than the other and extending within the lateral margins of the flanges from the end of and to the end of the opposite one and across the center, the said flange and groove of greater depth having meeting surfaces on one side so formed as to cause a wedging action as the parts are forced together and detachable means on the opposite surfaces for locking them together against separation.

8. A drill or drill bit comprising a body or shank having radial flanges disposed at right angles to each other and gradually increasing in width from their upper ends towards the end of the shank, a bit point formed of a single piece of metal comprising radial flanges corresponding to and at one end fitting tightly against the ends of the shank flanges and at the other end adapted for cutting, tongue and groove connections between said shank and bit point on right angle lines parallel to said flanges, one of the flanges and its corresponding groove being of considerably greater depth than the other and extending within the lateral margins of the flanges from the end of and to the end of the opposite one and across the center, the said flange and groove of greater depth having meeting surfaces on one side so formed as to cause a wedging action as the parts are forced together and having in their opposite surfaces similar semicircular grooves so positioned that when brought into register the wedging action will hold the parts rigidly clamped together against lost motion, and a locking pin entering the opening formed by said semicircular grooves and extending along it and locking the parts together in clamped position.

9. A drill or drill bit comprising a body or shank having radial flanges disposed at right angles to each other and gradually increasing in width from their upper ends towards the end of the shank, a bit point formed of a single piece of metal comprising radial flanges corresponding to and at one end fitting tightly against the ends of the shank flanges and at the other end adapted for cutting, tongue and groove connections between said shank and bit point on right angle lines parallel to said flanges, one of the flanges and its corresponding groove being of considerably greater depth than the other and extending within the lateral margins of the flanges from the outer end of one flange and to the outer end of the opposite one and across the center, the said flange and groove of greater depth

having meeting surfaces on one side so formed as to cause a wedging action as the parts are forced together and having in their opposite surfaces similar semicircular grooves so positioned that when brought into register the wedging action will hold the parts rigidly clamped together against lost motion, and a locking pin entering the opening formed by said semicircular grooves and extending along it and locking the parts together in clamped position, and a central longitudinally curved, circular or tubular metal spring in said bit point projecting laterally partly into said semicircular groove and cooperating with said pin to lock the parts under tension.

10. A drill or drill bit comprising a body or shank having radial flanges disposed at right angles to each other and gradually increasing in width from their upper ends towards the end of the shank, a bit point formed of a single piece of metal comprising radial flanges corresponding to and fitting the ends of the shank flanges with joints semicircular in cross-section and slanting towards the center, the joints between one pair of opposite flanges being on a different transverse line from those of other flanges to form locking shoulders and slanting slightly downward from without inwardly, the meeting ends of the shank and point on one pair of opposite flanges being provided with a central tongue and groove connection of less width than the flanges and of considerable depth extending from the end of one flange across the center to the end of the opposite flange, and spring pressed locking pin connection between the shank and point along said tongue and groove from one end to the other.

11. A drill or drill bit comprising a body or shank and a detachable cutting portion or bit fitting closely the end of said shank entirely across the transverse end surface, the meeting surfaces being so formed as to have tongue and groove engagement at different transverse angles preventing relative lateral or rotary movement the meeting surfaces of said drill bit and shank between one pair of opposing flanges being on a different transverse line from those of the other pair of opposing flanges to form locking shoulders and slanting slightly downward from without inwardly, and the meeting surfaces of those opposing flanges which have the tongue and groove connection being higher or closer in on the shank than the meeting surfaces of the first opposing pair of flanges and causing a tight fit under end pressure and releasable locking means for preventing longitudinal movement of the bit away from the shank so formed as to exert a constant force pressing the bit tightly against the end of the shank.

12. A drill or drill bit comprising a body

or shank and a detachable cutting portion or bit fitting closely the end of said shank entirely across the transverse end surface, the said shank and bit portion having central registering passageways therethrough for 5 air or fluid, the meeting surfaces being so formed as to have tongue and groove engagement at different transverse angles preventing relative lateral or rotary movement and causing a tight fit under end pressure 10 and releasable locking means for preventing longitudinal movement of the bit away from the shank.

In testimony whereof I affix my signature.

HILTON HENRY DES ROCHES.