N. PEDULLA.

HAND MINING MACHINE.

APPLICATION FILED DEC. 22, 1919.

1,357,510.

Patented Nov. 2, 1920.

2 SHEETS—SHEET 1.

Fig. 1.

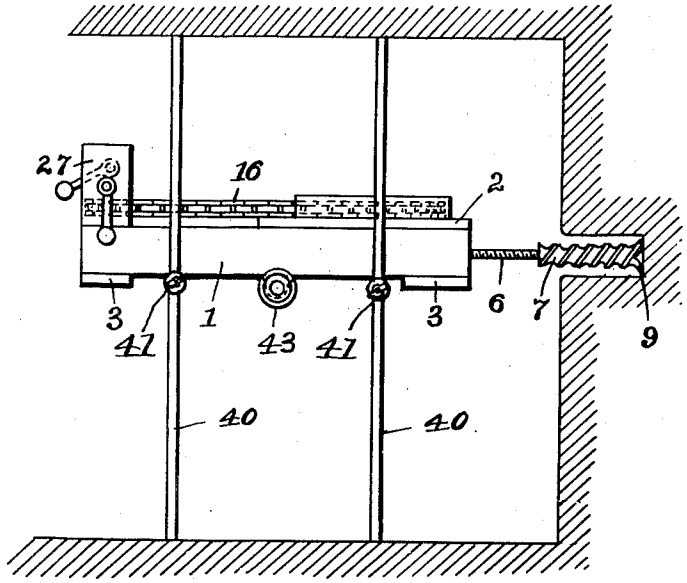


Fig. 2.

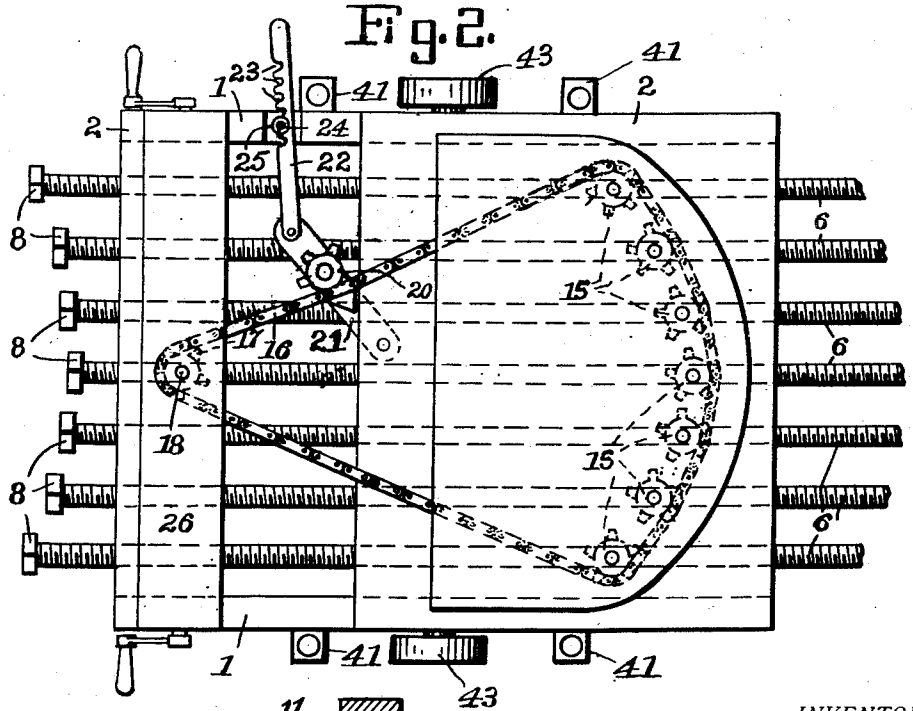
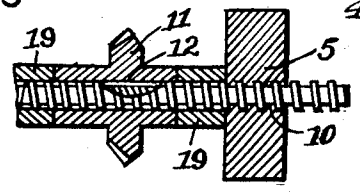


Fig. 6.



