

(No Model.)

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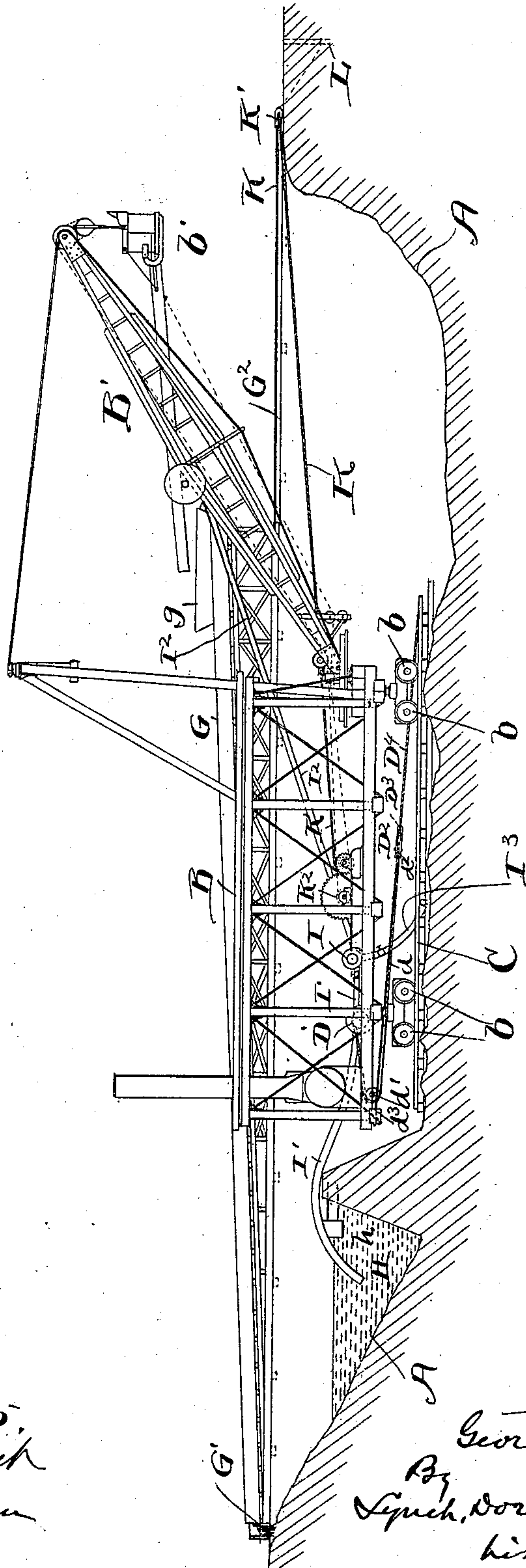
G. W. KING.

ART OF EXCAVATING MINERAL BEARING EARTH.

No. 576,857.

Patented Feb. 9, 1897.

Fig. 1.



Witnesses:
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Inventor:
George W. King
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Lynch, Dorer & Donnelly
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(No Model.)

