

No. 751,478.

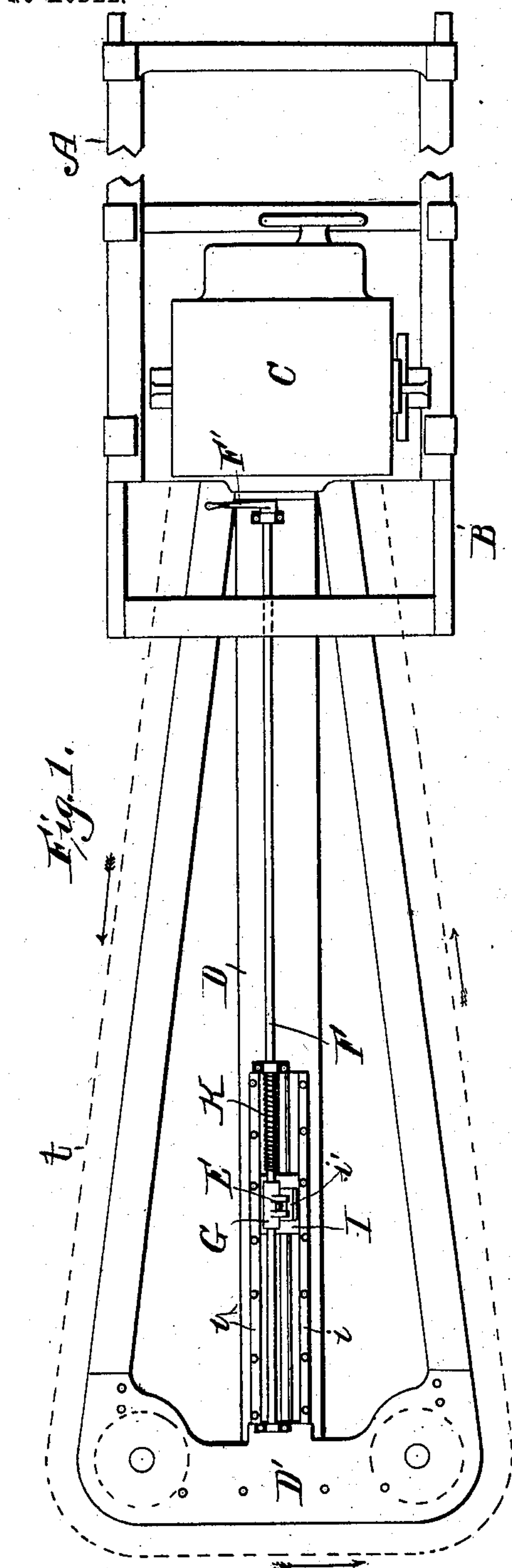
PATENTED FEB. 9, 1904.

