

No. 736,705.

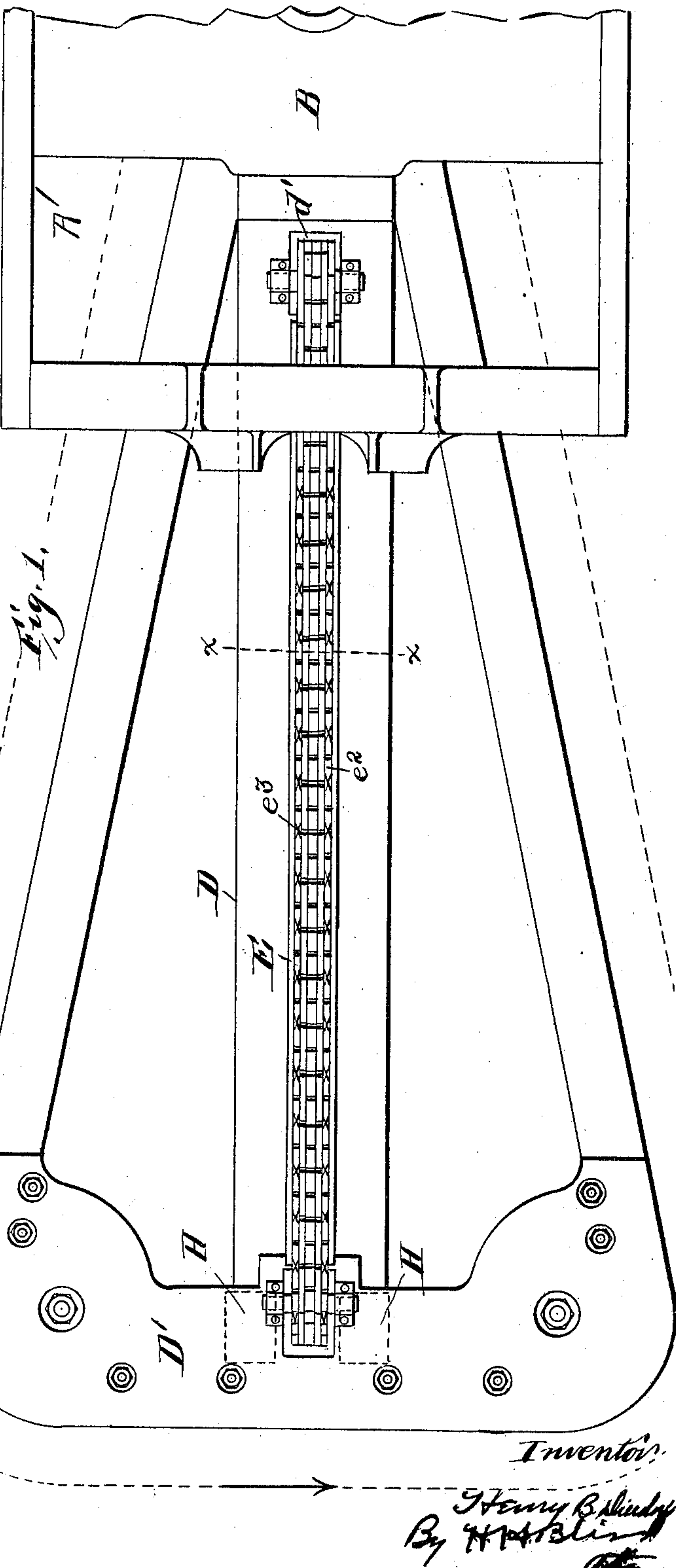
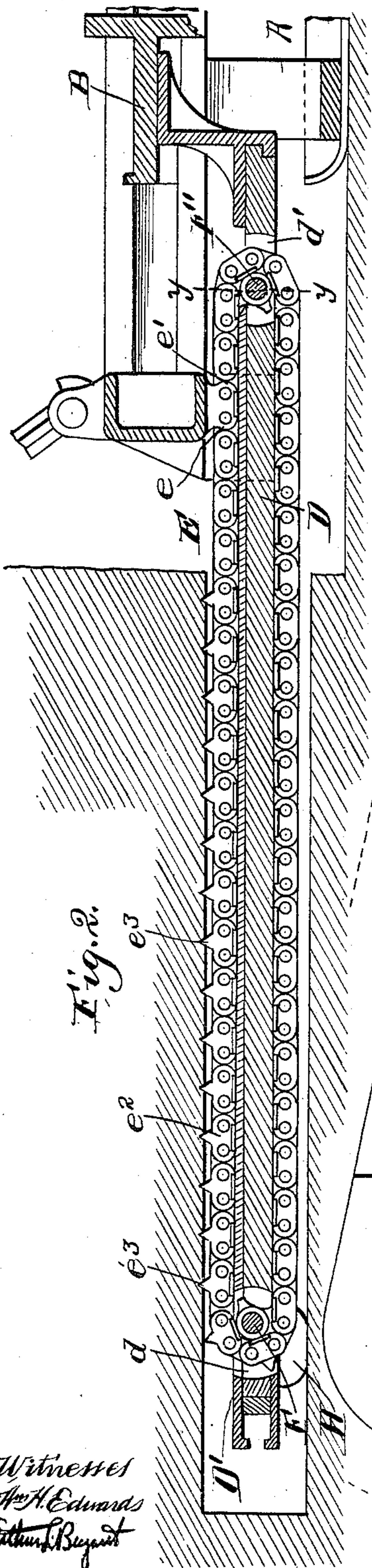
PATENTED AUG. 18. 1903.