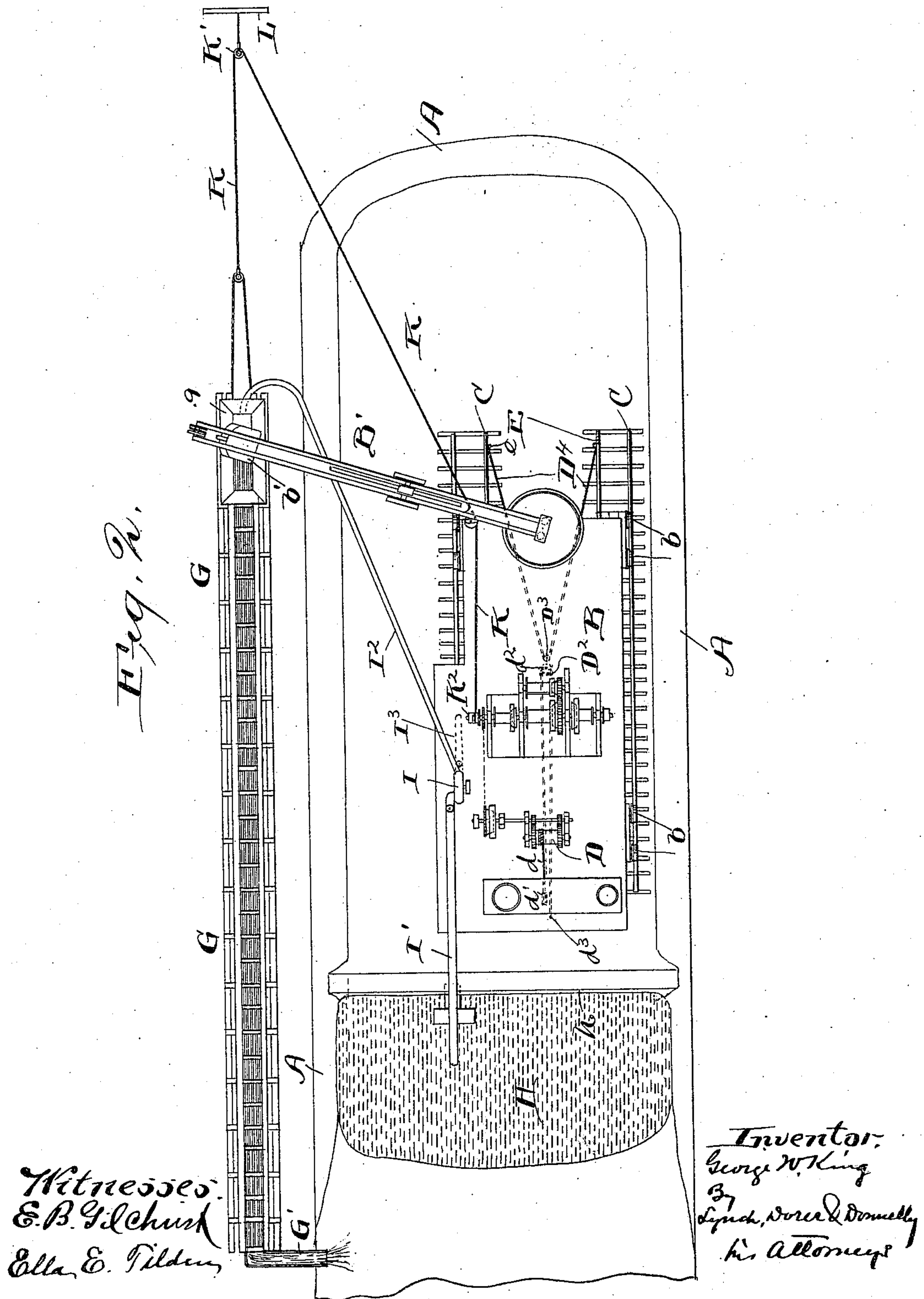
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Fig. 3.