H. B. DIERDORFF.
MINING MACHINE.

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

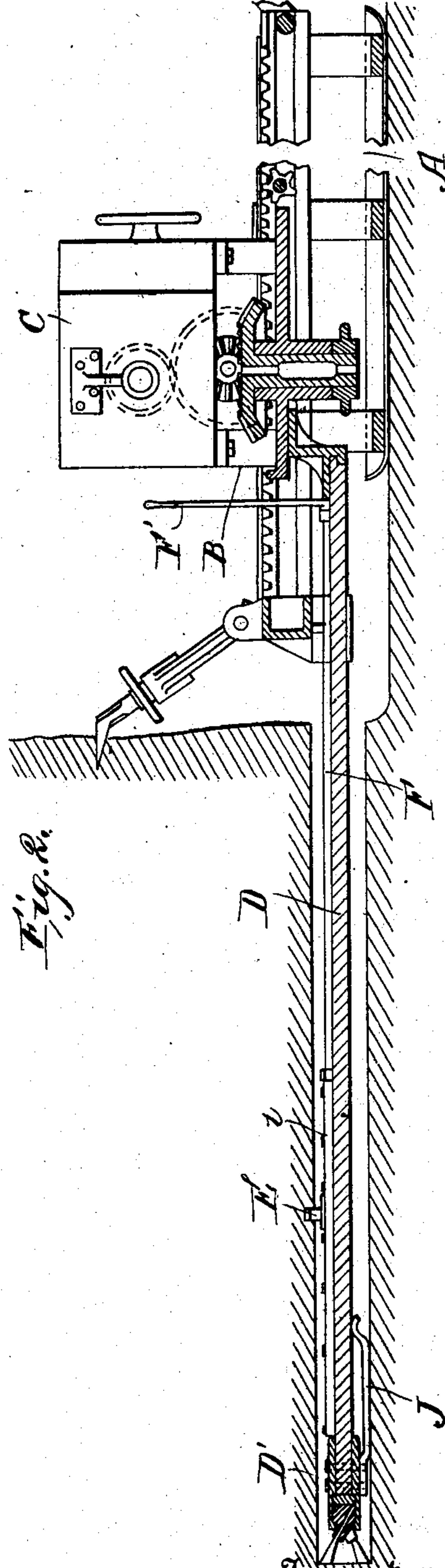
NO MODEL.

2 SHEETS—SHEET 1.



Witnesses

Carroll J. Webster
Arthur L. Bryant



Inventor
Henry B. Dierdorff
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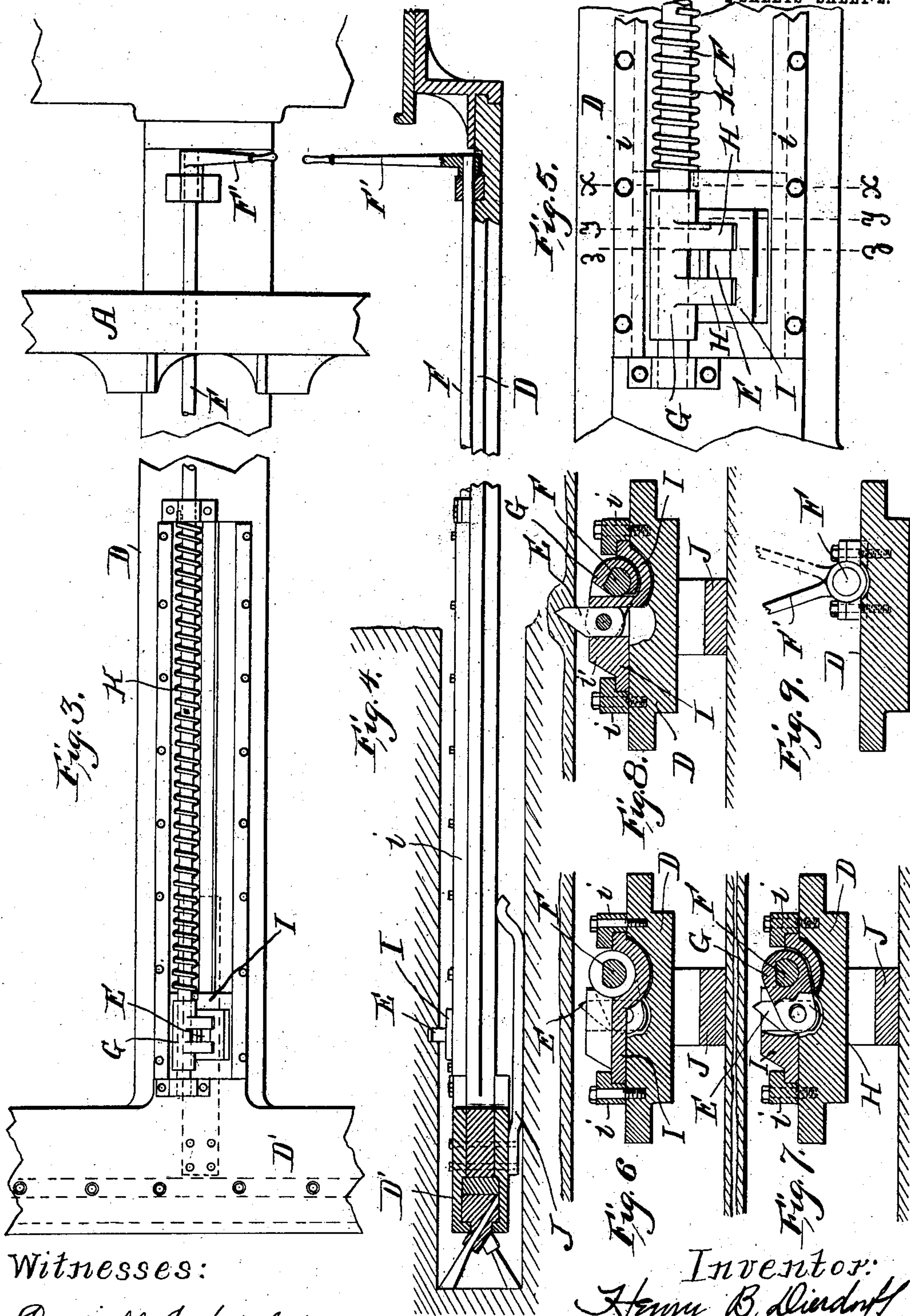
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Carroll J. Webster
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UNITED STATES PATENT OFFICE.