H. B. DIERDORFF.
MINING MACHINE.

APPLICATION FILED DEC. 10, 1896. RENEWED DEC. 28, 1898.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses
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Arthur. B. Bryant

Inventor.

Henry B. Dierdorff
By H. H. B. Dierdorff

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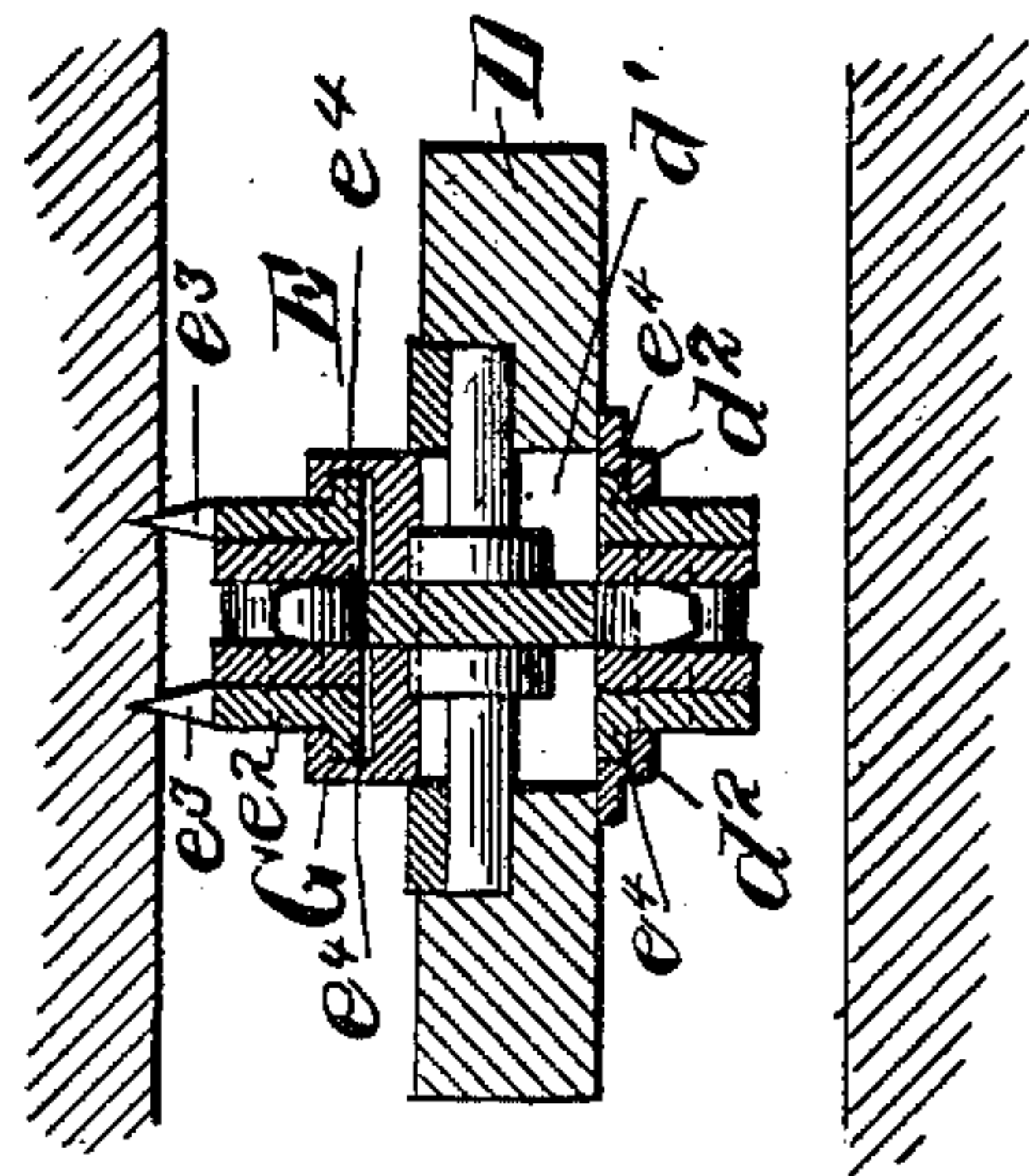


