

C. L. HOPKINS.
EXCAVATING APPARATUS.
APPLICATION FILED APR. 13, 1909.

963,563.

Patented July 5, 1910.

2 SHEETS—SHEET 1.

Fig. 1

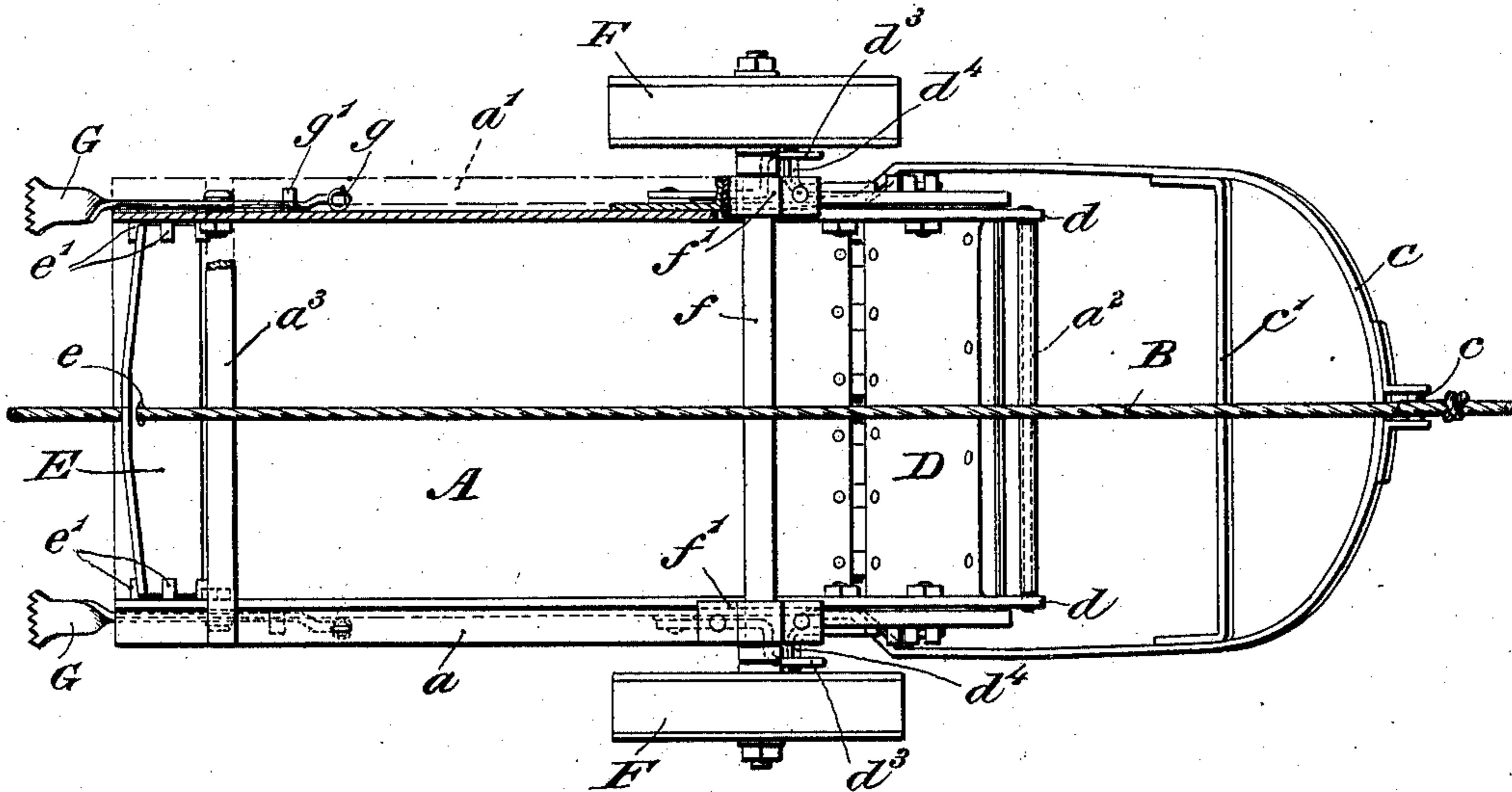
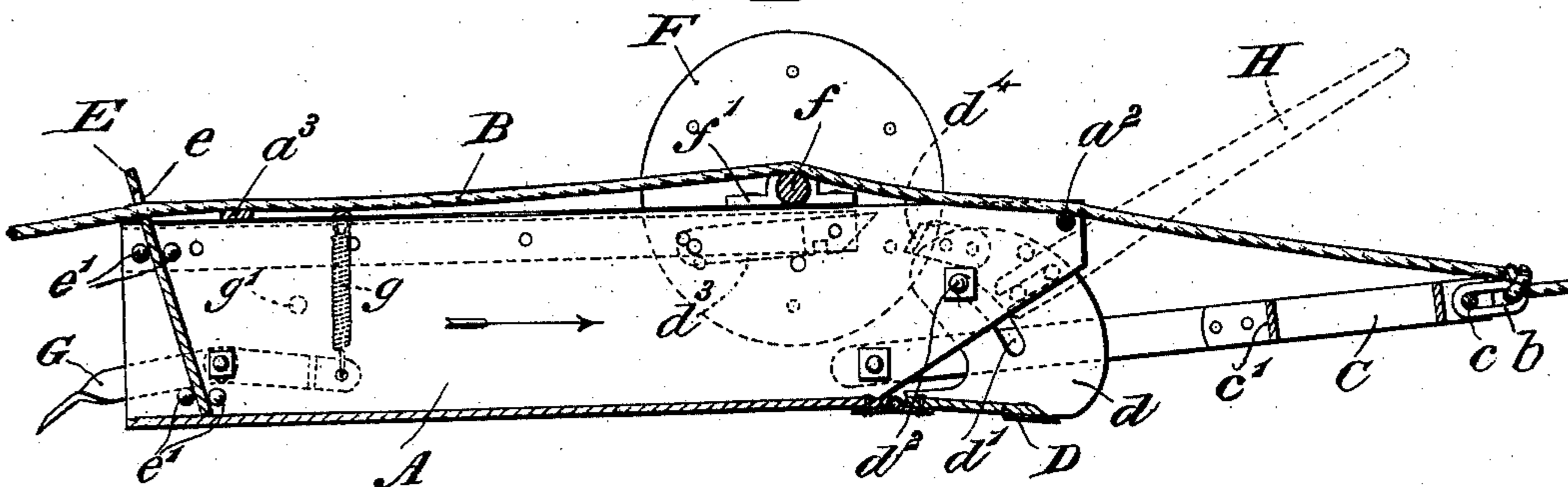