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

MINING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 751,478, dated February 9, 1904.

Application filed December 10, 1896. Renewed December 28, 1898. Serial No. 700,560. (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 improvement. Fig. 2 is a longitudinal section of the same. Fig. 3 is a plan view, on a larger scale, of the central longitudinal bar of the carriage-frame, showing also some of the connected parts. Fig. 4 is a view, partly in side elevation, partly in section, of the devices in Fig. 3. Fig. 5 is a plan view, on a still larger scale, of the holding device. Fig. 6 is a section on line $x x$ of Fig. 5. Fig. 7 is a section on the line $y y$ of Fig. 5. Fig. 8 is a section on the line $z z$ of Fig. 5, showing the holder in place. Fig. 9 is a section on the line $x' x'$ of Fig. 4.

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 the coal of suitable width and of a height such that it freely admits 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 arrows 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 herein shown of these parts any other preferred forms of mechanism can be employed. The carriage comprises the chain-frame having one or more longitudinally-arranged bars

D. 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 this chain-frame and when the cutters are at work upon the coal tends to be jerked or strained more or less in the direction opposite to the travel of the cutter-chain. In some coals this is not a serious matter if the framework of the machine be properly made. In other materials holders have been found advantageous which cut a groove in the horizontal wall of the main kerf and have some projecting parts to ride in said groove, and I have heretofore devised holders of this class for such purposes. In still other materials it is found that the cutting of such a groove necessitates the consumption of considerable power and is itself the cause of undesirable straining of the machine. For such circumstances I have devised means acting by friction upon the top and bottom horizontal walls of the kerf; but there are still other coals where it is found disadvantageous either to expend power in the cutting of a groove or to force the cutter-head between the walls of the kerf when bound by friction-shoes. At the same time it is desirable to have a positive grip upon the stationary coal. The present holding device has been devised to meet circumstances of this latter sort, and it consists in a holder adapted to be engaged with one or both of the horizontal walls of the coal and to be driven by penetration more or less into said walls and to be held stationary in the coal, the cutter-frame being permitted to continue advancing after the engagement of the holder. It is also desirable many times to have a holding device which can be thrown into or out of action either automatically or at the will of the operator at any time during the cut, and in the present construction I have provided means for accomplishing this.

There are other matters of novelty and advantage incident to the present mechanism, which will be understood from the description in connection with the drawings.

