

No. 630,388.

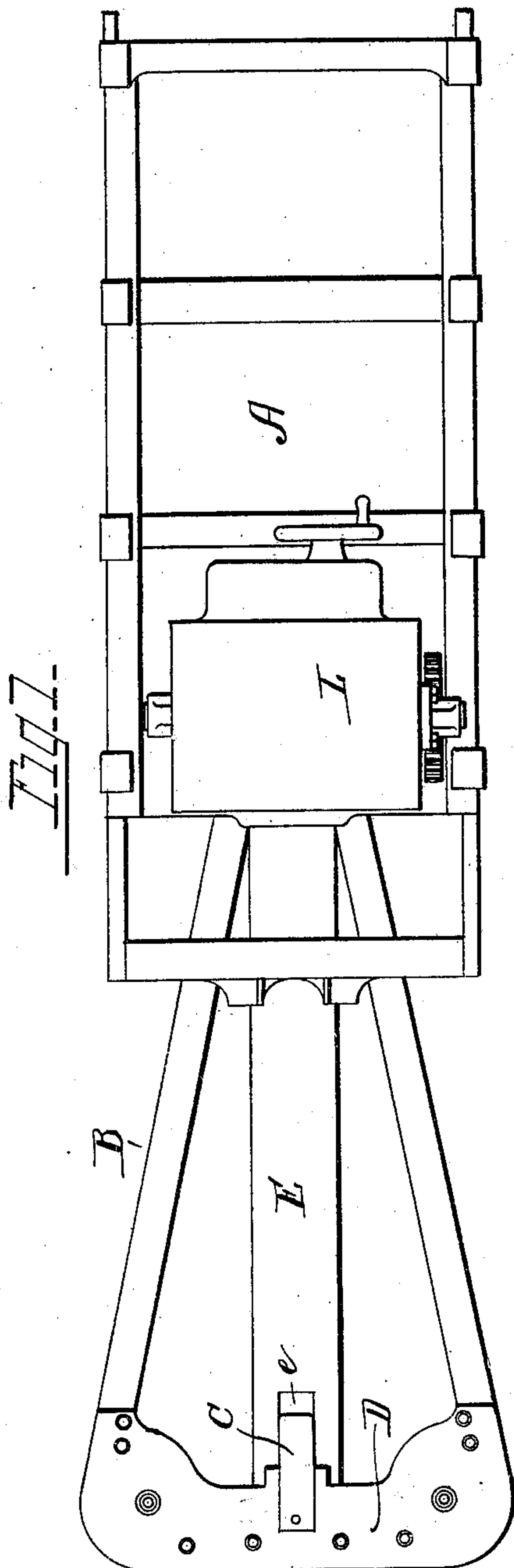
Patented Aug. 8, 1899.

C. W. MILLER.  
MINING MACHINE.

(Application filed Nov. 20, 1896. Renewed Jan. 6, 1899.)

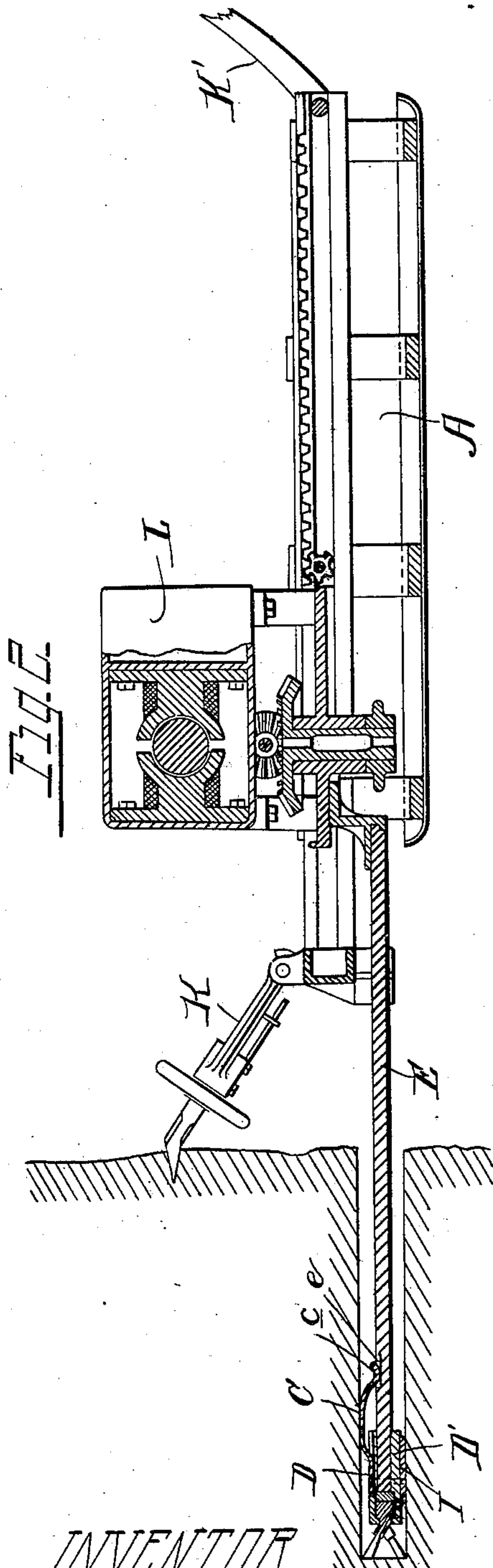
(No Model.)