INVENTOR

Nicola Pedulla,

By Geo. A. Hutchinson

Attorney

N. PEDULLA.

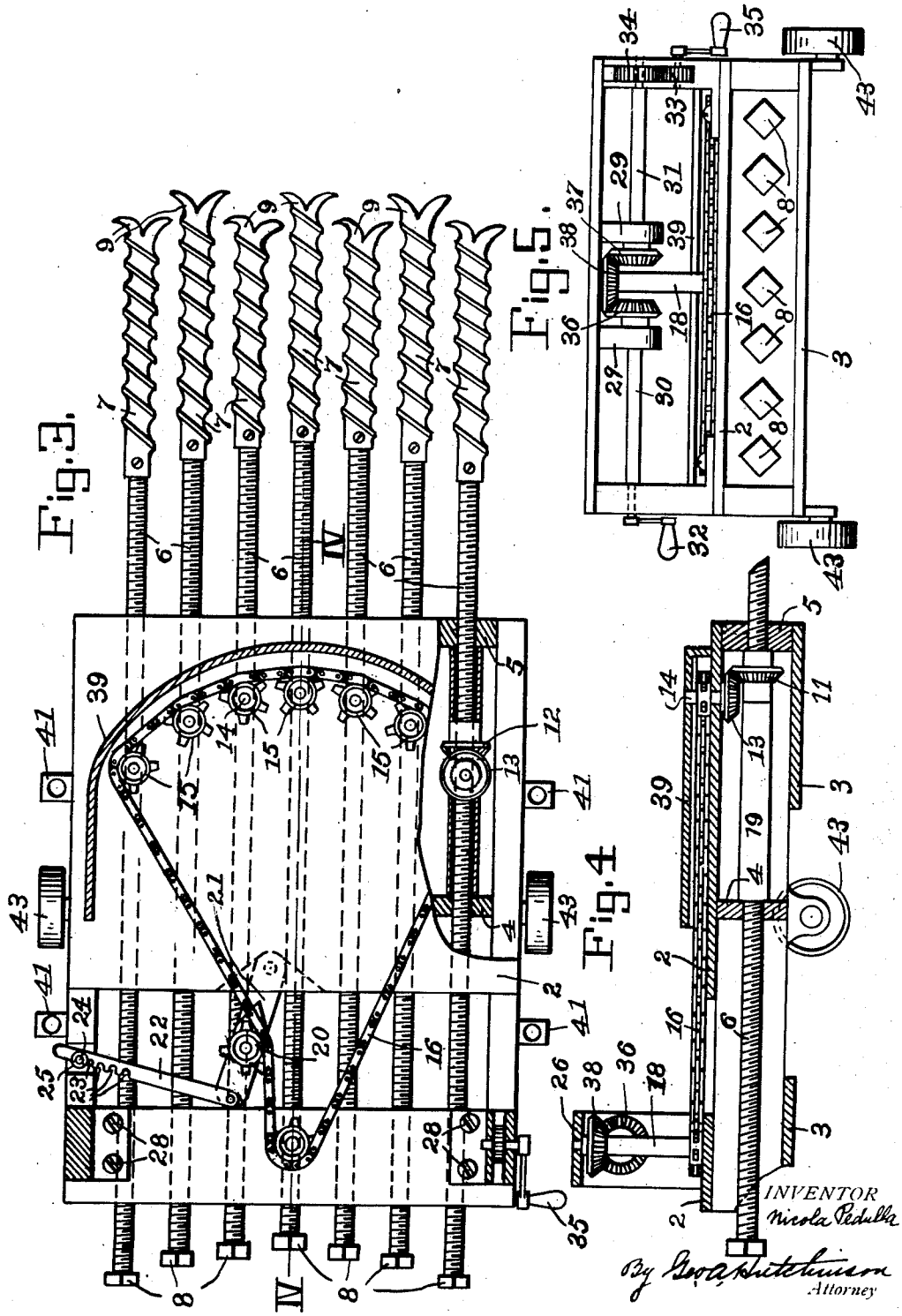
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2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

NICOLA PEDULLA, OF MACDONALDTON, PENNSYLVANIA.

HAND MINING-MACHINE.