Fig. 2



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2 SHEETS—SHEET 2.

Fig. 3.

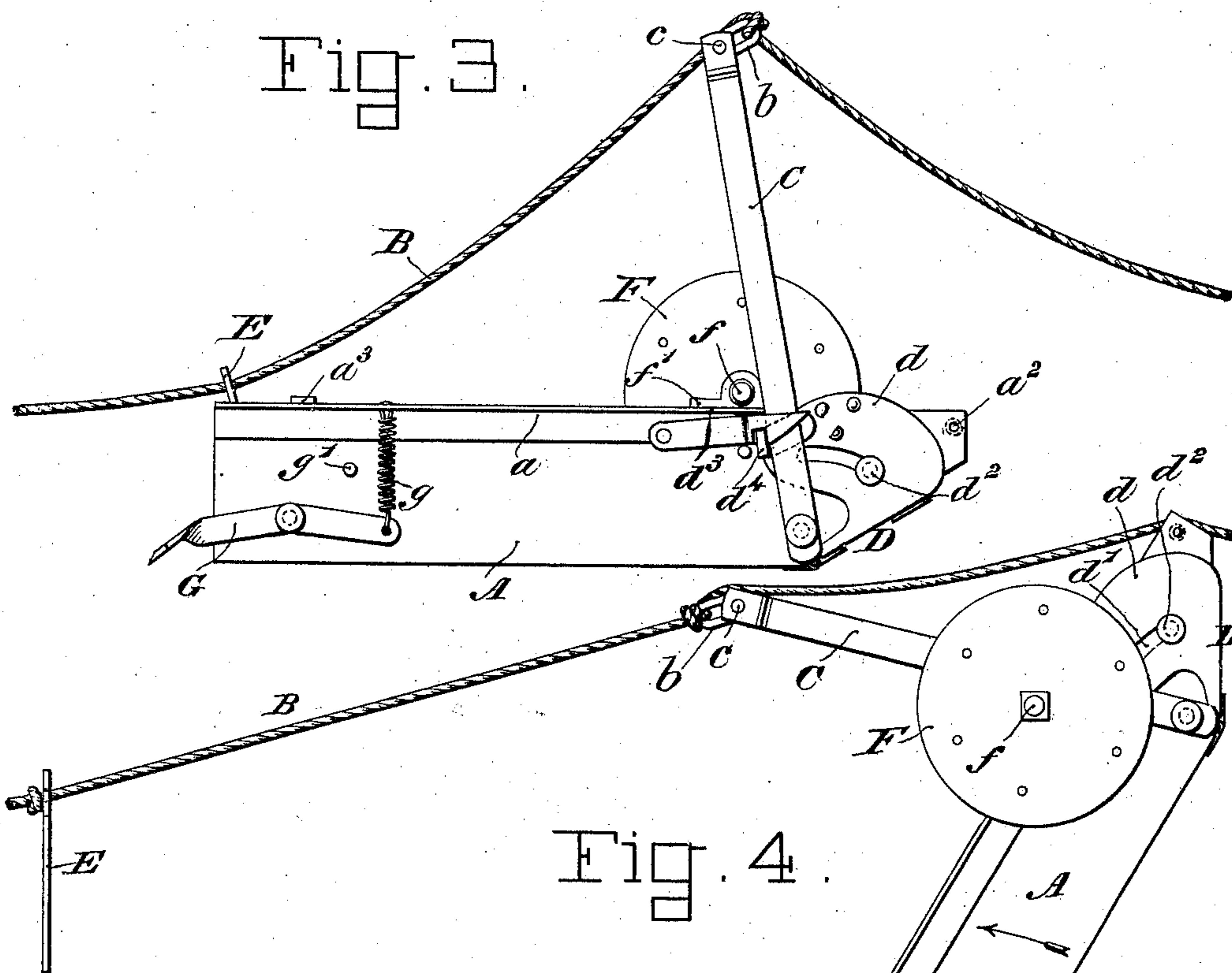
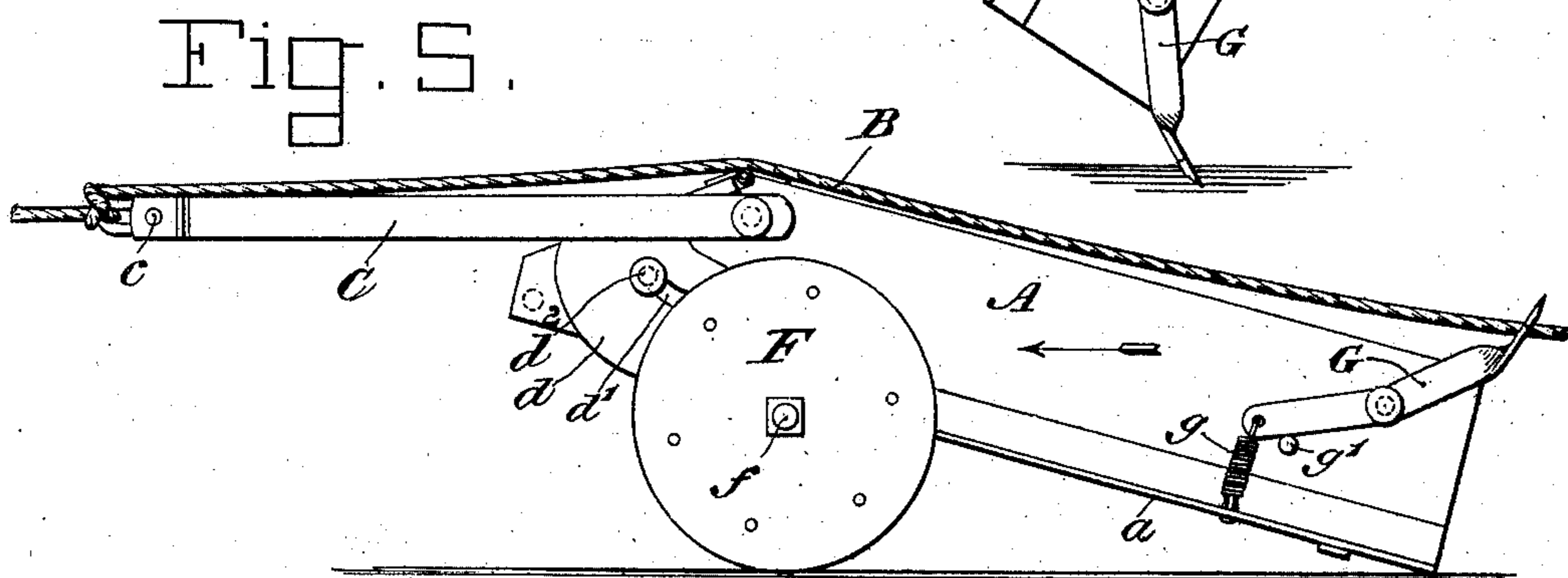


Fig. 4.