3 Sheets—Sheet 1.



WITNESSES

Carroll J. Webster  
Arthur L. Bryant



INVENTOR  
Charles H. Miller  
By J. H. Bliss  
att'y

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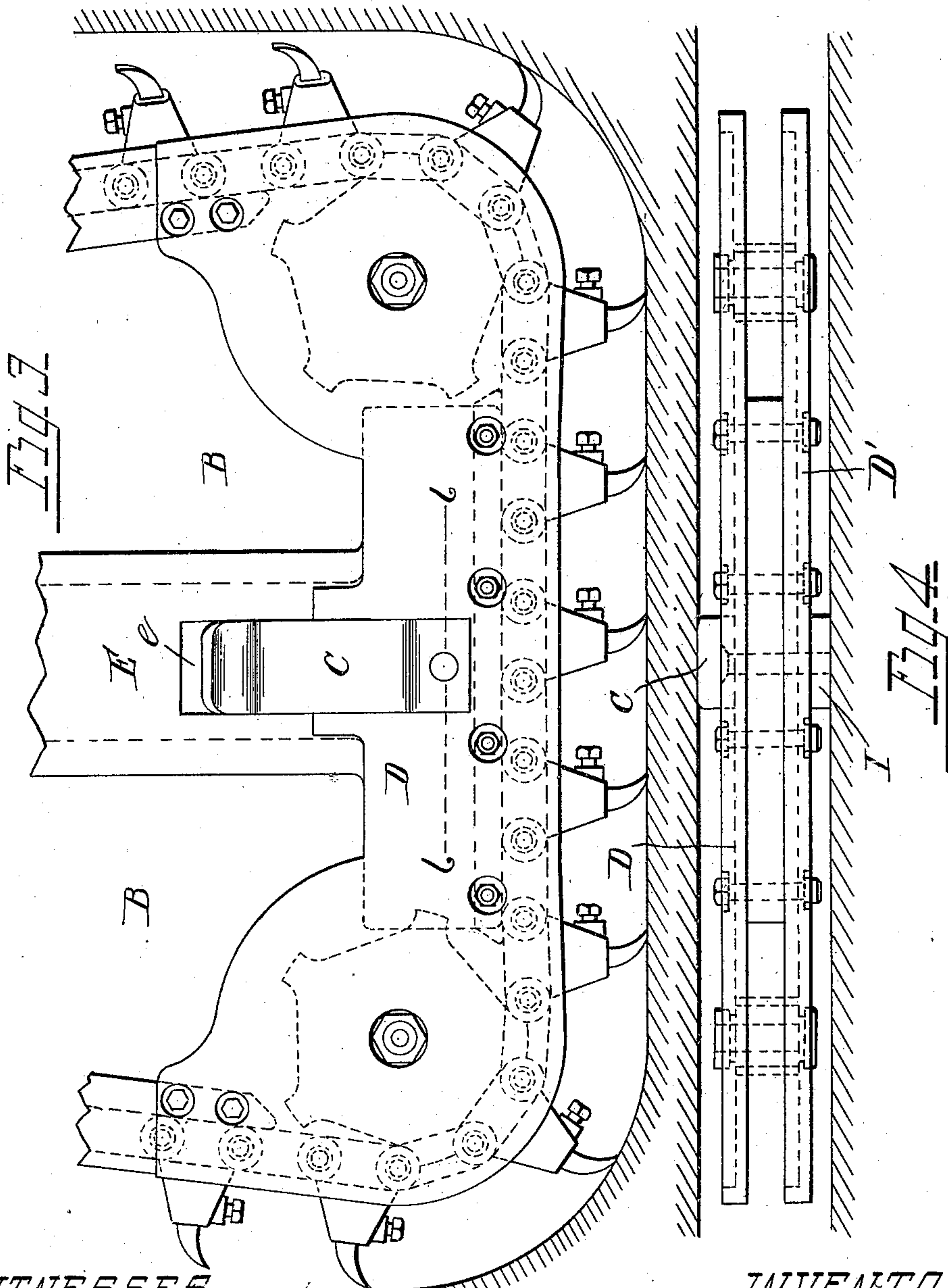
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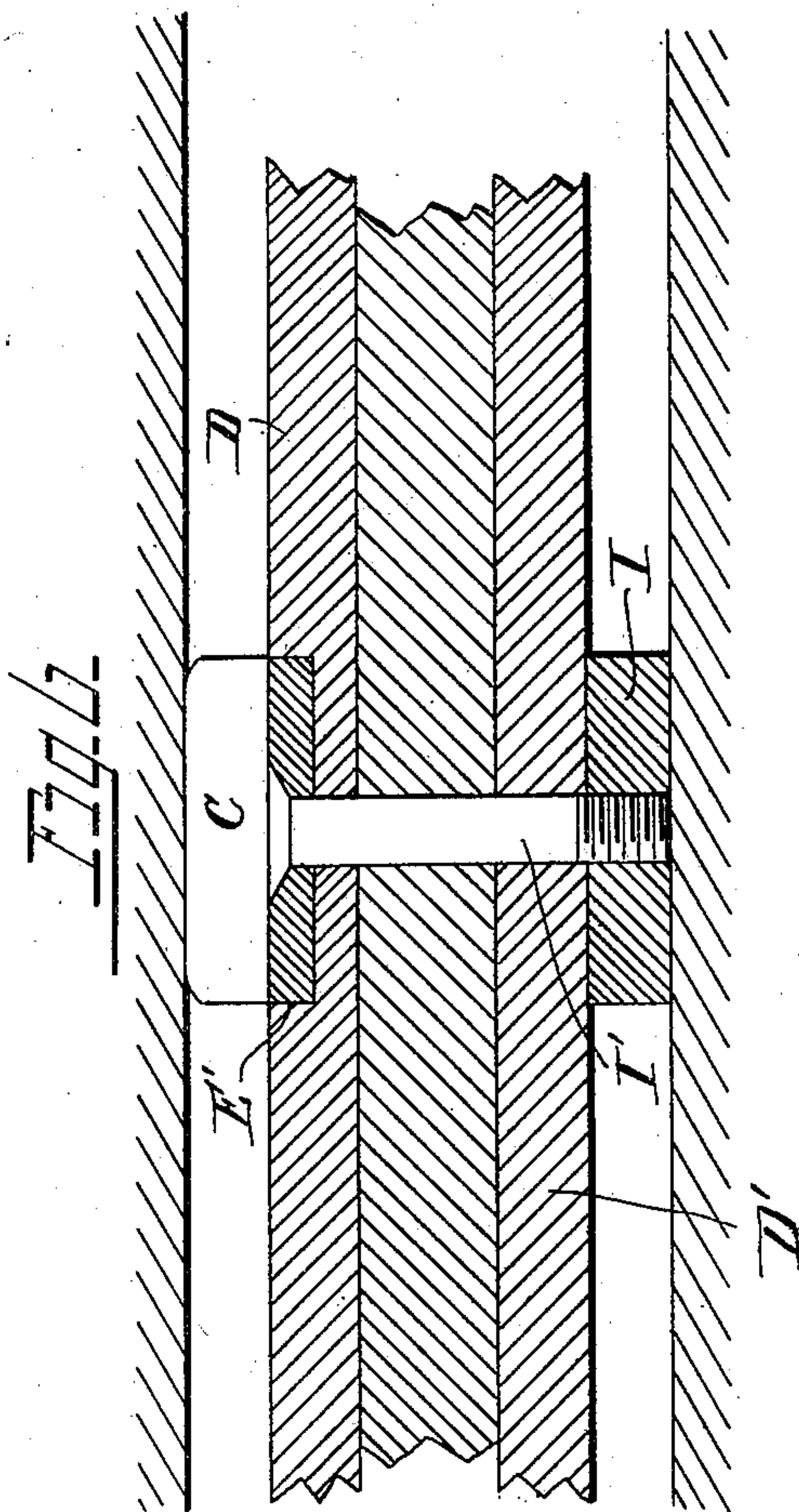
