J. F. MURRAY.

DRILL.

APPLICATION FILED NOV. 22, 1920.

1,401,353. Patented Dec. 27, 1921.

FIG. 1.

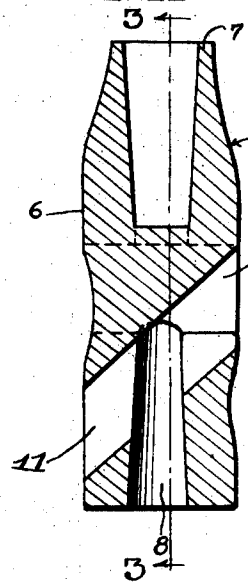


FIG. 2.

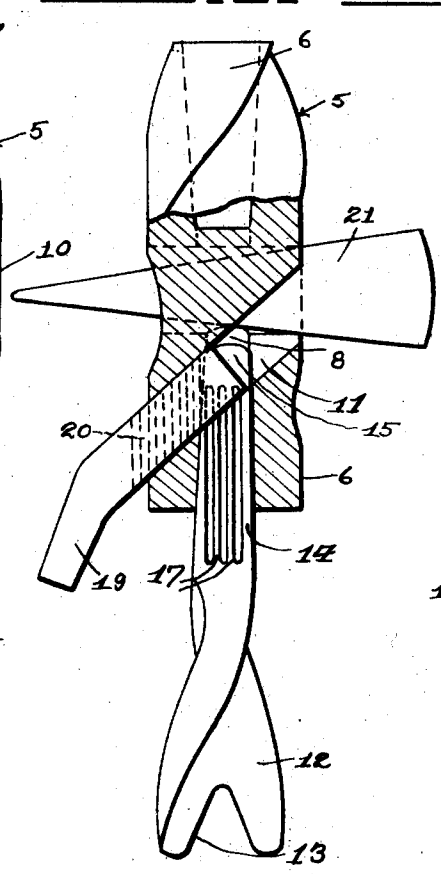


FIG. 3.

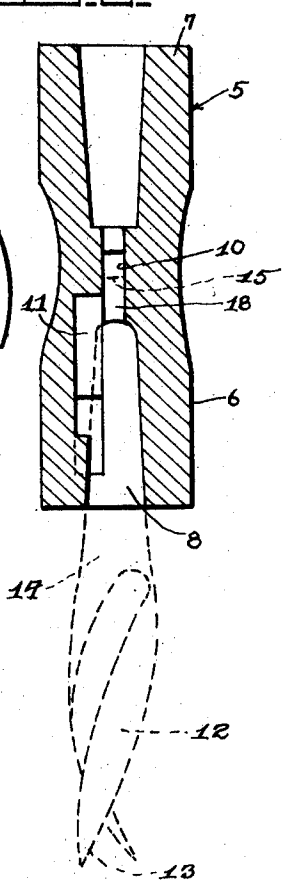


FIG. 5.

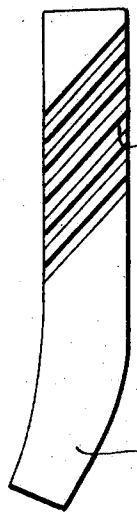
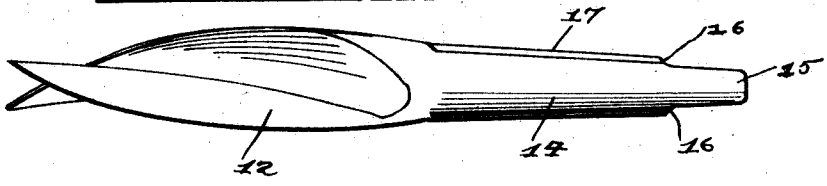


FIG. 4.



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DRILL.

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Application filed November 22, 1920. Serial No. 425,859.

To all whom it may concern:

Be it known that JOSEPH F. MURRAY, a citizen of the United States, residing at Herrin, in the county of Williamson and State of Illinois, has invented certain new and useful Improvements in Drills, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to drills and particularly to drills including bit heads.