Fig. 5.

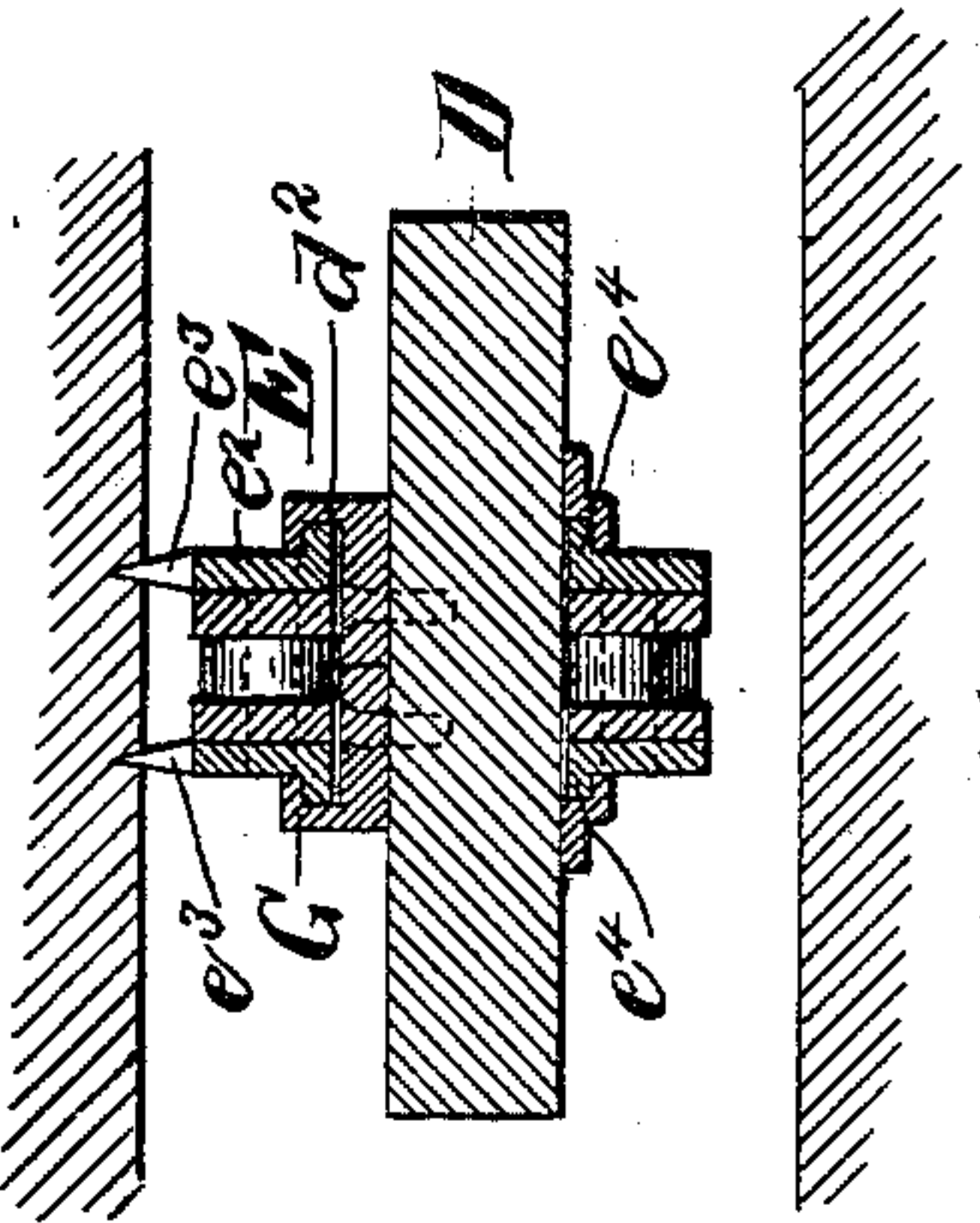


Fig. 4.