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UNITED STATES PATENT OFFICE.

CHARLES L. HOPKINS, OF NEW ORLEANS, LOUISIANA.

EXCAVATING APPARATUS.

963,563.

Specification of Letters Patent.

Patented July 5, 1910.

Application filed April 13, 1909. Serial No. 489,748.

To all whom it may concern:

Be it known that I, CHARLES L. HOPKINS, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Excavating Apparatus; 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.

This invention relates to apparatus for excavating and transporting earth and other materials by a scoop or scraper; and it is of the general character embodied in my application Serial Number 474,534, wherein the scoop or scraper is operated by power through cables.

This invention is particularly adapted for use in the construction of earth embankments such as levees, dikes, dams or similar structures; and it is useful in various other kinds of excavation work.

One object of the invention is to provide an improved system including a scoop or scraper in connection with a cable adapted to be pulled either forward or backward whereby the scraper can be loaded and transported by hauling it by means of the cable in one direction, and unloaded or dumped and returned bottom-upward for another load by pulling the cable in the reverse direction.

Another object is to provide an improved scoop or scraper or what may be termed an excavating and transporting receptacle particularly adapted for carrying out the foregoing object.

Other objects are to provide a scoop of the foregoing character that is operable by and requires but one connection to the cable; to provide improved means for operating the adjustable cutting-end of the scoop; to provide a tail-gate that is removable from the scoop by such cable in the dumping of the scoop; and to provide a rolling support for the scoop during its return to the loading place.

The scoop, which is the subject of this invention and as illustrated in the accompanying drawings, has an adjustable cutting front and a removable tail-gate, and is also equipped with wheels adapted to roll upon the ground when the scoop is inverted. An operating cable is connected to the forward end of the scoop through the medium

of a bail; and said bail has connection also with the removable tail-gate. A forward pull on the cable will cause the apparatus to scoop up the soil and load itself, and, after the scoop is loaded, its cutting-end is raised by forcing the bail upward. A continuation of the forward pull will then transport the scoop to the place of unloading or dumping, and a backward pull on the cable will remove or displace the tail-gate and dump the scoop by overturning it backward, whereupon a continued rearward pull will return the scoop in an inverted or overturned position to the place of unloading. The draft on the cable being again reversed, the forward pull will overturn the scoop forward into its loading and transporting position.

Referring to the drawings: Figure 1 is a plan view of an embodiment of the invention in a scoop and operating cable, a side of the scoop being partly broken away and the cutting-end being shown lowered into position to scoop up soil when the scoop is drawn forward. Fig. 2 is a longitudinal vertical section of Fig. 1. Fig. 3 is a side elevation showing the manner of raising the cutting-end of the scoop, and showing also the means for locking said end in its elevated position; the wheel at the near side of the scoop being omitted. Fig. 4 is a side elevation showing the scoop as being dumped by a rearward pull of the cable, the tail-gate having been withdrawn from the scoop by such rearward pull. Fig. 5 is a side elevation showing the scoop overturned or inverted and being returned in such position to the loading place by a rearward pull on the cable.

A denotes the scoop or scraper which is of the general character shown in my said application, being an open-topped receptacle having a bottom, longitudinal sides, an adjustable cutting-end, and a removable or replaceable tail-gate.

B denotes the cable for hauling and dumping the scoop and for withdrawing the tail-gate. The cable B is connected to the scoop through the medium of a bail C, to which the cable is or may be connected in the manner shown in Fig. 2, wherein the cable is secured to a link *b* which loosely engages a pin *c* secured to the front of the bail C. The rear ends of the bail are pivotally secured to the opposite sides of the scoop near its front, adjacent the cutting-end D,

and preferably near the bottom. This pivotal mounting of the bail enables it to be swung upwardly. If desired, the bail C may be provided with a rod or bar c' extending between and secured to its opposite sides to brace and strengthen the bail. The cable B is also connected to the removable or displaceable tail-gate E. In the illustrated embodiment this connection is accomplished by providing the gate with an aperture e through which the cable is passed, and by means of which the cable may be drawn through said aperture to have a limited transverse movement independent of the tail-gate as hereinafter described. In order that the tail-gate may not slide too far along the cable, the latter may be provided with any suitable stop-means to limit said sliding of the tail-gate as shown in Fig. 4.