An object of the invention is to provide a drill of this character including a bit head wherein a pilot bit and a reaming bit may be securely attached to the bit head without the use of fastening means such as set screws and the like.

Another object is to provide a bit head of this character wherein the pilot bit is frictionally engaged with the reaming bit and wherein the pilot bit is provided with means for binding the same within the bit head and in engagement with the reaming bit.

Another object is to provide a bit head of this character having a pilot bit in one end and a reaming bit extending substantially laterally of the pilot bit and through the bit head, said bit head having a slot into which the end of the pilot bit extends whereby means may be applied to the end of the pilot bit to disengage the same from the bit head.

A still further object of the invention is to provide a bit head of this character including a bore in one end and a slot extending laterally of the inner end of the bore and the bit head, and a slot extending obliquely of the bit head and intersecting the first mentioned slot and the bore, said first mentioned slot being adapted to receive a drift pin by means of which the pilot bit is forced from the bit head and disengaged from the reaming bit disposed in the second mentioned opening.

With these and other objects in view, the invention consists in the improved construction and arrangement of parts to be hereinafter more particularly described, fully claimed and illustrated in the accompanying drawings, in which:—

Figure 1 is a longitudinal sectional view of a bit head constructed in accordance with an embodiment of the invention,

Fig. 2 is a longitudinal sectional view illustrating the manner of unfastening the bits from the bit head, the bits being disposed in a position to be readily removed from the bit head,

Fig. 3 is a longitudinal sectional view taken on the line 3—3 of Fig. 1, the pilot bit being shown in dotted lines,

Fig. 4 is a side elevation of the pilot bit, and

Fig. 5 is a plan view of the reaming bit.

Referring to the drawings, 5 designates a bit head having the usual bit ribs 6. This bit head may be of any length desired and relatively large in diameter. A substantially rectangular and tapering bore is provided in the end 7 of the bit head, while a bore 8 is provided in the central portion of the end 9. The inner end of the bore 8, terminates at the intermediate portion of the bit head and is tapered longitudinally thereof. A slot 10 is provided in the bit head 5, at its intermediate portion, said slot extending laterally of the bit and through the inner end of the bore 8, the purpose of which will be hereinafter described.

A slot 11 is provided in the head 5, said slot extending obliquely of the bit head and intersecting one side portion of the bore 8 and the inner end thereof, and the inner side wall of the slot 10. By this novel construction, the bore 8 and slots 10 and 11 communicate with each other so that any implement or object inserted in the slots or bore, will project slightly through the communicating openings in the slots or bore.

In order to pilot the bit head in the drilling operation, a novel form of pilot bit 12 is provided, said bit being of the twist type and having its cutting edge bifurcated as at 13. The shank 14 of the bit 12 is tapered toward one end, said end having a reduced extension 15 projecting therefrom, the shoulders 16 formed by the extension gradually inclining from the shank and merging with the extension. These shoulders form guides for the bit 12 when the same is being applied to the bit head. One side portion of the shank 14, is provided with a plurality of longitudinal teeth or ribs 17 which terminate at the adjacent shoulder 16 of the extension. When the pilot bit 12 is inserted in the bit head, the extension 15 is guided by the end portion of the bore 8 and by the shoulders 16 into the slot 10. The outer wall 18 of the slot 10 is disposed adjacent the inter-

mediate portion or axial center of the bore 8. In view of this when the bit 12 is inserted in the bore 8, one side of the extension 7 will engage the wall 18 of the slot and cause the shank 14 to bind within the bore 8 at the same time slightly forcing it toward the slot 11. By this novel arrangement the bit is firmly secured within the bit head, and it is of course obvious that as pressure is applied to the bit head, the bit will be more firmly forced into the same.

In connection with the bit head and pilot bit a novel form of reaming bit 19 is used, said bit having a plurality of obliquely disposed ribs or teeth 20 on one side thereof, the end of the bit being curved or extended toward the side including the teeth 20.

