

(No Model.)

2 Sheets—Sheet 1.

J. STEPHENSON.
MINING MACHINE.

No. 444,027.

Patented Jan. 6, 1891.

Fig. 1.

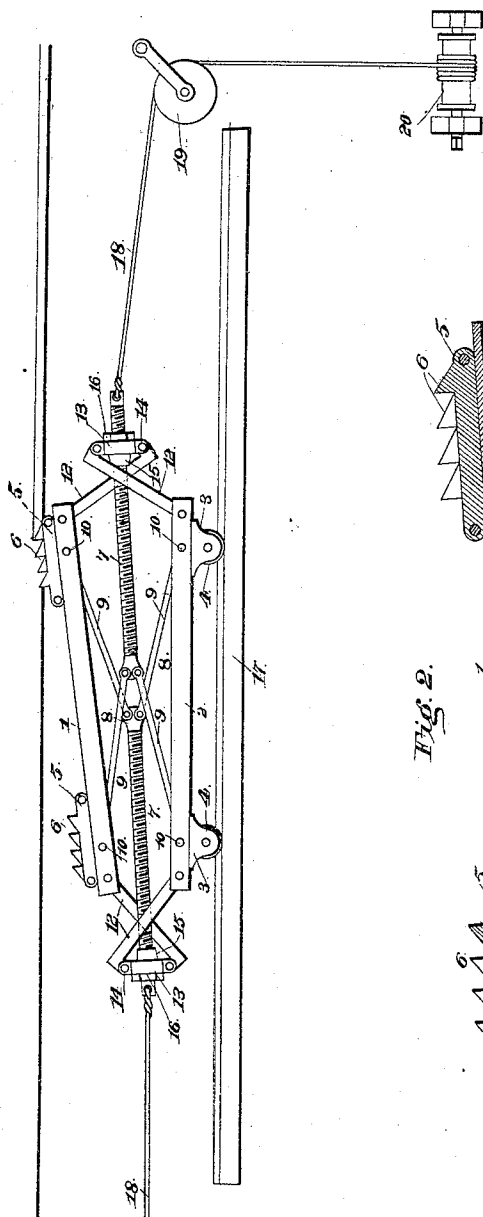
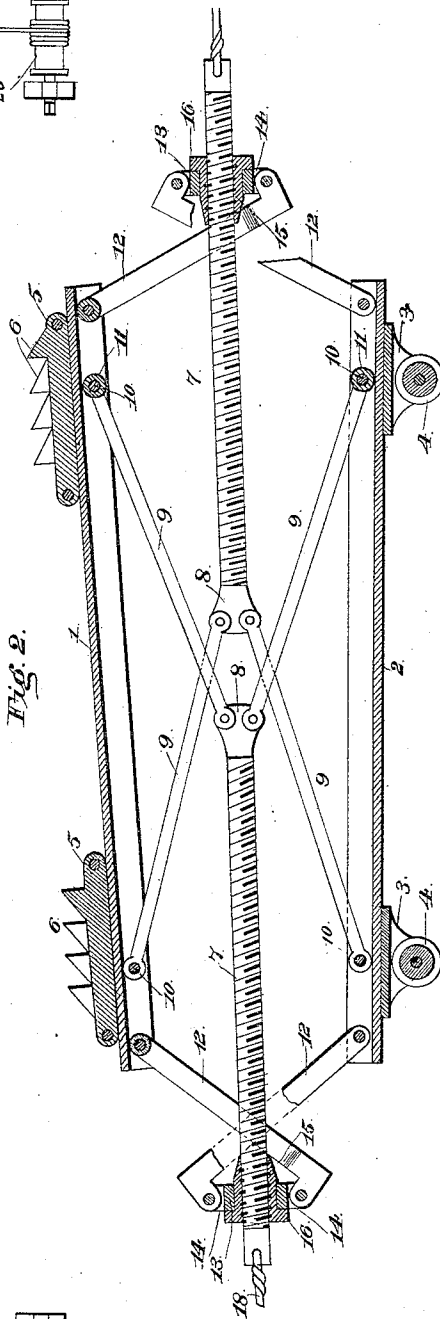


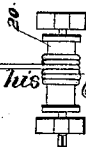
Fig. 2.