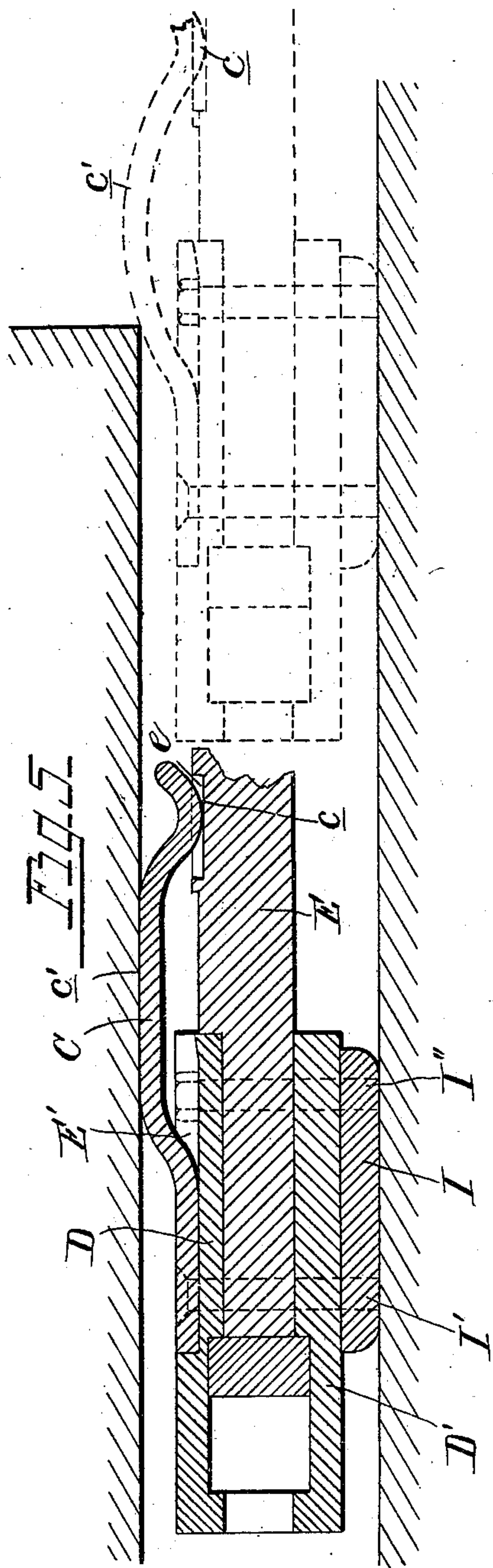
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# UNITED STATES PATENT OFFICE.