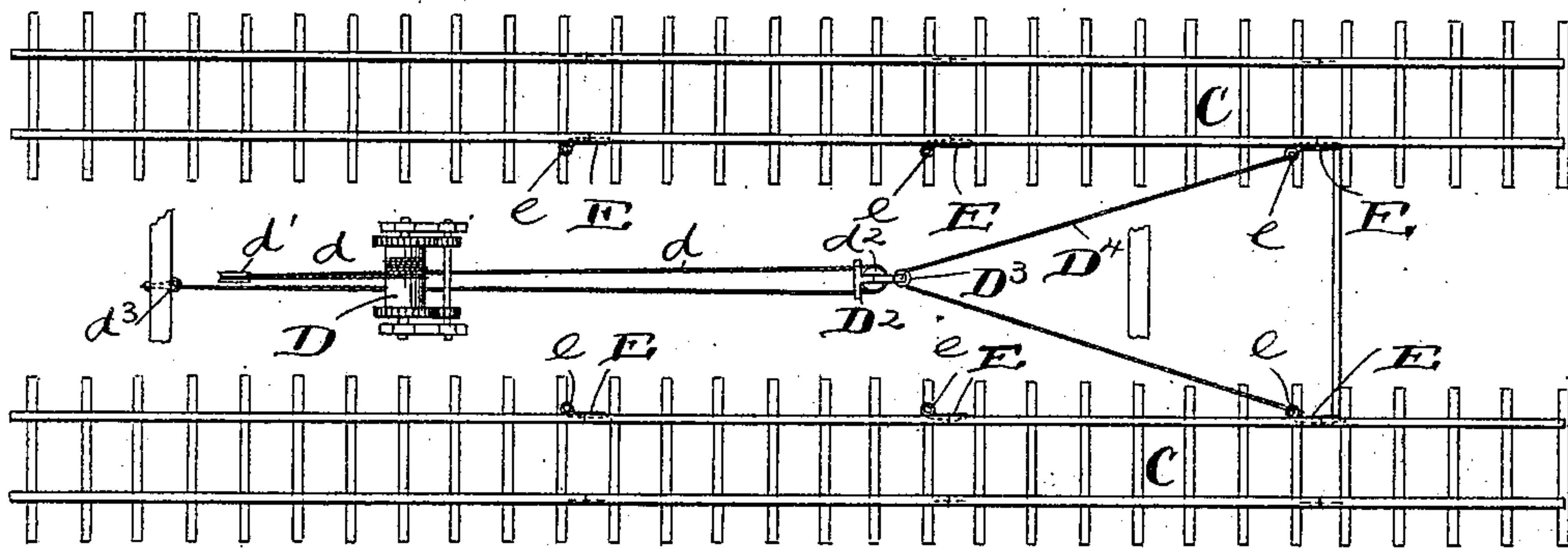
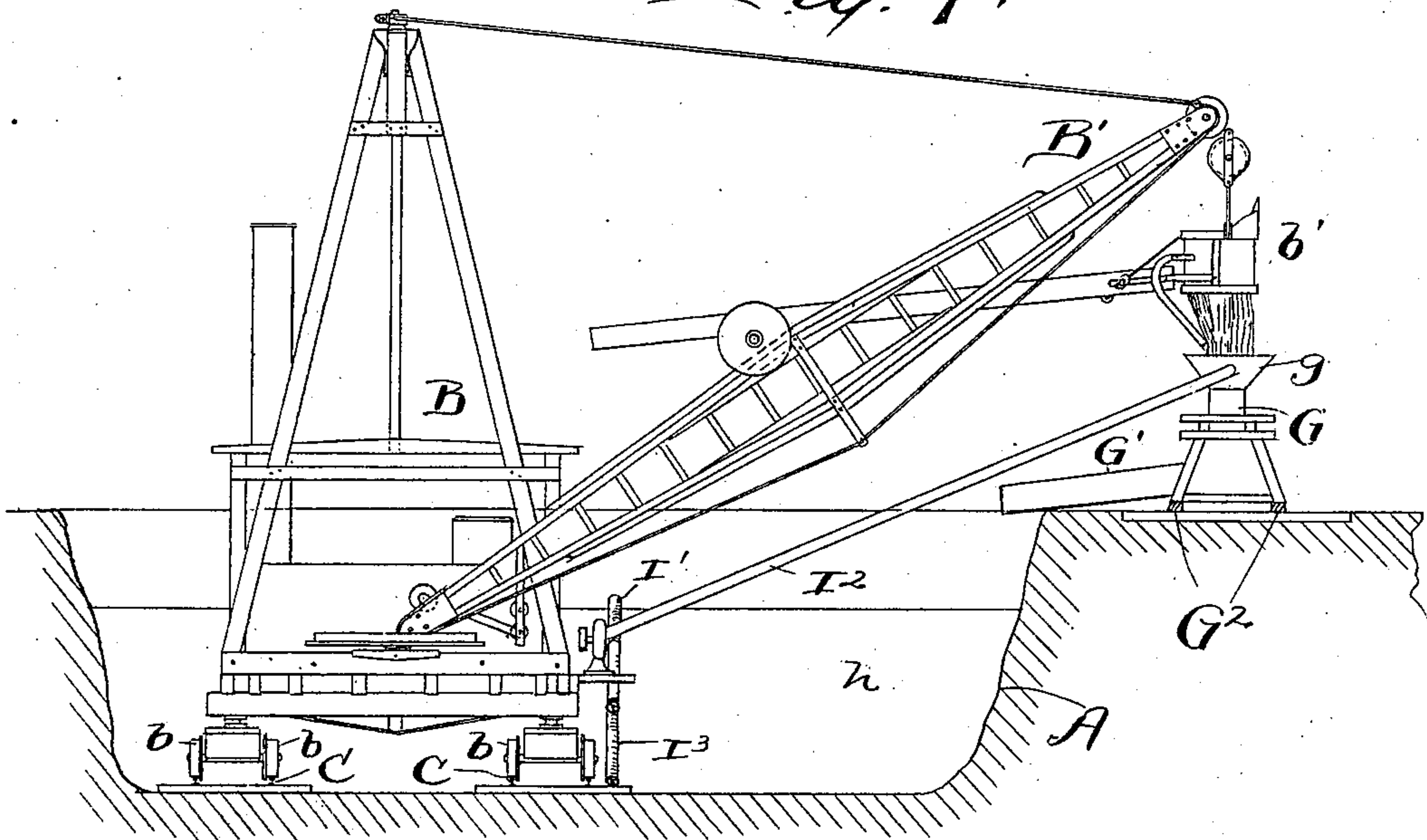


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE W. KING, OF MARION, OHIO.

