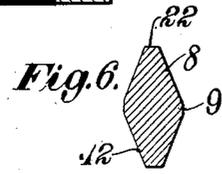
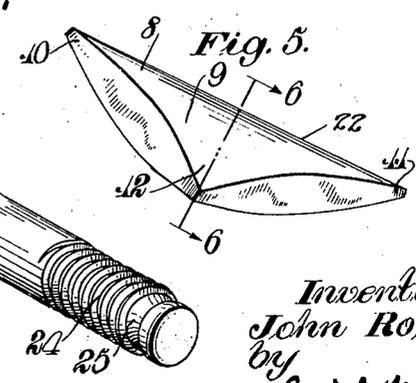
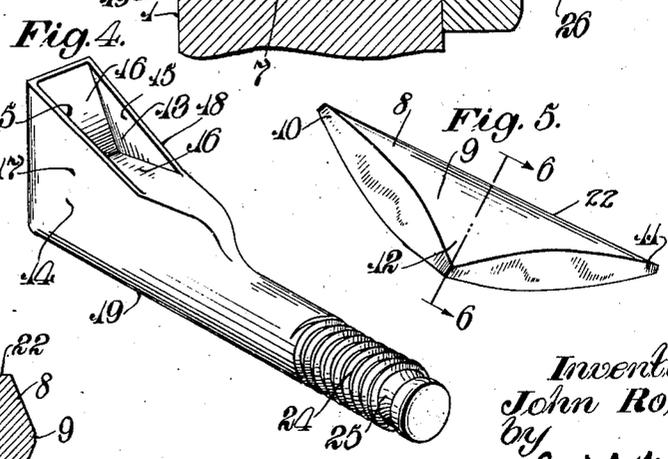
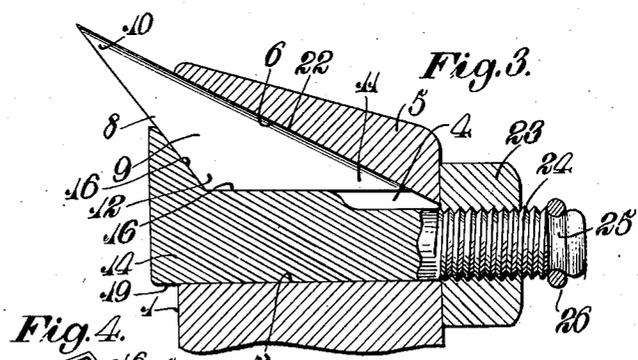
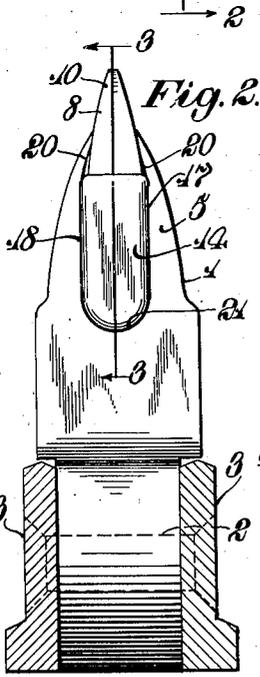
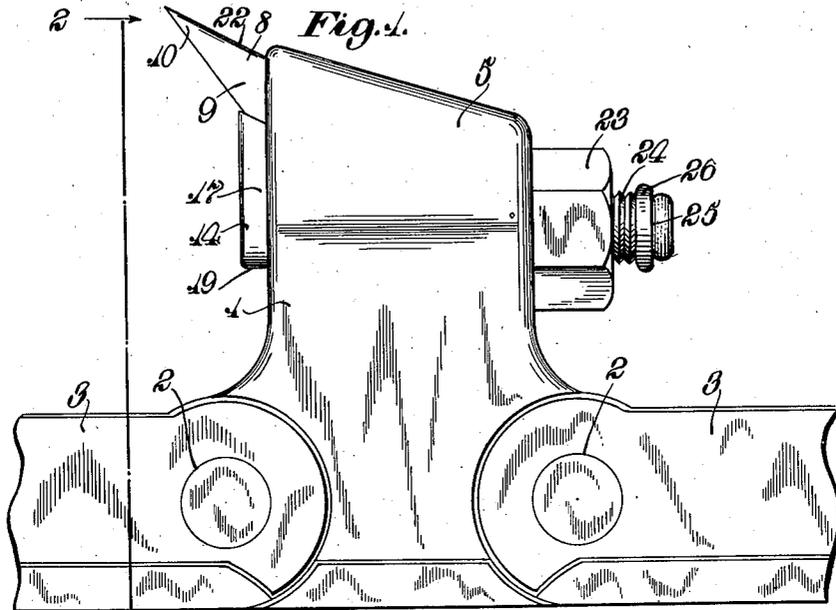


Nov. 5, 1935.