The longitudinal carriage-bar D is at a point suitably near the front of the machine provided with a holding-bar E, adapted to be moved into or out of engagement with the adjacent coal and after being put into such en-
5 gagement to remain stationary and permits said bar D to advance in relation to the holder.

As shown in the drawings, which illustrate one of the numerous ways of carrying out
10 this invention, the holder E is connected to a shaft or bar F in a suitable manner, which shaft is mounted on the carriage and is provided with a proper device, such as a lever F', for rocking it in either direction. As
15 shown, this shaft is angular in section and is loosely fitted to a collar or tube G, which latter can slide along the shaft, but will be rocked as the shaft is moved. The collar carries one or more crank-like arms H, which are pivot-
20 ally connected to the holder bar or pin E. When the shaft F is rocked by the lever F', the arms H force the holder E up or down, as above described. In order to provide the holder with a strong abutment, it is mounted
25 in a carrier I, which is also adapted to slide on the bar D, this carrier being held in place in any suitable manner—as, for instance, by guide-cleats *i i*. At *i'* there is a shoulder or thickened mass of metal immediately adjacent
30 to the holder E and adapted to receive the thrust from the latter.

On the under side of the cross-head there is a shoe or a support J. This may be of any desired length. At present I prefer to ex-
35 tend it back somewhat over a distance approximately equal to that over which the holder can slide on the upper side of the bar D. This acts to prevent any disadvantageous down thrust from the holder either during or
40 after its being forced into the coal.

The manner of operating the devices above described will be readily understood. When the machine is in operation, the bed-frame is
45 securely fastened in position in front of the coal, the power is applied through the motor or engine, and by the latter the chain is caused to move around the frame D D', and at the same time the entire carriage is caused to ad-
50 vance, the result being that the cutters in the chain form a kerf, such as indicated in Figs. 2 and 4. The cutters project above and below sufficiently to form a clear space extend-
55 ing both above and below the cross-head and bar D. As the cutters and their frame advance into the kerf under the coal jerkings or strains are experienced by the frame, at least in some
60 coals. These, however, are seldom of importance until the carriage-frame has advanced four or five feet into the kerf, they being
mainly noticeable during the last foot or two of a seven-foot undercut. With a mechanism such as that herein as soon as the operator perceives that such jerkings or strainings of the carriage-frame are being caused by the

cutters he can move the lever F' in such way
65 as to rock its shaft F sufficiently to cause the pin E to be forced up into the coal. When this holder has been thrust into this position, it no longer advances with the carriage, but
70 remains stationary within the coal and serves the function of a "jack" situated at a point close to the cutter-chain, and being mounted in the plate I and connected to the collar or
75 sleeve G it holds the last said parts stationary with it. The carriage, with the bar D, continues to advance until the remaining one or two feet of the cut have been made. Then
80 the feed mechanism is reversed and the carriage withdrawn. The operator can at the time of reversing the feed immediately throw the lever F' in such way as to disengage the
85 holder E or can wait until the carriage has been retracted a short distance if he desires to steady it while it moves through that portion of its path. After the cutters have been
90 drawn entirely out from the coal the holder E and its carrier I can be moved back to their initial positions at the front of the carriage. This can be done by hand or automatically.
95 For the latter purpose a spring, such as at K, can be employed, bearing at one end against the holder or its carrier and at the other end against a stop or abutment. This spring not
100 only tends to return the holder and its carrier to their initial positions after the carriage has been withdrawn from the coal, but acts to hold them in such position when the carriage
105 is advancing into the kerf, when the holder is inactive. Hence it is possible with this construction to secure several holds upon the coal during any one cut, for if the operator should
110 find that the pin or bar at E has lost its hold because of the flaking down of the coal he can draw it downward and permit the spring K to advance it to a new position, when he
115 can again by the lever F' force it into the coal.