Witnesses

M. L. Fowler
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Inventor

Joseph Stephenson

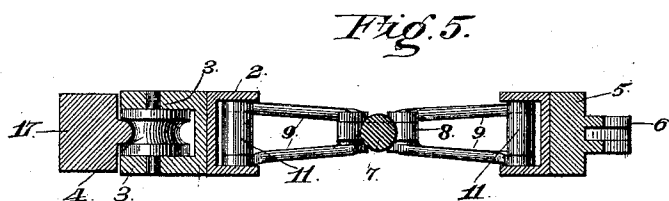
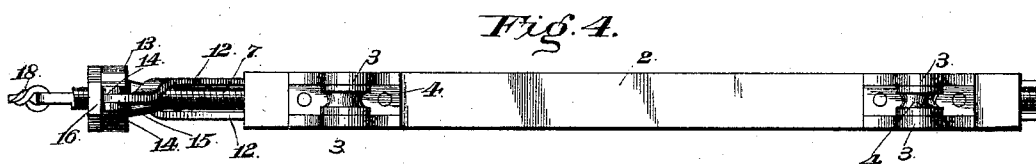
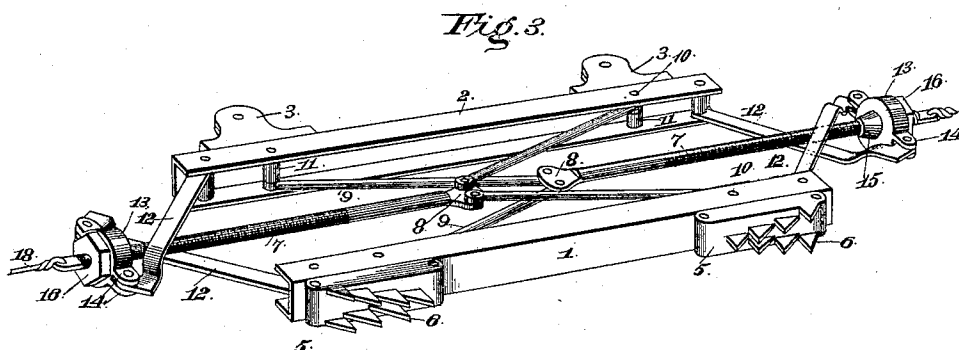
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

JOSEPH STEPHENSON, OF SPARLAND, ILLINOIS.

MINING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 444,027, dated January 6, 1891.

Application filed September 8, 1890. Serial No. 364,305. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH STEPHENSON, a citizen of the United States, residing at Sparland, in the county of Marshall and State of Illinois, have invented a new and useful Mining-Machine, of which the following is a specification.

This invention relates to mining-machines of that class which are used especially for the purpose of mining coal; and it has for its object to construct a machine for this purpose, by means of which coal may be mined more easily and quickly than by the methods now in general use.

My invention consists specifically in the improved construction of a device which may be termed a "plow," by means of which furrows of considerable length and depth may be cut in the solid wall of the coal which has been previously dressed, so as to present a smooth surface.

The invention further consists in the improved construction and arrangement of details, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings, Figure 1 is a plan view of my improved mining-machine, showing the same arranged in position for operation. Fig. 2 is a horizontal sectional view of the mining-machine, showing the same expanded. Fig. 3 is a perspective view of the device. Fig. 4 is a side elevation. Fig. 5 is a transverse sectional view.

Like numerals of reference indicate like parts in all the figures.

The frame of my improved mining-machine is composed of the side rails 1 and 2, which are constructed of metal beams, which are U-shaped in cross-section, each having the longitudinal groove in its inner side. The outer beam 2 is provided on its outer side with ears or lugs 3, forming boxes or bearings in which friction-rollers 4 are journaled. The inner beam 1 is provided on its outer side with blocks 5, having inwardly-extending teeth or cutters 6. These blocks are two in number, arranged at the ends of the frame-bar, and the teeth or cutters at the two ends are beveled in opposite directions in order to enable the machine to cut in both directions of its movement.

7 7 designate a pair of rods, the outer ends of which are screw-threaded and the inner ends of which are provided with flattened heads 8. To each of the said heads is pivoted a pair of rods 9 9, which extend nearly to the ends of the frame-piece, with which they are pivotally connected, the grooves in the inner sides of said frame-beams serving to receive the ends of said connecting-rod. The pivotal pins 10, upon which said connecting-rods are mounted, are provided with spacing-thimbles 11, to retain said rods in proper position. The employment of said thimbles is due to the fact that it is necessary to arrange the rods 7, having the extension-rods 9, one above the other, and it becomes necessary to space them in the manner described in order to prevent them from interfering with each other during the operation of the machine.

To the ends of the frame-bars 1 and 2 are pivoted the link-rods 12 12, which cross each other at the ends of the machine, and to which is pivotally connected the seat-rings 13, having diametrically-opposite lugs 14 to receive the pivotal pins. These rings serve as seats for the nuts 15, which are screwed onto the outer ends of the screw-threaded rods 7, said nuts being provided with flanges 16, that bear against the outer sides of the seat-rings.