ART OF EXCAVATING MINERAL-BEARING EARTHS.

SPECIFICATION forming part of Letters Patent No. 576,857, dated February 9, 1897.

Application filed August 7, 1896. Serial No. 601,958. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. KING, of Marion, Marion county, Ohio, have invented certain new and useful Improvements in the
5 Art of Excavating Mineral-Bearing Earths; 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 pertains to make and use
10 the same.

My invention relates to improvements in the art of excavating mineral-bearing earth.

The invention consists, among other things, in an excavator provided with a sluice-box
15 arranged to receive the mineral-bearing earth from the shovel or dipper of the excavator and to deposit the waste material in the cut made by the excavator.

The invention consists also in the combination, with the excavator and the sluice-box arranged alongside and movable longitudinally of the cut made by the excavator, of a dam constructed within the cut between the rear end of the excavator and the cut's rear
25 end, so as to form an artificial water-basin and suitable means for conveying water from said basin to the sluice-box.

My invention consists, furthermore, in the combination, with the excavator and the sluice-box, of a suitably-operated winding-drum carried by the excavator and a suitably-actuated cable operatively connected with
30 said winding-drum and sluice-box and so arranged that the sluice-box can be moved longitudinally in the direction of the forward end of the cut upon advancing the excavator within the cut.

The invention consists, furthermore, in the employment of a suitably-actuated cable for propelling the machine forwardly and fastened to the track upon which the excavator is mounted at or near the excavator's forward end and leading over suitably-arranged pulleys and fastened to the excavator's body
45 portion at or near the latter's rear end.

The invention consists, moreover, in certain novel and meritorious features of construction and combinations of parts hereinafter described, and pointed out in the claims.

50 In the accompanying drawings, Figure 1 is a side elevation of the excavator and shows the cut made by the excavator in central longitudinal section. Fig. 2 is a top plan showing the excavator within the cut made by it,

the sluice-box arranged alongside of said cut, 55 the artificial water-basin formed within said cut rearward of the excavator, the means for conveying water from said basin to the sluice-box, the means for moving the sluice-box forwardly, and the means for advancing the excavator within the cut. Fig. 3 is a top plan 60 of the rail upon which the excavator is mounted and the means instrumental in propelling the excavator forwardly. Fig. 4 is a front elevation of the excavator within the cut made 65 by it and shows the laterally-swinging shovel-bearing boom of the machine swung laterally to the side of the cut at which the sluice-box is located and exhibits the excavating-shovel in position discharging into a hopper with 70 which the forward end of the sluice-box is provided.

Referring to the drawings, A designates the cut made by the excavator; B, the steam shovel or excavator, provided with any suitable number of trucks *b*, whose wheels engage the rails C of a track or tracks built upon the bottom and arranged longitudinally of the cut made by the excavator. The excavator is provided at its forward end in the 80 usual manner in the case of the machines of the character indicated with a suitably-actuated laterally-swinging boom B', that is provided with a suitably-operated excavating-shovel *b'*. 85

The improved means instrumental in effecting the forward movement of the excavator comprises a suitably-actuated winding-drum D, suitably supported, in the case illustrated, from the excavator's body portion near the latter's rear end, and a cable *d*, that operatively engages said drum, leads rearwardly from the drum to and over a guide-sheave *d'*, arranged vertically and longitudinally of the machine's body portion and supported from the latter's 95 rear end, thence leads forwardly below the floor of the machine's body portion to and over the sheave *d*² of a sheave-block D², suitably supported a suitable distance forward of the aforesaid winding-drum, and thence leads 100 rearwardly to the body portion's rear end, to which it is securely fastened at *d*³. It is obvious that the winding of cable *d* upon drum D in the direction required to effect a forward pull upon the rear end of the excavator 105 will propel the machine forwardly. Sheave-block D² is provided at its forward end with another sheave D³, and a cable D⁴ leads over

said sheave D^3 and has its ends fastened to two different rails C C, respectively, below the forward end of the machine. Cable or connection D^4 is secured, preferably, to the eye e of a fish-plate or fish-plates E, that are instrumental in forming the joints of the rails. The fastening of cable or member D^4 to the rails at or near the forward end of the excavator's body portion is important, because the weight of the machine upon the rails at the body portion's forward end affords an efficient anchorage. The rails upon which the excavator is mounted are provided with any suitable number of fish-plates E, distributed at suitable intervals along the rails as they are laid, and member D^4 is carried forward and fastened to fish-plates located farther forwardly when the machine has been moved forwardly.