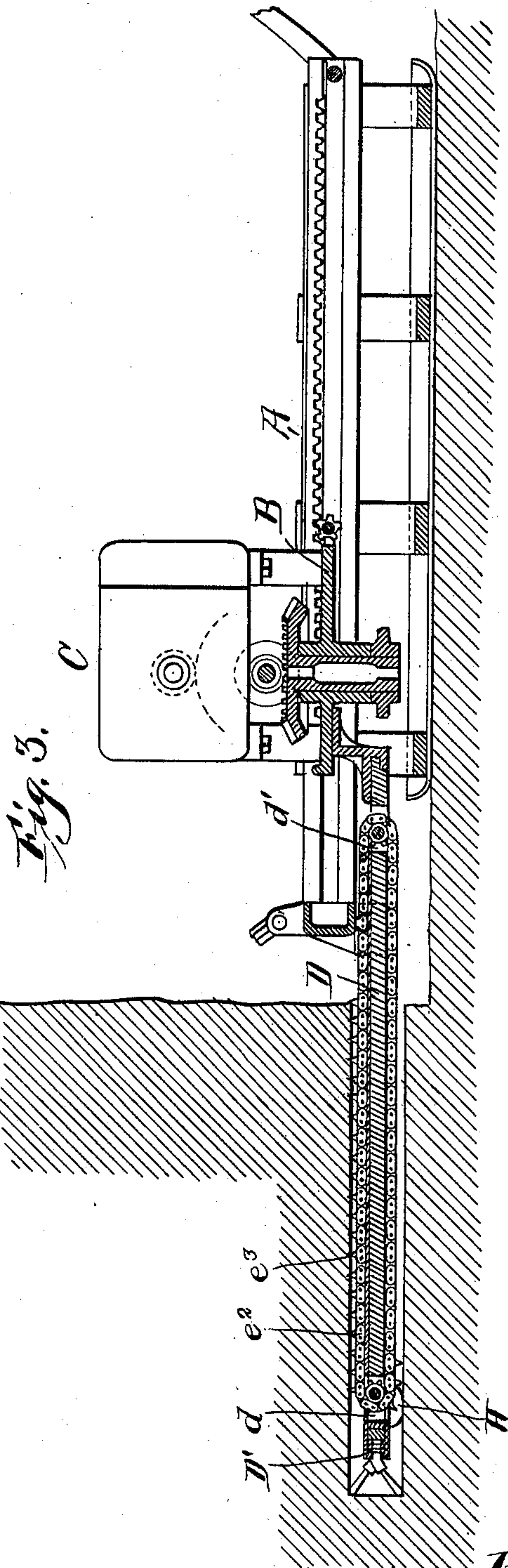


Fig. 3.

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UNITED STATES PATENT OFFICE.

HENRY B. DIERDORFF, OF COLUMBUS, OHIO, ASSIGNOR TO JOSEPH A. JEFFREY, OF COLUMBUS, OHIO.

MINING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 736,705, dated August 18, 1903.

Application filed December 10, 1896. Renewed December 28, 1898. Serial No. 700,559. (No model.)

To all whom it may concern:

Be it known that I, HENRY B. DIERDORFF, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Mining-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Figure 1 is a plan view of a portion of a mining-machine sufficient to illustrate the manner of applying my improvements. Fig. 2 is a longitudinal central section thereof. Fig. 3 shows on a smaller scale a section of all the principal parts of the machine. Fig. 4 is a cross-section on the line $x x$, Fig. 1. Fig. 5 is a section on the line $y y$, Fig. 2.

In the drawings I have shown a bed-frame, a carriage, a motor, and some of the gearing used in machines of the sort heretofore invented by me, each of which has upon the carriage a horizontal moving cutter-chain adapted to form a kerf or undercut in coal of suitable width and of a height such that it freely permits the entrance of the forward projecting parts of the chain-frame or carriage. The chain carries cutters which travel around the chain-frame, the points of the cutters traveling on a line indicated by the dotted line t , Fig. 1, and in the direction indicated by the arrow in said figure.