1,357,510. Specification of Letters Patent. Patented Nov. 2, 1920.

Application filed December 22, 1919. Serial No. 346,466.

To all whom it may concern:

Be it known that I, NICOLA PEDULLA, a citizen of the United States, residing at Macdonaldton, in the county of Somerset and State of Pennsylvania, have invented certain new and useful Improvements in Hand Mining-Machines, of which the following is a full, clear, and exact specification.

This invention relates to mining machines for cutting kerfs in a wall of coal or other mineral deposit, so that blocks of said mineral may be broken out between the kerfs.

One object of this invention is to provide improved and simplified means for simultaneously actuating a plurality of boring tools, for cutting a continuous kerf, from a single driven gear, and another object is to provide improved and simplified means for driving said gear by hand and allow for said tools being rotated more rapidly when they are being withdrawn after the kerf has been cut than when the tools are being advanced in the cutting operation. The invention also contemplates the provision of hand operating means which permits the clockwise rotation of a crank in withdrawing the tools as well as in advancing them, and which may be adjusted for use by a left-handed workman so as to advance and retract the tools by anti-clockwise rotation of the handles. Other objects will appear as the description proceeds.

The invention will be first hereinafter described in connection with the accompanying drawings, which constitute part of this specification, and then more specifically defined in the claims at the end of the description.

In the accompanying drawings, wherein similar reference characters are used to designate corresponding parts throughout the several views:—

Figure 1 is a side elevation of a mining machine constructed substantially in accordance with this invention, said machine being shown supported in position as when cutting a kerf about half way up a wall of coal.

Fig. 2 is a plan view of the machine drawn to a larger scale and with the front ends of the tool-carrying shafts broken away.

Fig. 3 is a similar view showing the tools on the ends of the shafts, a different adjustment of the sprocket chain tightener, and certain parts of the machine broken away to more clearly illustrate other parts.

Fig. 4 is a section on the line IV—IV of Fig. 3.

Fig. 5 is a rear end elevation of the machine showing the two cranks and shafts more clearly, and

Fig. 6 is an enlarged detailed section through the spacing sleeves and splined beveled pinion on one of the tool-carrying shafts, said shaft being also shown in threaded engagement with the bearing member extending across the front end of the machine casing.

A rectangular frame consisting of side members 1, top transverse members 2 and bottom transverse members 3 serves to support the operating parts of the machine. Between said side members 1 there are also arranged two cross bars 4 and 5, through which a plurality of screw threaded shafts 6 are passed. Seven of said shafts are shown in the drawings, but this number may be changed without departing from my invention.

The shafts 6 are arranged parallel to each other and each carries a boring tool 7 on its front end and has a head 8 on its rear end. The tools have flared overlapping cutting ends 9 alternate ones of which are arranged slightly in advance of the others, as shown in Fig. 3, so that a continuous kerf will be cut by the simultaneous rotation and advance of all of the tools or bits 7.

The shafts 6 are simply guided in the rear cross bar 4 but they engage internal screw threads 10 in the front cross bar 5, as shown in Fig. 6, so that when rotated said shafts will be fed forward or rearward through said front cross bar according to the direction of rotation. To rotate each shaft a beveled pinion 11 is splined at 12 thereon, as also shown in Fig. 6, and another beveled pinion 13, carried on the lower end of a vertical shaft 14 journaled in one of the top transverse members 2, meshes with said pinion 11. On the upper end of each of the vertical shafts 14, which are equal in number to the tool-operating shafts 6, a sprocket wheel 15 is mounted. These sprocket wheels and the vertical shafts 14, as well as the pinions mentioned, are arranged in an arcuate line across the frame of the machine, so that all of said sprockets may be operatively engaged by a sprocket chain 16 which also passes around a driven sprocket wheel 17 on a vertical shaft 18 rising from the rear end portion of the frame. To position

the pinions 11 on their respective shafts 6 so as to maintain the arcuate arrangement just mentioned, spacing sleeves 19 of suitable lengths are placed loosely around the shafts 6 at either side of said pinions as occasion requires between them and the cross bars 4 and 5. Thus the middle shaft, as shown in Fig. 4, need have only one sleeve and that in rear of the pinion 11, whereas the other shafts have spacing sleeves 19 both in front and in rear of their pinions, the relative lengths of said sleeves varying as required.