The tail-gate E is slidably mounted in the rear of the scoop to make a closure thereof that is displaced or withdrawn by a rearward pull of the cable B. To so mount the tail-gate, lugs e^1 projecting inwardly from both sides of the scoop may form guide-ways for the gate. These lugs are arranged in pairs, two pairs on each side of the scoop, and the lugs comprising a pair being spaced apart to receive between them the tail-gate. The lugs are preferably disposed as shown to incline the tail-gate rearwardly-upward.

The cutting-end D is or may be of the general character shown in my said application, comprising in effect a pivoted extension of the bottom of the scoop, provided preferably with a knife or cutting-edge at its front, and having upright extensions or flanks d which embrace and are adjustably connected to the sides of the scoop. A segmental slot and pin connection is provided between the sides of the scoop and the flanks d , the segmental slots d' being engaged by headed pins d^2 projecting from the sides of the scoop. And the front ends of the sides of the scoop are upwardly inclined to permit the cutting-end to assume its upwardly inclined position and to limit the upward swing of the cutting-end D.

In order that the cutting-end may be held in an elevated position, catches d^3 pivoted to the sides of the scoop are provided to engage, when the cutting-end is raised, studs or lateral projections d^4 carried by the flanks d . These catches are formed preferably to automatically engage the studs d^4 when they are moved thereunder; and to accomplish this the type of catch shown is formed with a beveled outer end, and with a recess beyond such bevel, whereby each stud d^4 , when it strikes the beveled end, raises its catch and passes on until under the recess, whereupon the catch falls latching the stud and retaining the cutting-end elevated. The cutting-end can be raised and the projections d^4

brought into engagement with the catches d^3 by means of the bail C, which as it is lifted upward, strikes the projections d^4 pushing them rearwardly, thus swinging the cutting-end upwardly and forcing the projections d^4 into locking engagement with the catches d^3 , thereby locking the cutting-end in its elevated position.

Preparatory to lowering the cutting-end, the catches d^3 are first unlatched from the studs d^4 . To afford an easy means for lowering the cutting-end, the flanks d are provided with studs e^1 adapted to be detachably engaged by a forked lever H in the manner described in my hereinbefore mentioned application, the lever being shown in dotted lines in Fig. 2.

As previously stated, the scoop is overturned backward to dump, and is rolled back to the loading place bottom upward. To provide such rolling support, wheels F are mounted upon an axle f suitably mounted upon the scoop A, as for example, by means of boxes f' , secured to the sides of the scoop, or to flanges a' which may be provided along a portion of the upper edges of the sides of the scoop.

G indicates claws or teeth pivoted to both sides of the scoop at the rear, and adapted to ride yieldingly over the ground. Springs g , which may be tension spiral springs and which are secured to the scoop and to the front ends of the claws, will insure the claws engaging the ground to provide a fulcrum for the scoop in its backward tilting or dumping movement; and pins g' projecting from the sides of the scoop are provided to form an abutment for the claws during the dumping of the scoop and also for limiting the movement of the claws under the tension of their springs.

The scoop is provided with a roller or bar a^2 at its front end which braces the sides and also forms a support for the cable B which is likewise supported by the shaft f , the cable being thus kept from the bottom of the scoop and out of the way of the cutting-edge as will be seen in Fig. 2. The scoop may be also provided with a bar a^3 at its rear to further brace the sides.

The operation, generally stated, is as follows: Preparatory to a self-loading movement of the scoop, the cutting-end D is lowered as shown in Figs. 1 and 2. This can be done with the forked lever H. The cable B is then given a forward pull, that is a pull that carries the knife-edge of the cutting-end against the ground, whereupon the cutting-end enters the ground loosening the soil and directing it into the scoop which, as will be readily understood, is loaded by a continuation of such forward pull. When the scoop has been sufficiently filled, the cutting-end is raised. This is accomplished by discontinuing the forward pull on the cable