CHARLES W. MILLER, OF COLUMBUS, OHIO, ASSIGNOR TO JOSEPH A. JEFFREY, OF SAME PLACE.

## MINING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 630,388, dated August 8, 1899.

Application filed November 20, 1896. Renewed January 6, 1899. Serial No. 701,409. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES W. MILLER, 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 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Figure 1 is a plan view illustrating more or less conventionally one form of machine having my improvements applied thereto. Fig. 2 is a central vertical longitudinal section of the same. Fig. 3 is a plan view, on an enlarged scale, of the forward end of the movable carriage. Fig. 4 is a front end view of the same. Fig. 5 is a longitudinal sectional view, on an enlarged scale, of the forward portion of said carriage, illustrating in dotted lines the position of my improved holding device prior to entering the kerf and in full lines the position of said holder after it has passed into the kerf. Fig. 6 is a sectional view on the line 6 6 of Fig. 3.

In the drawings I have shown my invention as being applied to a mining-machine of the class in which each has an endless chain to which are attached cutters.

A indicates as a whole a bed-frame, and B indicates a sliding carriage or movable frame. The latter is arranged in guideways on the bed and can be fed forward or drawn backward by means of the power devices, which are generally mounted upon the rear part of the sliding frame or carriage.

When machines of this class are in operation, more or less difficulty is experienced from the fact that as the cutters are carried through the coal by the endless chain they exert a reactionary force upon the carriage and bed-frame in the direction opposite to that in which the chain is moved. This causes not only straining of the parts of the framework, but also acts frequently to cause more or less of the machine to move bodily in the

direction opposite to that in which the cutters are moving. Numerous means have been devised and proposed for overcoming the effect of this reactionary thrust or force, such as augers having their bits placed near the transverse vertical plane of the operative cutters, reciprocating picks placed near the same position, cutter-disks, &c. In Patent No. 548,970, dated October 29, 1895, to H. B. Dierdorff, there is shown and described one form of holding device. In that case the holder was advanced under pressure with the carriage, it being thrust directly against the coal. The back pressure was one of the principal factors depended upon for preventing the lateral strain or displacement of the machine. When the coal is hard or contains hard substances, the pressure to force such cutter through becomes sometimes more severe than is desirable. To overcome this and to provide the machines with holders suitable for such conditions, use has been made of a rotatable toothed wheel, the points of which were adapted to penetrate slightly into one of the horizontal walls of the chain-kerf, and while this under many circumstances is a desirable and efficient device at the same time it has been found that with some species of coal the points may impinge upon layers of refractory material, and when this occurs there is a vertical pressure on the lines through the active point and the shoe below the cross-head. Another device which has been used for this purpose consisted of a pressure-block placed upon the top of the cutter-head, it having recesses on its under side wherein were seated rubber blocks. This device is necessarily somewhat expensive in construction and is not readily adjustable with respect to the tension exerted upon the metal by the resilient parts, as is desirable under many circumstances. To meet such circumstances, I have devised the present form of holder, which acts upon a principle differing from that of either of those above referred to. I avoid the expenditure of power required to form a groove or channel for the passage of a holder and avoid the liability to have a vertical pressure beyond a desired limit produced at any time. I employ a holder which shall have



frictional engagement with one of the horizontal walls of the main kerf, it being formed of an elastic plate or bar which at one point is fixed in relation to the carriage and at  
 5 other points is adapted to slip or move longitudinally of the carriage, so that the active frictional part thereof can rise or be depressed, as occasion may require. It is relatively prolonged, so that an elongated active  
 10 surface can be provided and so that a yielding action within remote limits can be allowed for.

In the drawings, C indicates the holding device. It is formed of a strong piece of spring-steel, preferably curved longitudinally into  
 15 the form shown, and has its forward end extending into a socket or cavity E', formed in the top plate of the front cross-head D in line with the central push-bar E. The rear end of the holder C is preferably curved upward  
 20 slightly to form a curved surface c, which rides along the upper surface of the said push-bar E. Preferably the movable part, as the curved portion at c, is arranged to bear against an abutment. This may be provided  
 25 by forming a cavity or depression e in the top surface of the push-bar, the walls of which serve as shoulders or abutments to relieve the fixed end of the holder of strain. I avoid limiting the free vertical movement of the  
 30 central bowed part c', the curved surface c permitting the free end of the holder to move longitudinally of the push-bar E, according as the bowed part c' rises or falls. The bowed  
 35 part c' of the holder is of such size as to project some distance above the front cross-head D and the push-bar E, and when the front cross-head has advanced into the kerf sufficiently far to bring said holder into position  
 40 for action the pressure exerted by the top horizontal wall of the kerf causes said holder to occupy the position indicated in full lines in Fig. 5, its position prior to entering the kerf being shown in dotted lines in the same figure.

45 At I there is a shoe below the cutter-head D. This is so related in its dimensions as to not only support the front end of the carriage against sagging under the influence of gravity as it advances farther and farther from  
 50 the bed-frame, but also so as to insure that the holder C will be compressed and held firmly against its opposing wall of the chain-kerf. In the drawings I have shown this shoe I as secured in place by two vertical bolts  
 55 I' I', that at I' serving also to connect the holder C to the carriage.

60 K K' designate the front and rear jacks, respectively, they being secured to the bed-frame A in the ordinary manner and adapted to engage with the vertical walls of the room, being cut in the ordinary manner.