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CUTTER CHAIN

2,020,215

Filed Jan. 9, 1933



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UNITED STATES PATENT OFFICE

2,020,215

CUTTER CHAIN

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Application January 9, 1933, Serial No. 650,867

37 Claims. (Cl. 262—33)

This invention relates to cutter chains, and more particularly to improvements in cutter chains particularly adapted for mining purposes.

An object of this invention is to provide an improved cutter chain. Another object is to provide an improved cutter chain having embodied therein improved means for holding the cutter bit in place within the bit block. Still another object is to provide an improved cutter bit. A further object is to provide an improved cutter bit having a pair of cutting ends and having associated therewith improved holding means therefor for holding the same in position within the cutter chain. These and other objects and advantages of the invention will, however, hereinafter more fully appear.

In the accompanying drawing there is shown for purposes of illustration one form which the invention may assume in practice.

In this drawing,—

Fig. 1 is a side elevational view of the illustrative embodiment of the improved cutter chain.

Fig. 2 is a transverse sectional view taken substantially on line 2—2 of Fig. 1.

Fig. 3 is a central longitudinal sectional view taken substantially on line 3—3 of Fig. 2.

Fig. 4 is a perspective view of the bit clamp.

Fig. 5 is a perspective view of the cutter bit.

Fig. 6 is a transverse sectional view taken on line 6—6 of Fig. 5.

In this illustrative construction there is shown a cutter chain comprising a bit holder 1 having pivotally connected thereto at 2 usual straps 3.

Formed in the bit holder 1 is a socket 4 of generally ovate cross section and extending from the forward surface of the bit block 5 to the rear surface thereof, as shown in Fig. 3, and having an upwardly and outwardly inclined upper surface 6 and a longitudinally extending inner surface 7, said surfaces 6 and 7 converging toward the rear face of the bit block. In this illustrative construction, the cutter bit is generally indicated at 8 and comprises a body 9 of triangular formation having opposed cutting ends or points 10 and 11 at the sides of the triangle, and the top 12 of the triangle is adapted for reception within a correspondingly shaped socket or seat 13 formed on the outer side of a clamping element 14.

The bit may be advantageously formed by cutting from approximately diamond-shaped or other symmetrically shaped bar stock, forming the cutting faces by cutting the stock diagonally, and making successive diagonal cuts complete

a bit by turning over the stock between each cut and the next one. By selecting bar stock which is of symmetrical form with respect to axes at right angles to each other, the faces of each bit will necessarily be the same, if the angle of the cutter to the bar be maintained the same. After being formed the bit will be hardened and tempered as may be desired, and will require no individual sharpening if suitable bar stock be employed. The finished bit has its points 10 and 11 at its opposite ends and at the extremities of elongated faces which are alike in outline, are in planes forming a dihedral angle whose edge includes the opposite lateral extremity of the bit, and are individually symmetrical as to both major and minor axial lines.

The clamping element 14, as above mentioned, is formed to fit the body of the bit, the socket 13 having relatively inclined side surfaces 15 and bottom surfaces 16 for engaging the corresponding surfaces on the bit body. The clamping element 14 is in the form of a wedge having inwardly converging sides 17 and 18 and is provided with a bottom surface 19 for engagement with the inner surface 7 of the bit block socket. The sides of the socket 4 converge upwardly at 20, 20 toward the inclined surface 6 and are shaped to fit the inclined sides of the bit, while the inner surface 7 of the socket is rounded at 21 to fit the correspondingly rounded inner side of the clamping element. The longer side 22 of the bit engages the inclined surface 6 of the socket 4, and when the clamping wedge 14 is tightened, that is, drawn rearwardly by a nut 23 engaging the rearward threaded end 24 of the element 14, the surface 22 of the bit is clamped against the surface 6 of the socket, the element 14 holding the bit in place within the bit block with a wedging action. When the cutting end or point 10 of the bit becomes dull, the clamping element 14 may be readily loosened by loosening the nut 23, and the bit turned end for end; and the bit is then again clamped in position within the bit block, the cutting surface 11 at that time being active. The threaded end 24 of the clamping element is grooved at 25 for the reception of a locking ring 26, this locking ring preventing complete release of the nut 23 from the threaded end 24 of the clamping element, and as a result, inadvertent separation of the parts is prevented.

