This invention relates broadly to rock drills of the percussion type and more particularly to improvements in drill steel retainers.

One of the objects of this invention is to produce a releasable drill steel or tool retainer which is simple in design, economic in manufacture, and susceptible of ready manipulation.

Another object is to provide a tool retainer wherein the cutting tool may be introduced without the necessity of the position of the retainer, thus facilitating the operation of the mechanism.

Other objects and advantages more or less auxiliary to the foregoing and the manner in which the various objects are attained reside in the specific construction and arrangement of the elements peculiar to this structure, as will become apparent from a more complete examination of this specification, in the claims of which there are assembled certain specific combinations of parts and specific constructions indicative of the scope and spirit of the invention.

In the drawing which illustrates a preferred embodiment of the invention:

Fig. 1 is an elevational view partly in section of the front end of a rock drill illustrating the drill steel retainer in an operative or closed position.

Fig. 2 is a cross sectional view taken in a plane indicated by line 2—2 in Fig. 3 illustrating the retainer in an inoperative position.

Fig. 3 is an elevational view partly in section taken at right angle to Fig. 1.

Fig. 4 is an end view of the retainer positioned as illustrated in Fig. 2.

Fig. 5 is an end view of the retainer positioned as illustrated in Fig. 1.

Referring to the drawing, in which like symbols designate corresponding parts throughout the several views, there is shown a front head 10 which forms the lower portion of a rock drill. The front head is manufactured with a hemispherical bore 11 within which there is slidably mounted the shank 12 of a cutting tool 13, upon which the working piston of the rock drill is capable of delivering its blow. The length of the shank 12 is limited by a collar 14 formed integral therewith and slidably mounted within a cylindrical counterbore 15, located in axial alignment with the bore 11 and opening from the forward end of the front head 10.

The external walls of the counterbore 15 are formed with two diametrically opposed flats 16 terminated toward the front by projecting ribs 17 disposed in angular relation with the center axis of the machine. Unitizing the flats 16, there is provided through the wall of the housing 10 an aperture 18. The portion of each of the flats 16 circumventing the aperture 18 are counterbored as at 19. Through the wall of the housing 10, diametrically opposed to the aperture 18 there is provided a slot 20 forming two side walls 21 and 22. The slot 20 is of sufficient depth to open within the counterbore 15, the purpose of which will be explained later.

Rotatably mounted within the aperture 18, there is a shaft 23 formed intermediate its ends with an annular recess 24 within which there is engaged a pin 25 which is slidably disposed within a bore 26, and maintained in engagement with the shaft 23 by a tension of a compression spring 27, which is interposed between the bottom of the bore 26 and pin 25. Within the recess 24, the shaft 23 is provided with a transversely disposed orifice 28.

Pivotally mounted upon the ends of the shaft 23, there is a tool retainer 29 comprising a yoke formed with a throat 30, having arms 31 and 32 extending therefrom in straddled relation with the housing 10. These arms are conveniently spaced from each other to allow the passage thereof over the diametrically opposed flats 16. Toward their outer end, the arms 31 and 32 are formed with an enlarged head 33 rotatably mounted within the counterbore 19. The heads 33 are provided with a transversely disposed orifice 34 capable to receive the ends of the shaft 23. Extending upwardly from one of the heads 33, there is an integral handle 35 maintained in spaced relation with the housing 10, by the engagement of the arms 31 and 32 with the ribs 17, and the engagement of yoke throat 30 with the lower wall 22 of the slot 20. Disposed on the periphery of the heads 33, there is provided two stops 36 and 37 united by an inclined wall 38. Adjacent the heads 33, the housing 10 is provided with two restricted bores 39 opening into the counterbores 19 ahead of the center axis of the shaft 23. Within these restricted bores, there is slidably mounted a plunger 40 maintained in engagement with the stops 36 or 37 by the tension of a compression spring 41. The ends of the plungers 40 protruding from the bores 39 are formed with a bevel 42, capable of engagement with the inclined wall 38.

When the retainer is positioned as illustrated in Fig. 1, the yoke throat 30 protrudes suffi-
ciently within the counterbore 15 to prevent the passage of the collar 14. The retainer 29 is held in that position by the engagement of the spring pressed plunger 40 with the stop 36, maintaining the yoke throat 30 in engagement with the housing 10 or wall 22 of the slot 20, and the arms 31 and 32 in engagement with the ribs 17. It will be seen that the complete wall of the retainer 29 is held in engagement with the front housing 10, thus the accidental blow transmitted by the collar 14 to the yoke throat 30 are checked by the housing 10 and distributed thereto on more than one half of its periphery, preventing thereby the breakage of the retainer or of the housing and affording an efficient tool arresting device.