A device of this character not only puts the holding of the carriage under the control of the operator, but enables him to secure a more
120 positive hold than by any device within my knowledge. The holders of the earlier sort, which advance with the cutters and at a fixed distance therefrom, are subject to the vibra-
125 tions and motions of the frame, and if they depend upon the cutting of a groove the walls of the groove will be broken down and will vary from point to point, or if they depend upon friction-grip there is a liability of slip-
ping; but with a holder embodying the principle of action of that herein the bracing or
130 jacking action of the holder can be practically unlimited at the will of the operator, he having it in his power at any time to increase or lessen the penetration or grip of this device.

What I claim is—

1. In a mining-machine, the combination, of the bed, the carriage, the laterally-acting cutters on the carriage, the holding device

rigidly connected with the carriage laterally and adapted to be moved toward and from the carriage, and means for moving the holder device at will into and out of engagement with the coal, substantially as set forth.

2. In a mining-machine, the combination, of the bed, the carriage, the laterally-acting cutters on the carriage, the holding device rigidly connected with the carriage laterally and adapted to be moved vertically toward and from the coal, and the holder-operating devices extending to points outside of the kerf, and adapted to be moved to throw the holder into and out of engagement with the coal, substantially as set forth.

3. In a mining-machine, the combination, of the bed, the carriage, the laterally-acting cutters on the carriage, the holding device adapted to be moved into the kerf as it is being formed by the cutters without engaging with the coal, and means for moving the holding device into engagement with the coal after said holder has been carried sufficiently far into said kerf, substantially as set forth.

4. In a mining-machine, the combination, of the bed, the longitudinally-movable carriage, the laterally-acting cutters on the carriage, and a holding device supported by the carriage and adapted to engage with the coal and remain stationary in engagement with the coal while the carriage is advancing longitudinally, substantially as set forth.

5. In a mining-machine, the combination, of the bed, the carriage, the laterally-acting cutters on the carriage, the holding device sliding back and forth longitudinally on the carriage, and means for causing the holding device at will to engage with the coal, substantially as set forth.

6. In a mining-machine, the combination, of the bed, the carriage, the laterally-acting cutters on the carriage, a feed mechanism, the holding device on the carriage independent of the feed mechanism and adapted to be moved toward and from the carriage, and means for moving the holder device at will into and out of engagement with the coal, substantially as set forth.

7. In a mining-machine, the combination, of the bed, the carriage, the laterally-acting cutters on the carriage, a feed mechanism, the holding device on the carriage independent of

the feed mechanism and adapted to be moved vertically toward and from the coal, and the holder-operating devices extending to points outside of the kerf, and adapted to be moved to throw the holder into and out of engagement with the coal, substantially as set forth.

8. In a mining-machine, the combination, of the bed, the longitudinally-movable carriage, the laterally-acting cutters on the carriage, a feed mechanism for the carriage, the holding device independent of the feed mechanism and adapted to be moved into the kerf formed by the cutters without engaging with the coal, and means for moving the holding device into engagement with the coal after said holder has been carried into said kerf, substantially as set forth.

9. In a mining-machine, the combination, of the bed, the carriage, the laterally-acting cutters on the carriage, a feed mechanism for the carriage, and a holding device independent of the feed mechanism and supported by the carriage and adapted to engage with the coal and remain stationary while the carriage is advancing, substantially as set forth.

10. In a mining-machine, the combination, of the bed, the carriage, the laterally-acting cutters on the carriage, a feed mechanism, the holding device independent of the feed mechanism sliding back and forth longitudinally on the carriage, and means for causing the holding device at will to engage with the coal, substantially as set forth.

11. In a mining-machine, the combination, of a bed, a carriage, cutters on the said carriage, a holding device on the carriage and movable therewith in the kerf as it is being formed by the cutters when in its disengaged position, mechanism for operating said holding device and means for operating the cutters, said carriages being forwardly movable independent of said holding device, and independent of said operating mechanism when the holding device is in its engaged position, substantially as set forth.

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

HENRY B. DIERDORFF.

Witnesses:

RYROS HUTCHINS,
R. H. JEFFREY.