As a result of this invention, it will be noted that an improved cutter chain is provided having a cutter bit of improved design, and improved holding means engageable with the bit for holding

the bit in place within the bit block. It will further be noted that an improved cutter bit is provided which may be readily and cheaply formed and having associated therewith holding means of an extremely simple character. These and other uses and advantages of the improved cutter chain will be clearly apparent to those skilled in the art.

While there is in this application specifically described one form which the invention may assume in practice, it will be understood that this form of the same is shown for purposes of illustration and that the invention may be modified and embodied in various other forms without departing from its spirit or the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. A cutter bit holding element comprising a wedge-shaped clamp having a socket obtuse-angled in side elevation and having similarly shaped bottom surfaces for receiving an intermediate portion of the body of a cutter bit.
2. A cutter bit holding element comprising a wedge-shaped clamp having a socket obtuse-angled in side elevation for receiving an intermediate portion of the body of a cutter bit, the socket having relatively inclined forward and rearward surfaces engageable with mutually corresponding surfaces on the bit.
3. A cutter bit holding element comprising a body in the form of a wedge having a socket for the reception of a central portion of the body of a cutter bit, said socket having forward and rearward walls respectively making like angles with the direction of the back of the bit held therein.
4. A cutter bit holding element comprising a body in the form of a wedge having a socket for the reception of a cutter bit and having an integral threaded end portion adapted for engagement with tightening means, said socket angular in form as viewed from the side of said element.
5. A cutter chain comprising a bit block having a socket for receiving a cutter bit of triangular formation, and a clamping element receivable in said socket and having formed therein a socket for receiving the portion of the bit body opposite from the base of the triangle, and means for holding said clamping element tightly in place within the bit block.
6. A cutter bit comprising a body of triangular formation in side elevation and of polygonal cross section and formed with plane cutting faces at the equal sides of the triangle.
7. A cutter bit comprising a body of triangular formation in side elevation and of polygonal cross section in the form of a parallelogram.
8. A cutter chain including a bit block having a socket, a cutter bit having a body in the form of an obtuse angled isosceles triangle in side elevation and having cutting surfaces formed at its equal sides, and means for holding said bit in cutting position on said block with a portion thereof projecting within the bit block socket.
9. A cutter chain including a bit block having a socket, a cutter bit having a body in the form of an obtuse angled isosceles triangle in side elevation and having cutting surfaces formed at its equal sides, and means for holding said bit in cutting position on said block with a portion thereof projecting within the bit block socket and including a holding member having a portion en-

gaging with a cutting surface of the bit to preclude release of the bit from the socket.

10. A cutter chain including a bit block having a socket, a cutter bit having a body in the form of an obtuse angled isosceles triangle in side elevation and having cutting surfaces formed at its equal sides and with its cutting ends formed at the angles opposite its equal sides, and means for holding said bit in cutting position on said block with a portion thereof projecting within the bit block socket.

11. A cutter chain including a bit block having a socket, a cutter bit having a body in the form of an obtuse angled isosceles triangle in side elevation, and means for holding said bit in cutting position on said block with a portion thereof projecting within the bit block socket and arranged with an equal side of the triangle engaging a surface parallel with the inner side of the socket.

12. A cutter chain including a bit block having a socket, a cutter bit having a body in the form of an obtuse angled isosceles triangle in side elevation, and means for holding said bit in cutting position on said block with a portion thereof projecting within the bit block socket and arranged with an equal side of the triangle engaging a surface parallel with the inner side of the socket along a line parallel to the path of travel of the cutter chain.

13. A cutter bit having a body in the form of an obtuse angled isosceles triangle in side elevation and of polygonal cross section substantially in the form of a parallelogram.

14. A cutter bit having a body of triangular form in side elevation and having oppositely disposed cutting ends having plane cutting surfaces each generally in the form of an ellipse.

15. A cutter bit having a body in the form of an obtuse angled isosceles triangle in side elevation and having its cutting faces formed at the equal sides of the triangle and with its cutting ends at the angles opposite its equal sides.

16. A cutter chain including a bit block having a socket, the socket having its outer wall inclined forwardly and outwardly, a cutter bit in the form of an obtuse angled isosceles triangle in side elevation, and means for holding the bit in cutting position on the bit block with a portion thereof projecting within the bit block socket, the base of the triangle engaging said inclined wall of the socket.

17. A cutter chain including a bit block having a socket, the socket having its outer wall inclined forwardly and outwardly, a cutter bit in the form of an obtuse angled isosceles triangle in side elevation, and means for holding the bit in cutting position on the bit block with a portion thereof projecting within the bit block socket, the base of the triangle engaging said inclined wall of the socket and one of the cutting surfaces on one equal side of the triangle engaging a surface parallel with the inner wall of the socket.