A rearwardly-declining sluice-box G is provided at one side and outside of the cut A, made by the excavator. Sluice-box G is arranged longitudinally and preferably parallel with the cut and is movable longitudinally. The sluice-box, at its forward end, is provided with a hopper g , that at the bottom is in open relation with the passage-way through the box and is so arranged relative to the laterally-swinging boom of the excavator that the excavating-shovel upon swinging the boom laterally over to the receiving end of the sluice-box shall be in position for discharging into the forward end or hopper of the sluice-box, as shown in Figs. 2 and 4. It will be observed, therefore, that the excavated mineral-bearing earth is dumped or deposited into the hopper or receiving end of the sluice-box, and there it is subject to a strong current of water and carried down the sluice-box and deposited in the cut a suitable distance back of the excavator.

The sluice-box, of course, extends a suitable distance rearward of the excavator and at its rear end is provided with a discharge pipe or duct G' , projecting laterally of the sluice-box and inwardly and arranged to discharge into the cut made by the excavator. The heavy or solid waste material settles in this cut, while the water will find its way by gravity to the basin II, that is suitably constructed rearward of the excavator within the cut. Basin H is formed, preferably, by constructing the dam h just rearward of the rear end of the excavator and across the cut made by the excavator. Water is taken from the basin H through the suction hose or pipe I' of a suitably-operated pump I, that is suitably supported from the excavator's body portion, and the delivery-pipe or discharge-pipe I^2 of said pump extends to and discharges into the receiving end of the sluice-box. The sluice-box has ways G^2 and is drawn forwardly as the excavation advances by means of a suitably-actuated cable K, that is operatively connected with the sluice-box in any approved manner and leads from said box forwardly to and over a guide-sheave K' , that is suitably

connected with an anchor L, secured within the ground, and thence leads rearwardly to and into operative engagement with a suitably-operated winding-drum K^2 , suitably supported upon the excavator's body portion. The sluice-box, it will be observed, therefore forms really a part of the excavator. It will also be observed that with an excavator of the character indicated material can be washed in localities where the supply of water is limited by using the water over and over again, and the deposition of the waste rearward of the excavator in the cut made by the excavator is accommodated.

Pump I is provided, preferably, with another suction pipe or hose I^3 , arranged to take water from the bottom of the cut made by the excavator when the machine is used in a locality where there is a large quantity of water in the earth and where the water seeps in rapidly and has a tendency to fill up the excavation made. When the seepage is large enough to furnish a sufficient quantity of water for the separation of the gold or mineral from the mineral-bearing earth under treatment, basin II is not necessary, but when this source of water-supply is not sufficient said basin, of course, is required. It is well known by miners that in the excavation of gold-bearing dirt from beneath the surface of water a large portion of the gold is lost, as it rapidly settles to the bottom. By my improved machine, however, any water seeping into the pit or cut is readily removed and used beneficially, and the loss of gold is reduced to a minimum.

What I claim is—

1. In combination, an excavator of the character indicated, arranged within and movable longitudinally of the cut made by it and provided with a pump; a sluice-box arranged alongside and outside of the cut, and having its receiving end arranged to receive the material from the excavator's bucket; a source of water-supply; a suction hose or pipe connecting said water-supply source with the aforesaid pump, and a passage-way for conducting the pumped water from the pump into the receiving end of the sluice-box, substantially as set forth.

2. In combination, an excavator of the character indicated arranged within and movable longitudinally of the cut made by it and provided with a pump; a water-basin formed within the cut rearward of the excavator; a rearwardly-declining sluice-box arranged alongside of and outside of the cut, said box having its receiving end arranged to receive the material from the excavator's bucket and provided, at its rear end, with a discharge-pipe or passage-way arranged to discharge into the cut rearward of the basin; a suction-hose or passage-way for conducting water from the basin to the pump, and a pipe or passage-way for conducting water from the pump into the receiving end of the sluice-box, substantially as and for the purpose set forth.