Any desired and suitable mechanism for advancing the carriage into and withdrawing it from the coal may be employed, it being  
 65 adapted to be actuated from the motor or engine conventionally illustrated at L, and the

devices for driving the endless cutter-chain are also actuated by the motor or engine L, as is common in the class of machines to which  
 70 my present improvements relate.

The operation of and the advantages incident to the improvements above described will be readily understood and appreciated by those skilled in the art to which they relate. As the carriage is advanced the holder  
 75 C will be, by engagement with the upper wall of the chain-kerf, pressed downwardly from the position illustrated in dotted lines in Fig. 5 to that shown in full lines in said figure and in Fig. 2, and the strength of the holder is  
 80 such that it will press with sufficient force against the wall of the kerf to prevent any side or lateral movement of the carriage under the reactionary thrust or force exerted by the chain. The jacks K K' being firmly in  
 85 proper position, the greater part of the lateral strain caused by the cutters at the front of the carriage is overcome by them; but in addition to what may be regarded as the general strain (which is taken by the jacks) there are  
 90 frequently short snap-like jerks or pulls, due to the action of a cutter which is slightly longer or duller than the others, and in a properly-constructed machine it is the effects  
 95 of the latter action which should be overcome by a holder at the front of the carriage. A friction-holder of the character herein described is sufficient to accomplish this, although at the same time the holding action  
 100 of the parts C and I is not of such a nature as to unduly resist the advance of the carriage. The holder will act with uniform pressure at all points, it yielding readily in either direction to accommodate itself to any irregularities in the surface against which it is  
 105 acting.

While I have above shown and at present prefer to place the holder C above the carriage and arrange the shoe I directly beneath  
 110 the same, there can be modifications in the arrangement of parts, if desired. Instead of making the shoe I detachable one or more integral ribs may be formed on the bottom plate D' of the carriage-head D.

I do not claim any of the features of invention appearing in the application of H. B. Dierdorff, Serial No. 558,765, filed August 9,  
 115 1895.

What I claim is—

1. In a mining-machine, the combination  
 120 with a bed-frame, adapted to be made stationary, a carriage mounted on said bed and movable longitudinally thereof, an endless cutter-chain supported on the carriage, and means for moving the carriage longitudinally  
 125 of the bed and for actuating said cutter-chain, of a vertically-yielding holder, C, consisting of an elastic plate having one end secured to the front cross-head of the carriage, an intermediate curved or bowed portion, c', adapted  
 130 to contact with the adjacent horizontal wall of the kerf formed by the cutter-chain,



and having an oppositely-curved end portion *c*, bearing upon the carriage and sliding longitudinally thereof, substantially as set forth.

2. In a mining-machine, the combination  
5 with a bed-frame adapted to be made stationary, a carriage, a cutter-chain supported on the carriage, and means for moving the carriage longitudinally of the bed and for actuating the cutter-chain, of a holder, for preventing lateral movement of the carriage, it  
10 consisting of an elastic bar or plate of spring metal having one end rigidly secured to the carriage, an intermediate curved or bowed portion, *c'*, adapted to contact with one of the  
15 horizontal walls of the kerf formed by the cutter-chain, and a free end bearing on and sliding longitudinally of the carriage and an abutment for the side of said holder-plate, substantially as set forth.

20 3. In a mining-machine, the combination with a bed-frame, adapted to be made stationary, a carriage, mounted on said bed and movable longitudinally thereof, an endless cutter-chain supported on the carriage, and  
25 means for moving the carriage longitudinally of the bed and for actuating said cutter-chain, of a vertically-yielding holder, *C*, consisting

of an elastic plate having one end secured to the front cross-head of the carriage, an intermediate curved or bowed portion, *c'*, adapted to contact with the adjacent horizontal  
30 wall of the kerf formed by the cutter-chain, and having an oppositely-curved end portion *c*, bearing upon the carriage and sliding longitudinally thereof, and means bearing against  
35 the opposite wall of the chain-kerf to relieve the carriage of displacing pressure, substantially as set forth.

4. In a mining-machine, the combination of the carriage, the cutter-chain supported  
40 on the carriage, the shoe or support on the under side of the carriage, and the holding-spring on the upper side of the carriage, said spring being formed of an elastic piece of metal having an end loose to slide or move  
45 longitudinally and a vertically-movable coal-engaging portion between its ends, substantially as set forth.

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

CHARLES W. MILLER.

Witnesses:

A. D. SHAW,  
C. A. DODDS.