18. A cutter chain including a bit block having a socket, the socket having its outer wall inclined forwardly and outwardly, a cutter bit in the form of an obtuse angled isosceles triangle in side elevation, and means for holding the bit in cutting position on the bit block with a portion thereof projecting within the bit block socket, the base of the triangle engaging said inclined wall of the socket and one of the cutting surfaces on one equal side of the triangle engaging a surface parallel with the inner wall of the socket along a line parallel with the path of travel of the bit.

19. A cutter bit holding means for a plural-cutting-faced bit including a clamp member in the form of a wedge having a threaded end for engagement by a clamping nut, said member having a surface thereon at an angle to the direction of movement of the clamp by the nut arranged to engage a cutting face of a bit held thereby and another surface for simultaneous engagement with another cutting face of the bit.

20. In a cutter chain, a cutter bit which has when mounted for use a working cutting surface supported at an angle to the path of bodily travel of the bit during cutting, said bit also having a surface making an acute angle with said working cutting surface, and cutter bit holding means including a relatively stationary portion and a clamp element, the latter having a threaded end provided with a clamping nut for drawing said element in a predetermined direction, said clamp element having a surface thereon disposed at an angle to the direction of movement of said element by said nut and arranged to engage said cutting surface of the cutter bit, and said relatively stationary portion having a portion making an acute angle with said surface on said clamp element and engageable by said second mentioned bit surface.

21. A cutter bit holding means for a bit which has sides lying in an obtuse-angle dihedral angle including a clamp member in the form of a wedge receivable in a tapered bit-receiving socket formed in a bit block and having a recess for receiving that part of the cutter bit which is adjacent and at either side of the edge of the dihedral angle.

22. A cutter bit holding means including a clamp member in the form of a wedge receivable in a tapered socket formed in a bit block and having a recess with plane bottom walls for receiving a part of a cutter bit and a portion extending outwardly into engagement with the forward cutting surface of the cutter bit.

23. In a cutter chain, a cutter bit in the form of an obtuse angled isosceles triangle in side elevation, and bit holding means including a holding member having a recess for receiving the obtuse angled portion of the triangle opposite its base.

24. A bit holding means having a socket, the outer wall of the socket being inclined forwardly and outwardly, a double ended bit having angularly related ends and receivable in said socket and having a surface engageable with the inclined outer wall of the socket, and a holding portion extending outwardly at an acute angle to the outer wall of the socket in engagement with the forward cutting face of the bit for precluding release of the bit from said socket.

25. A cutter bit holding means having a socket, the outer wall of the socket being inclined forwardly and outwardly, a double ended bit receivable in said socket and having oppositely inclined cutting faces, said bit having a surface engageable with the inclined outer surface of the socket, and the inner inactive cutting face of the bit engaging a surface on the holding means along a line parallel with the path of movement of the bit and holding means during cutting, and a holding portion extending outwardly in engagement with the forward cutting face of the bit for precluding release of the bit from said socket.

26. In a cutter bit and link, in combination, a cutter bit having a pair of cutting surfaces at its opposite ends lying in oblique planes making an obtuse angle with each other, and means for

holding said bit against movement in a direction opposite to the direction of travel during cutting including a surface parallel to the direction of travel of the bit during cutting and engaged by the inactive cutting surface, another surface at an acute angle to the first mentioned surface and engaged by the back of the bit, and means for engaging the lower portion of the working face of the bit for preventing forward withdrawal of the latter.

27. A cutter bit for use in mining machines and adapted to perform its cutting function when circulated bodily in a closed orbit comprising a bit body of triangular shape in planes parallel to its orbit of circulation and having opposed cutting ends selectively separately usable to effect cutting.

28. A cutter bit having a body in the form of an obtuse-angled isosceles triangle in side elevation and having cutting portions formed at the angles which are opposite its equal sides.

29. In a cutter chain, a bit block having a bit receiving socket, a cutter bit having points at opposite ends thereof and formed at the ends of elongated faces which lie in the sides of an obtuse dihedral angle and which are identical in outline and each of a form symmetrical with respect to both its major and minor axes, and means for holding said bit against movement in a direction opposite to the direction of travel during cutting including a surface parallel to the path of movement of the cutter chain during cutting and engaged by the inactive cutting face and including a bit holder receivable in said socket for holding said bit on the bit block with said surfaces in engagement.