The bed-frame is indicated as a whole by A, the carriage by B, and the motor by C, the latter being mounted upon the rear end of the carriage and moving therewith forward and back upon the bed, such motion being caused by racks and pinions. Instead of the details of these parts herein shown any others that are preferred can be employed. The carriage comprises the chain-frame, having one or more longitudinally-arranged bars D and also a motor-frame or engine-frame at the rear. In machines of my preferred form use is made of a single central longitudinal thrust-bar, which projects forward from the engine-supporting or motor-supporting part of the carriage and is connected at its front end to the transversely-arranged cutter-head D'. The cutter-chain when traveling around its frame

and when the cutters are at work upon the coal tends to jerk or strain the frame more or less in the direction opposite to the travel of the cutter-chain. One of the objects of the present invention is to provide a mechanism which shall avoid the disadvantages incident to this section of the cutters, and the purpose is to provide a holder for the carriage, which shall engage with the coal over a prolonged line—in fact, give a bracing support to the carriage against side thrust over a distance practically equal to that which the carriage extends into the kerf. Heretofore devices have been used and proposed which were intended to accomplish this, but which were capable of engagement with the coal only at a single point or over a relatively short line; and in most cases where the line of holding had any extension at all the parts were of such nature that a relatively deep channel or groove had to be formed in the coal supplemental to the main kerf formed by the chain. In the present construction a holder is provided which does not require the cutting of any channel or groove, but which provides an elongated series of holding or bracing points on longitudinal lines, and by reason of the distribution of this action throughout the entire length of the projecting part of the carriage but little force is required at any one point to effect the holding engagement with the coal.

The holding device is indicated as a whole by E. It consists of a chain whose ends at $e e'$ are secured to the bed-frame. From the end of e it extends forward along the top of the bar D to an aperture at d , suitably near the cutters at the front of the carriage, then down through said aperture and along the under side of the bar D, and thence up through an aperture d' to the end e' , fastened as aforesaid to the frame. A suitable number of the links e^2 of this chain are provided with spurs or prongs e^3 , and that part of the chain which lies on the upper part of the bar D is so arranged that each of the spurs can slightly penetrate the horizontal wall of the coal, so as to effect a firm engagement. It will be seen that as the chain-frame enters the kerf in the coal formed by the main cutters the chain E will gradually pass from the under

side of the bar D through the forward aperture d to the upper side of the bar D and that each link after passing to said upper side is held stationary because of the rigid fastening of the end at e , which may be considered as the rear end of the chain, from which stationary end the draft on the chain E is exerted during the forward movement of the carriage, and the chain is operated not by a drag on the coal, (through the projections e^3 and tending to disengage them,) but by the draft at the point e exerted on the chain by this fixed point relative to the moving carriage. The spurs in the machine herein described are merely pressed upward into the coal, there being no tendency to have them move along the coal on the lines of carriage travel. The bed prevents the carriage from thus moving the spurs and insures that they shall be merely embedded, thus preventing the breaking down or shaling off of the coal layers. Again, as the links one after another pass to the upper side of the bar their spurs e^3 in succession attain a slight engagement with the coal, and thus the bar D and the carriage-frame are braced from end to end, the result being to hold them against vibration and shaking and to keep them more rigidly in line than has been possible with any machine of which I have knowledge. On the other hand, when the carriage is being withdrawn from the kerf the draft on the chain E is exerted from the stationary end e' , which results in causing the chain-links at the front of the carriage to successively pass down through the aperture d after withdrawing from the coal, then along the under side of the bar D, and finally up through the aperture d' to the upper side of the bar D at its rear end. Rollers or sprocket-wheels, such as at F F', can be mounted in the apertures d d' for supporting the chain. At G an abutment is provided along the side of the chain, to which is transmitted any thrust that may be experienced by the links. In order to hold the chain properly in line, this abutment may be formed as a flange-guideway d^2 and the links e^2 can be formed with flanges e^4 . A similar guideway is provided on the under side of the carriage for the purpose of holding the chain up out of engagement with the floor.

To prevent the downthrust exerted by the holding devices from being felt by the carriage, I employ one or more shoes, as at H, secured at suitable places and adapted to ride along the bottom of the cut.