In use, the reaming bit 19 is first disposed in the obliquely extending slot 11 with the teeth 20 thereof projecting through the communicating opening of the slot with the bore 8. The pilot bit 12 is then inserted in the bore 8, with the ribs or teeth 17 engaging the channels formed between the teeth 20 of the reaming bit 19. The pilot bit is then forced firmly into the bit head as above described, so as to bind the same therein and also cause the bit to frictionally engage the reaming bit 19 and maintain the same in position through the coöperation of the teeth 17 and 20. When in this position, it is of course obvious that the extension 15 projects a considerable distance inwardly of the slot 10, and as the slot is relatively long, there is no danger of the extension coming in contact with the end wall of the slot and limiting the frictional engagement of the pilot bit with the bit head.

When it is desired to unfasten or loosen the reaming bit and pilot bit to permit removal of the same from the bit head 5, a novel form of drift pin 21 is used, said pin including tapering sides, which merge at one end thereof. This pin is inserted in the slot 10 until one of the sides comes in contact with the end of the extension 15. Pressure is then applied to the pin, by striking a blow on the broad end thereof. This causes one side of the pin to engage one end wall of the slot 10 while the other side engages and forces the extension 15 outwardly of the slot 10 and into the bore 8, whereupon the pilot bit 12 may be readily removed from bore 8. The reaming bit 19 is also removed from the slot 11, after the frictional engagement of the pilot bit 12 with the bit head has been relieved.

From the foregoing it will be readily seen that this invention provides a novel form of drill or bit head wherein the various bits may be readily applied and removed without the use of fastening means such as set screws, bolts or the like, the fastening means for the bits being provided by the tapering form of the shank 14 of the pilot bit and the novel arrangement of the slots 10 and 11. In this way, the strain of the drilling operation is not centered on any weak structure such as set screw but the entire bit is so positioned that it receives the burden of the drilling operation so that any desired amount of pressure may be applied without danger of loosening the bit in the bit head. On the other hand, when it is desired to remove the bit all that is necessary is to insert the drift pin 21 into the slot 11, whereupon the bits may be readily removed with a saving of time and energy.

What is claimed is:—

1. A device of the character described comprising a body member having a bore in one end thereof, and slots extending laterally of the body member, said slots intersecting each other and the bore, a reaming bit disposed in one of said slots, and a pilot bit disposed in said bore and frictionally engaging the reaming bit.

2. A device of the character described comprising a body member having a bore in one end, the inner end portion of said bore terminating adjacent the intermediate portion of the body member, said body member having a pair of laterally extending slots, said slots intersecting each other and the bore, a pilot bit having a reduced extension on one end, and adapted to be disposed in the bore, and a reaming bit disposed in one of said slots and engaged with the side portion of the pilot bit, the extension of the pilot bit being adapted to extend into the remaining slot of said pair to cause frictional engagement of the pilot bit with the body member and the reaming bit.

3. A bit head of the character described comprising a body member having a bore in its end, said bore terminating at the intermediate portion of the body member, said body member also having an obliquely extending slot, one side of the slot intersecting one side portion of the bore, and a laterally extending slot intersecting the inner end of the bore and one side wall of the obliquely extending slot, a pilot bit having a tapered shank, a reduced extension on the end of said shank, said shank being disposed in the bore and the extension in the laterally extending slot, and a reaming bit disposed in the obliquely extending slot and urged into binding engagement with the body member through the medium of the shank of the pilot bit.

4. A drill of the character described embodying a body member, a pilot bit and a reaming bit carried by the body member, said bits being arranged to engage each other and coacting to prevent disengagement of each other from the body member.

5. A drill of the character described, embodying a body member having intersecting bores, a pilot bit disposed in one of said

bores, said bits having longitudinally extending teeth on the shank thereof, and a reaming bit disposed in another of said bores, said reaming bit having a series of teeth extending obliquely of the shank of the bit whereby the movement of the reaming bit after the bits are positioned in the body member, will cause binding engagement of the teeth of one bit with the teeth of the opposite bit.

In testimony whereof I hereunto affix my signature.

JOE F. MURRAY.