30. In a cutter chain, a cutter bit having a body in the form of an obtuse-angled isosceles triangle in side elevation and having cutting portions formed at the acute angles opposite its equal sides, and means for holding the bit in position during cutting including means providing an abutment surface engageable with one of the equal sides of said bit.

31. In a cutter chain, a cutter bit having a body in the form of an obtuse-angled isosceles triangle in side elevation and having cutting portions formed at the acute angles opposite its equal sides, and means for holding the bit in position during cutting including means providing an abutment surface engageable with one of the equal sides of said bit, said abutment surface being disposed parallel with the direction of movement of the bit during cutting.

32. In a cutter chain, bit-supporting means, a cutter bit having oppositely disposed, mutually oblique, plane cutting surfaces, an inactive cutting surface engaging a straight surface of the bit-supporting means when the bit is in operative cutting position, and a bit-holding device engaging a surface on the bit for forcing said engaging surfaces into operative engaging position.

33. A cutter bit having a body in the form of an obtuse-angled isosceles triangle in side elevation and having alternatively active cutting portions formed at the angles which are opposite its equal sides, and means for supporting said bit during cutting including means providing an abutment surface engageable with the inactive cutting portion of said bit, and means precluding separation or relative longitudinal movements of said last mentioned portion and said abutment surface during cutting.

34. In combination, a double-ended cutter bit having relatively inclined cutting faces and a surface the elements of which make similar angles with said cutting faces respectively, and means for supporting said bit and moving the same during cutting including bit holding means providing a socket having an outer wall thereof inclined forwardly and outwardly with respect to a tangent to the path of travel of said bit supporting and moving means, said outer wall engageable by the bit surface, said above-mentioned bit holding means providing a further surface also inclined forwardly and outwardly with respect to a tangent to the path of travel of said bit supporting and moving means but more nearly perpendicular to such tangent, said further surface engaging the forward cutting face of the bit to preclude release of the latter from the socket, and said bit holding means providing a third surface engageable in surface contact with the other of said relatively inclined cutting faces and forming an abutment to sustain the inward reaction of the bit during cutting.

35. In combination, a cutter bit having when in use a forward cutting face, a rearward surface the elements of which make acute angles with said cutting face, and an inward surface disposed at a substantial angle with respect to said cutting face and said rearward surface, and means for supporting said bit and moving the same during cutting including bit holding means providing an outer bit engaging wall providing a surface inclined forwardly and outwardly with respect to a tangent to the path of travel of said bit supporting and moving means, said outer wall surface engageable by said rearward bit surface and supporting the bit with its cutting surface forwardly inclined, said bit supporting and moving means providing further an inwardly disposed surface forming an abutment for and supporting said inward surface on said bit, and said bit supporting and moving means still further providing a surface engageable with the cutting

surface of the bit inwardly of the outermost end of the latter and cooperating in precluding escape of said bit from its holding means.

36. In combination, a cutter bit having when in use a forward cutting face, a rearward surface the elements of which make acute angles with said cutting face, and an inward surface disposed at a substantial angle with respect to said cutting face and said rearward surface, and means for supporting said bit and moving the same during cutting including bit holding means providing an outer bit engaging wall providing a surface inclined forwardly and outwardly with respect to a tangent to the path of travel of said bit supporting and moving means, said outer wall surface engageable by said rearward bit surface and supporting the bit with its cutting surface forwardly inclined, said bit supporting and moving means providing further an inwardly disposed surface forming an abutment for and supporting said inward surface on said bit, and said bit supporting and moving means still further providing a surface engageable with the cutting surface of the bit inwardly of the outermost end of the latter and cooperating in precluding escape of said bit from its holding means, said bit being releasable from its moving and holding means upon movement of two of the surfaces provided thereby relative to the third.

37. In combination, a bit having a forward cutting face, a rearward surface making an acute angle with said cutting face and an inward surface disposed at a substantial angle with respect to said cutting face and said rearward surface, and supporting means for said bit including a surface coacting with said rearward bit surface and upon which the reaction of the bit during cutting tends to produce an inward bit movement, means providing an abutment engageable by the inward bit surface to limit such inward bit movement, and holding means coacting with the forward cutting face of the bit but leaving the outer end thereof clear.

JOHN ROSS.

DISCLAIMER

2,020,215.—*John Ross*, Michigan City, Ind. CUTTER CHAIN. Patent dated November 5, 1935. Disclaimer filed December 27, 1943, by the assignee, *Sullivan Machinery Company*.

Hereby enters this disclaimer to claims 4, 20, 21, and 22.

[*Official Gazette January 25, 1944.*]