The sprocket chain 16 may be tightened by means of an idler sprocket 20 mounted on a swinging arm 21 and adapted to be adjusted by any suitable means such as the strip 22 which may have a series of notches 23 to engage a pin 24 on one of the side members 1 of the frame. A clamping nut 25 may be placed on said pin 24 for retaining the strip in adjusted position.

The vertical shaft 18 has its upper end bearing in a cross piece 26 supported above the rear end of the frame of the machine by uprights 27 which are detachably secured to the rear transverse member 2 by screws 28, Figs. 3 and 5. Journaled in said uprights 27 and bearing blocks 29 depending from the cross piece 26 at either side of the shaft 18 are two operating shafts 30 and 31 one extending to either side of the machine. The shaft 30 has a hand crank 32 mounted directly on its outer end as best shown in Fig. 5, while the outer end of the shaft 31 carries a gear 33 meshing with another gear 34 journaled in the same upright and to which another crank 35 is connected. Both shafts 30 and 31 carry beveled pinions 36 and 37, respectively, which mesh with a beveled pinion 38 on the vertical shaft 18 so that the rotation of either of the shafts 30 or 31 by their hand cranks 32 and 35 will actuate all of the tool-carrying shafts through the sprocket wheels and chain. As illustrated in the drawings, the rotation of the crank 35 in a clockwise direction will feed the tools forward, while the rotation of the crank 32 also in a clockwise direction will retract the tools. By varying the sizes of the gears 33 and 34 the tools may be fed forward more slowly than they are retracted with the same speed of rotation of the cranks 32 and 35. By reversing the cranks, with the shafts 30 and 31 and their supporting uprights and cross piece 26 on the frame of the machine, which can be readily done after the screws 28 are removed, the machine may be readily adjusted so that a left-handed workman may advance the tools by turning the crank 35 anti-clockwise, and retract said tools by turning the crank 32 anti-clockwise.

The sprockets 15 and greater portion of the sprocket chain are covered by a shield 39 to exclude coal dust. The machine is bodily supported at the proper level for cutting the kerf in the wall of coal, as shown in Fig. 1, by vertical rods 40 suitably secured to the floor and ceiling of the mine chamber. Said rods pass through perforated lugs 41 on the sides of the machine, and set screws 42 are fitted in said lugs to bind the rods therein for holding the machine at the desired level. Wheels 43 are provided for moving the machine from place to place.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. In a mining machine, the combination with a plurality of boring tools, of means for simultaneously actuating said tools including a vertical shaft, a beveled pinion on said shaft, oppositely extending horizontal shafts, pinions on said shafts meshing with diametrically opposite portions of the pinion on the vertical shaft, a hand crank mounted directly on one of said horizontal shafts, another hand crank, and gearing connecting said second crank with the other horizontal shaft for the purpose specified.

2. In a mining machine, the combination with a plurality of boring tools, of means for simultaneously actuating said tools including a vertical shaft, a pinion on said shaft, hand cranks arranged on opposite sides of the machine, and driving connections between said cranks and said pinion on the vertical shaft whereby the rotation of one crank in a clockwise direction on its side of the machine will advance the tools and the rotation of the other crank in a clockwise direction on its side of the machine will retract said tools more rapidly than they are advanced by the same speed of rotation of the two cranks.

3. In a mining machine, the combination with a plurality of boring tools, of means for simultaneously actuating said tools including a vertical shaft, hand cranks arranged at opposite sides of the machine, gearing from said cranks to the vertical shaft so that the tools may be actuated by either crank, and a supporting frame for said cranks and gearing detachably secured to the machine and adapted to be reversed thereon whereby clockwise rotation of a crank on one side of the machine in one adjustment of said frame will advance the tools, and anti-clockwise rotation of the crank on the same side of the machine in the other adjustment of said frame will advance said tools.

In testimony whereof I have signed my name to this specification.

NICOLA PEDULLA.