3. In combination, an excavator of the character indicated arranged within and movable longitudinally of the cut made by it and provided with a pump; a dam formed within and extending widthwise of the cut near the rear end of the excavator; a rearwardly-declining sluice-box arranged alongside of and outside of the cut, said box having its receiving end arranged to receive the material from the excavator's bucket and provided, at its rear end, with a laterally and inwardly extending discharge-pipe or passage-way arranged to discharge a suitable distance rearward of the aforesaid dam; a hose or passage-way extending from within the basin formed at the rear of the dam to the pump, and a pipe or passage-way for conducting water from the pump into the receiving end of the sluice-box, substantially as set forth.

4. In combination, an excavator of the character indicated arranged within and longitudinally of the cut made by it, and provided with a suitably-operated winding-drum; a sluice-box arranged alongside of and outside of the cut, said box being movable longitudinally of the cut and having its receiving end arranged to receive the material from the excavator's bucket, and a suitably-guided cable operatively engaging the aforesaid drum and operatively connected with the sluice-box, substantially as and for the purpose set forth.

5. In combination, an excavator of the character indicated arranged within and longitudinally of the cut made by it and provided with a suitably-operated winding-drum; a sluice-box arranged alongside of and outside of the cut, said box being movable longitudinally of the cut and having its receiving end arranged to receive the material from the excavator's bucket; a relatively stationary sheave located a suitable distance forward of the sluice-box, and a cable operatively connected at one end with said box's forward end and thence leading forwardly to and over the aforesaid sheave and thence rearwardly to and operatively engaging the aforesaid winding-drum, substantially as and for the purpose set forth.

6. In combination, an excavator arranged within and movable longitudinally of the cut made by it, and provided with a pump whose suction hose or pipe has its receiving end arranged to take water from the bottom of the cut in which the excavator stands; a sluice-box arranged alongside of and outside of the cut, said box having its receiving end arranged to receive material from the excavator's bucket, and a pipe or passage-way for conducting the pumped water from the pump into the receiving end of said box, substantially as and for the purpose set forth.

7. In combination, an excavator mounted upon rails arranged longitudinally of the cut made by the excavator; a suitably-operated winding-drum suitably supported from the excavator's body portion; a sheave suitably supported from the machine rearward of the

drum; a relatively stationary sheave suitably supported a suitable distance forwardly; a cable operatively engaging the drum, thence extending rearwardly over the rear sheave, thence forwardly over the forward sheave, and thence rearwardly to the aforesaid body portion's rear end to which it is suitably secured, substantially as and for the purpose set forth.

8. In combination, an excavator mounted upon rails arranged longitudinally of the cut made by the excavator; a suitably-operated winding-drum suitably supported from the excavator's body portion; a sheave suitably supported from the machine rearward of the drum; a sheave-block a suitable distance forward of said sheave and connected with any suitable number of the aforesaid rails; a cable operatively engaging the drum, thence extending rearwardly over the rear sheave, thence forwardly over the sheave of said sheave-block, and thence rearwardly to the aforesaid body portion's rear end to which it is suitably secured, substantially as and for the purpose set forth.

9. In combination, an excavator mounted upon rails arranged longitudinally of the cut made by the excavator; a suitably-operated winding-drum suitably supported from the excavator's body portion; a sheave suitably supported from the machine rearward of the drum; a sheave-block a suitable distance forward of said sheave; a cable operatively engaging the drum, thence extending rearwardly over the rear sheave, thence forwardly over the sheave of said sheave-block, and thence rearwardly to the aforesaid body portion's rear end to which it is suitably secured; a fish-plate or fish-plates instrumental in forming a joint in the aforesaid rail or rails forward of said sheave-block, and provided with an eye, and a connection between said eye and said sheave-block, substantially as set forth.

10. In combination, an excavator mounted upon rails arranged longitudinally of the cut made by the excavator; a suitably-operated winding-drum suitably supported from the machine; a sheave suitably supported from the rear portion of the machine and rearward of said drum; a sheave-block a suitable distance forward of said sheave; a cable operatively engaging the drum, thence extending rearwardly over said sheave, thence forwardly to and over the sheave of the sheave-block, and a member connecting said block with a rail or rails at or near the forward end of the machine's body portion, substantially as and for the purpose set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 30th day of June, 1896.

GEORGE W. KING.

Witnesses:

A. E. CHENEY,
FRANK H. KING.