To all whom it may concern:

Be it known that I, Joseph Tuck, a citizen of the United States, residing at Hawks Nest, in the county of Fayette and State of West Virginia, have invented certain new and useful Improvements in Cutter-Heads for Mining-Machines, of which the following is a specification.

My invention relates to cutter heads used on mining machines for channeling the breast of coal or other mineral preparatory to blasting it, and has for its object the provision of an improved construction of cutter head whereby the channeling operation may be most effectually accomplished and furthermore, provided with means whereby the slack or dust and small particles cut out by the cutter head may be withdrawn from the cutting.

To this end, my invention consists of a conical-shaped tool having a plurality of spiral spines thereon spaced apart to form grooves and so arranged that during the operation of the cutter head said spines and grooves operate with the base of the cutting to carry the slack out on to the floor of the mine.

My invention furthermore, provides means for securing removable cutting tools in the cutter head consisting of screw pins or bolts that engage the shanks of said tools and hold them in place.

My invention will be described in detail hereinafter and illustrated in the accompanying drawings, in which,

Figure 1 is a side view in elevation of a cutter head constructed in accordance with my invention; Fig. 2, a cross sectional view on the line 2—2 of Fig. 1; Fig. 3, a cross section on the line 3—3 of Fig. 1; Fig. 4, a view of the removable bit; and Fig. 5, a fragmental plan view of the bit.

My invention relates to machines particularly adapted to mining coal. In this art, as at present practiced it is the custom to cut out at the base of the breast of mineral and channel along the lower portion of the vein and then drill holes adjacent to the upper portion of the vein into which an explosive is placed and fired, breaking down the coal where weakened by the channel. At first, this channel was cut by hand with picks, hand drills, etc., but as this was an expensive and tedious operation, machines have been provided for doing the work.

My invention relates to the cutter heads used on these machines and the novelty therein resides in the provision of a plurality of spiral spines on the surface of the cutter head separated by grooves, said spines being arranged at such an angle to the axis of the cutter head that the slack or small particles removed by the cutter head during operation are most effectually withdrawn from the channel cut thereby and deposited on the floor of the mine where it can be easily removed.

In the drawings, similar reference characters will be used to designate corresponding parts throughout the several views.

My improved cutter head comprises a body portion 1 that is slightly tapering or conical from its butt toward the point. Said body portion 1 is formed with a plurality of spines 2 that are formed integral with or rigidly secured to the body portion 1 and arranged spirally on said body portion and extend from end to end thereof. Said spines are arranged on the body portion at such an angle to the axis of the cutter head that when the cutter head is in operation, the spines by engaging the lower portion of the channel cut by the cutter head, will effectually serve to remove the slack from the cutting. The spines 2 are, as shown in the drawings, spaced apart from one another to form the grooves 3 in which the slack is removed when removed from the cutting.

The spines 2 are provided with a plurality of radial sockets 4 in each of which is mounted a tool 5 having its outer edge formed with a beveled cutting point 6. The tools 5 are held in position in the sockets 4 by means of screws, or bolts 7 engaging the shanks of said tools 5, said screws being inserted into position through the walls of sockets 8. By this construction, it will be apparent that the tools 5 may be quickly removed and replaced when necessary for sharpening or renewal as the pins 7 are capable of being removed and replaced quickly. The tools 5 are arranged in staggered relation to the longitudinal axis of the body portion 1 and a plurality of the tools 5 are arranged in substantially the same horizontal plane with relation to the longitudinal axis of the body portion 1, at different points on the cutter head.

The outer terminal of the cutter head 1 is provided with a threaded socket 9, and 10 indicates a bit having a shank 11 that is threaded to engage said socket 9. The
threads on said shank 11 and in the socket 9 are "left hand" threads to prevent the bit from being unscrewed from engagement with the cutter head while in operation.

5 The cutter head 10 is as shown conoidal in shape and provided with a plurality of spines 12 corresponding in number to the number of spines 2 on the body of the cutter head, said spines 12 having outwardly extending wings 13 that serve in conjunction with the cutter tools 5 to remove the mineral while the cutter head is in operation.

Having thus described the invention what is claimed is:

15 In a cutter head for mining machines, the combination with a tapered longitudinal body portion, of a plurality of spiral spines, rectangular in cross section, spaced apart and forming grooves, a plurality of cutting tools centrally and removably mounted on each of said spines in staggered relation to the longitudinal axis of said body portion, and a plurality of said tools disposed in substantially the same horizontal plane with relation to the longitudinal axis of the body portion, at different points upon the cutter head, and a removably mounted bit at the outer end of said cutter head having a corresponding number of spiral spines forming grooves and continuous with and engaging the spines of the body portion aforesaid and having wings extending outwardly therefrom.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH TUCK.

Witnesses:

THOMAS HENRY WOOD,
ZEPHAMAREE CAMPBELL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."