What I claim is—

1. In a mining-machine, the combination of a bed, a carriage movable thereon, cutters mounted on the latter, and a holding device comprising a chain secured at one or more points to the bed independently of said carriage and adapted to travel with the carriage into the kerf and to engage with a wall of the latter.

2. In a mining-machine, the combination of

a bed, a carriage movable thereon, laterally-acting cutters on the carriage, and a holding-chain rigidly secured to the bed independently of said carriage and adapted to have more or less of its links move from the lower side of the carriage to the upper side as the carriage advances and to have said links move in the opposite direction as the carriage recedes.

3. In a mining-machine, the combination of a bed, a carriage movable thereon, cutters mounted on the carriage, and a holding device consisting of the chain provided with spurs and fixedly secured to the bed independently of said carriage, and having two supports on said carriage of which the front one is in advance of the point of attachment to the bed and the rear one is behind such point of attachment.

4. In a mining-machine, the combination of a bed, a carriage movable thereon, laterally-acting cutters on the carriage, and a holding device having a series of coal-engaging projections which come successively into action as the carriage advances, and each of which remains stationary during its engagement with the coal, said holding device being fixedly connected with the bed independently of said carriage.

5. In a mining-machine, the combination of the cutters, and a holding device comprising an endless chain substantially one half or limb of which is provided with coal-engaging projections and the other limb of which is free from such projections.

6. In a mining-machine, the combination of a fixed bed, a carriage movable thereon, cutters on said carriage and a holding device consisting of an endless chain adapted to engage a wall of the kerf and fixedly secured to the bed independently of said carriage, and a sprocket-wheel engaging said chain.

7. In a mining-machine, the combination of a fixed bed, a carriage movable thereon, cutters on said carriage, a holding device consisting of an endless chain adapted to engage the wall of the kerf, mounted at its forward turn on said carriage, and fixedly secured to the bed independently of said carriage, and a sprocket-wheel mounted on the carriage at the rear turn of and engaging said chain.

8. In a mining-machine, the combination with a carriage having a portion arranged to enter a kerf cut by the machine, and a series of cutters carried by the carriage, of a holding device for the carriage consisting of an endless chain adapted to engage with a wall of the kerf and provided with flanges e^4 , the chain being arranged with one portion or limb above the carriage and another portion or limb below the carriage, and supporting means for the lower limb or portion of the holding-chain arranged to engage with the flanges e^4 and support the chain, substantially as set forth.

9. In a mining-machine, the combination with the carriage and the cutters, of a hold-

ing device consisting of an endless chain movable independently of the cutters adapted to engage with a wall of the kerf and having flanges e^4 , and a support on the under side of the carriage with which the flanges of the chain engage arranged to hold the chain from sagging, substantially as set forth.

10. In a mining-machine, the combination of the bed, the carriage adapted to move relative to the bed, the laterally-acting cutters on the carriage, and the holding device consisting of a chain having its rear end connected with the said bed to be stationary therewith, and adapted to travel with the said carriage into the kerf and to engage with the coal on one side of the carriage.

11. In a mining-machine, the combination of the bed, the carriage adapted to move relative to the bed, the cutters on the carriage and the holding-chain having both of its ends attached to the said bed and adapted to have its forward portion travel with the said carriage into the kerf and engage with the coal on one side of the carriage.

12. In a mining-machine, the combination of the bed, the carriage adapted to move relative to the bed, the cutters on the carriage, and the holding-chain having its rear end attached to the said bed and adapted to have certain of its links, at the forward portion of

said chain move from one side of the said carriage to the other side as the carriage advances, and to have said links move in the opposite direction as the carriage is receding.

13. In a mining-machine, the combination of the bed, the carriage adapted to move relative to the bed, the cutters on the carriage, and the holding device consisting of a chain provided with spurs and at one point attached to and stationary with the said bed, and having two supports on the said carriage of which the front one is in front of the point of attachment to the bed and the rear one is behind such point of attachment.

14. In a mining-machine, the combination of the bed, the carriage, the cutters on the carriage adapted to move relative to the bed, and the holding device having a series of coal-engaging projections which come successively into action as the said carriage advances and each of which remains stationary during such advancing of the carriage, the said holding device being at one point attached to and stationary with the said bed.

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

HENRY B. DIERDORFF.

Witnesses:

CYRUS HUTCHINS,
R. H. JEFFREY.