If it is desired to withdraw the tool 13 from the housing 10, the handle 35 may be rotated downwardly or in a counter-clockwise direction to position the retainer as illustrated in Fig. 2. In this position, the yoke throat 30 is out of the counterbore 15, and consequently out of possible engagement with the collar 14, allowing thereby the removal of the cutting tool 13. The retainer 29 is maintained in the opened position by the engagement of the spring pressed plungers 40 or more specifically by the engagement of its bevel 42 with the inclined wall 38 of the retainer.

When the retainer 29 is located in a closed position as illustrated in Fig. 1, the cutting tool may be introduced in the machine without manipulating the tool retainer. The collar 14 will engage the lower wall of the yoke throat 30 and will raise the same sufficiently to allow the passage of the collar and consequently permit the introduction of the cutting tool. The yoke throat 30 will not be raised sufficiently to permit the engagement of the plungers 40 with the inclined walls 38, thus the retainer after the passage of the collar, will snap back to a closed position by the tension of the spring pressed plungers 30 on the stops 46.

The shaft 23 may be removed from the aperture 18 by inserting a nail or any similar member through the orifice 28 and move the plunger 25 rearwardly against the compression of the spring 27. When the plunger is out of engagement with the recess 24, the shaft 23 may be removed from the aperture 18.

Although the foregoing description is necessarily a detailed character, in order to completely set forth the invention, it is to be understood that the specific terminology is not intended to be restrictive or confining and it is to be further understood that various rearrangements of parts and modification of structural detail may be resorted to without departing from the scope or spirit of the invention as herein claimed.

I claim:

1. A tool retainer comprising a housing formed with a bore adapted to slidably receive the shank of a cutting tool, a collar having integral with said housing engaged with said collar within said housing opening within said housing, a yoke retainer pivoting and engaging with said collar, pivotally secured to pivotally move said yoke retainer opening with said collar, and a handle integral with said retainer by which said closed

end portion may be moved into or out of engagement with said collar, said handle and retainer falling short of the outer ends of said housing irrespective of the position of said portion with respect to said collar.

2. A tool retainer comprising a housing having a collared cutting tool slidably mounted therein, a yoke retainer formed with a throat moveable into or out of engagement with the collar of said cutting tool to prevent or permit the removal of the latter from said housing, said yoke retainer having arms extending therefrom pivotally secured to said housing, and means integral with said housing engageable with said throat and said arms for limiting the pivot movement of said yoke retainer toward the front end of said housing when said throat is in engageable position with the collar of said tool.

3. A tool retainer comprising a housing formed with a bore adapted to slidably receive the shank of a cutting tool, a collar having integral with said housing engaged with said collar within said housing opening within said housing, a collar integral with said tool formed therein at a convenient distance from the end of said shank, a yoke retainer having arms extending from the closed end thereof to the exterior of said housing for pivotable engagement therewith, and a transversally disposed slot within the wall of said housing opening within said counterbore through which the closed end of said yoke is pivotally movable into or out of said counterbore to prevent or permit the removal of said tool from said housing.

4. A tool retainer comprising a housing formed with a bore adapted to slidably receive the shank of a cutting tool, a collar having integral with said housing engaged with said collar within said housing opening within said housing, a yoke retainer formed with a throat having arms extending therefrom to the exterior of said housing for pivotable engagement therewith, and a substantially diametrically opposed to said slot, a handle integral with said housing opening within said counterbore, said yoke retainer pivotally moveable within said housing, said yoke retainer comprising a tool having arms extending therefrom pivotally mounted at the ends of said shaft, a slot within said housing opening within said counterbore, said yoke being pivotally movable through said slot into or out of engagement position with said collar to prevent or permit the removal of said cutting tool from said housing, a recess intermediate the ends of said shaft, a slot within said housing opening within said counterbore, said yoke being pivotally movable through said slot into or out of engagement position with said collar to prevent or permit the removal of said cutting tool from said housing, a recess intermediate the ends of said shaft, a slot and arm pivotally secured to said housing.
to the exterior of said housing, and supporting surfaces integral with said housing disposed on
more than one half of the periphery thereof, said surfaces being engageable with the closed
end and arms of said yoke to limit the pivotal movement of the latter in a clockwise direction.
7. A tool retainer comprising a housing having a collared tool slidably mounted therein, a
shaft within said housing, a retaining member pivotally mounted on said shaft into or out of
engageable position with the collar of said tool,
said retaining member having its pivotal move-
ment into engaging position with the collar of
said tool limited by its engagement with a por-
tion of said housing, said shaft being located
above the engaging portion of said retaining
member with said housing, said retaining mem-
ber falling short of the outer ends of said hous-
ing irrespective of the position of the former with
respect to the collar of said tool.

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