It will be observed that by tightening the nuts 15 upon the rods 7 the links 12 will force the inner and outer frame-beams 1 and 2 apart from each other, the rods 7 and extension-rods 9 serving to brace the entire frame and to enable it to resist the pressure to which in practice it will be subjected.

In the operation of my improved mining-machine it is first necessary to dress the wall of coal which is to be operated upon to a smooth and flat surface. A track 17 is then provided parallel to the wall of coal, upon which the rollers 4 of the machine may ride, said track being at a distance from the wall of coal equal to the width of the machine when entirely collapsed. By tightening the nut 15 at one end of the machine the frame of the latter is next expanded, so as to give the teeth at that end of the machine a firm bite in the wall of coal. The end of the frame which is thus expanded is the one which may

at the time be termed the "rear end," according to the direction in which the machine is to travel. Wire cables 18 are attached to the ends of the rods 7, and these wire
 5 cables are guided over pulleys 19 to winding-drums 20, which may be operated by steam, compressed air, or other suitable means. Motion in the desired direction is now imparted to the machine, which, traveling along
 10 the track, cuts a furrow in the wall of coal. The nut at the opposite end of the machine is now tightened sufficiently to cause the teeth at that end to bite firmly into the coal, after which the machine is caused to travel
 15 in the opposite direction, thus deepening the furrow. This operation is repeated until the machine has been expanded to its utmost extent, when a horizontal groove will have been cut to a considerable depth in the wall of
 20 coal, the depth of said furrow being governed by the extent to which the machine may be expanded. The machine may now be removed and the operation repeated at a different elevation, after which the coal between
 25 the two grooves thus formed may be easily removed by blasting or otherwise.

The advantages of this invention will be readily understood from the foregoing description, taken in connection with the drawings hereto annexed. Its operation is very
 30 rapid and efficient and a great saving of power is effected thereby. Those mining-machines which operate by drilling practically grind the material which is removed by the
 35 drills into powder, while by my invention the teeth or cutters serve to split and cut away the material removed thereby.

The construction of my improved mining-machine is simple and inexpensive, and it
 40 may be readily manipulated with satisfactory results even by comparatively inexperienced hands.

Having thus described my invention, I claim—

45 1. In a mining-machine, the combination, with the side frame-pieces, one of which is provided with rollers and the other with teeth or cutters, of mechanism for expanding or forcing apart the said frame-pieces, substantially as set forth.

50 2. In a mining-machine, the combination, with the side frame-pieces, one of which is provided with rollers and the other with teeth or cutters, of mechanism for expanding or forcing apart the ends of said frame-pieces independently of each other, substantially as set forth.

3. In a mining-machine, the combination

of the side frame-pieces provided, respectively, with rollers and with teeth or cutters, 60 the link-rods pivoted at the ends of said frame-pieces and crossing each other, the longitudinal rods having screw-threaded ends, the seat-rings mounted pivotally at the ends of the link-rods, the nuts mounted upon the ends of the 65 screw-threaded rods and seated in said rings, and pivoted rods connecting the inner ends of said screw-threaded rods with the ends of the frame, substantially as set forth.

4. The combination of the channeled or U- 70 shaped frame-pieces, one of which is provided with teeth or cutters, the link-rods pivoted at the ends of said frame-pieces and crossing each other, the seat-rings mounted pivotally at the ends of said link-rods, the screw- 75 threaded rods having flattened inner ends, the pivoted rods connecting the same with the ends of the frame-pieces, the spacing sleeves or thimbles, and the flanged nuts seated in the rings at the ends of the link-rods and 80 mounted upon the screw-threaded rods, substantially as set forth.

5. In a mining-machine, the combination, with the expansible frame, of the rollers 85 mounted in suitable bearings upon the outer side of one frame-bar and the blocks secured at the ends of the other frame-bar, said blocks being provided with beveled teeth or cutters which are beveled in opposite directions at the opposite ends of the frame, substantially 90 as and for the purpose set forth.

6. The mining-machine consisting of the herein-described expansible frame, provided on one side with grooved wheels or rollers 95 and on the opposite sides with beveled teeth or cutters, in combination with the cables attached to the ends of the machine, the guide-track, the guide-pulleys, and the winding-drums, substantially as and for the purpose 100 specified.

7. In a mining-machine, the frame composed, essentially, of the side pieces equipped, respectively, with wheels or rollers and with teeth or cutters, in combination with the pivoted rods or links connecting said pieces, and 105 means for expanding the ends of the frame independently of each other, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in 110 presence of two witnesses.

JOSEPH STEPHENSON.

Witnesses:

R. L. ORCUTT,
 F. R. WIER.