and by swinging the bail C upward. The bail in said swinging movement strikes and moves forward the lugs d^4 carried by the cutting-end thus raising it and carrying the lugs d^4 into locking engagement with the catches d^3 as before explained, and as shown in Fig. 3. The cutting-end is thus held elevated. The forward pull on the cable B is then resumed, the scoop being thereby drawn to the dumping place; and as the cutting-end D is held by the catches at an upward inclination, its cutting-edge is kept out of the ground and the scoop is enabled to mount upon and ride over ordinary obstructions as well as over mud and soft ground. When the dumping place is reached, the forward pull on the cable is discontinued, and it is hauled in a reverse or rearward direction. This backward pull first draws the cable through the opening e of the tail-gate thus saving the latter from lateral stress that would tend to bind it in the guide-ways; and such pull also swings the bail C upward, and, as the cable becomes taut, it lifts the tail-gate out of the scoop. The rearward pull of the cable swings the bail upward until the latter is arrested against further movement, whereupon the scoop tilts backward, as shown in Fig. 4, dumping its load and turning over until it is bottom-side up with the wheels F upon the ground, as shown in Fig. 5; then a continuation of the rearward pull on the cable rolls the scoop thus inverted back to the loading place; whereupon, the draft on the cable being again reversed, the scoop is overturned forward into its upright or loading position ready for the transportation of another load.

The cable B may be driven by a drum or drums in the usual and well known manner.

I am aware that modifications in some of its details may be made without departing from the spirit and scope of my invention, and I therefore reserve the right to such modifications.

Having described my invention, what I claim is:

1. The combination with a receptacle adapted to dump by tilting, of a cable connected to the receptacle to draw it forward and to dump it and draw it backward, and a tail-gate movably mounted in the receptacle and connected to the cable to be removed by the latter out of the path of the discharging load when the cable is dumping the receptacle.

2. The combination with a scoop, of a cable for hauling it forward and backward, a tail-gate mounted in the scoop to be removable therefrom and connected to the cable, the latter being adapted to dump the scoop and remove the tail-gate therefrom and return the scoop to its starting place.

3. The combination with a tilting-dump receptacle, of a bail pivotally connected to

the scoop, means fixed to the scoop to provide stops to limit the upward swing of the bail, and a cable connected to the bail, a forward pull of the cable transporting the scoop in an upright position and a reverse pull of the cable swinging the bail against said stops and a continuation of said pull then tilting the scoop to dump it.

4. The combination with a tilting-dump receptacle, of projections carried by the receptacle, a bail connected to the scoop to have a pivotal movement that is limited in an upward direction by said projections, and a cable connected to the bail, a forward pull of the cable transporting the scoop in a load-carrying position and a reverse pull of the cable swinging the bail to the limit of its pivotal movement and thereafter tilting the scoop.

5. The combination with a scoop, of a tail-gate mounted therein to slide upwardly out of the scoop, and a cable connected to the scoop to move and to dump it, said cable being connected to the tail-gate to lift it out of the scoop when the latter is dumping, said cable having a limited movement transverse of the tail-gate that does not affect it.

6. The combination with a scoop, of a tail-gate mounted therein to slide upwardly out of the scoop, and a cable connected to the scoop to transport it to and fro and to dump it, said cable passing loosely through an aperture of the tail-gate and being adapted to lift the tail-gate out in dumping the scoop.

7. The combination with a scoop or scraper adapted to dump by tilting backward, of a bail pivoted to the sides of the scoop near its front lower end and having a limited pivotal movement on the scoop, means fixed to the scoop for limiting or stopping the pivotal movement of the bail, and a cable connected to the scoop and adapted to swing said bail until arrested by said stopping means, a continued pull thereafter on the cable tilting the scoop over backward into an inverted position, a reverse pull on said cable overturning the scoop to its normal position.

8. The combination with a scoop, of a cutting-end connected thereto to have a limited pivotal movement, a bail pivoted to the scoop near its lower front edge, and a cable connected to the bail and adapted to swing it backward, the cutting-end having means with which the bail engages in its backward movement, whereby when said cutting-end reaches the end of its pivotal movement further pull upon the cable dumps the scoop over backward.

9. The combination with a scoop, of a cutting-end pivoted thereto and having flanks extending upwardly along the sides of the scoop, said flanks having projecting studs, a bail pivoted to the scoop and adapted to

be swung into engagement with said studs and to thereby move the cutting-end pivotally.

10. The combination with a scoop, of a cutting-end pivoted thereto and having flanks extending upwardly along the sides of the scoop, said flanks having projecting studs, a bail pivoted to the scoop and adapted to be swung into engagement with said studs and to thereby move the cutting-end pivotally, and catch-means adapted to latch the cutting-end when it reaches its uppermost position.

11. The combination with a scoop having its bottom flat upon the ground in its loading and load-carrying positions and adapted to dump by being overturned, of wheels mounted on the scoop and adapted to roll on the ground when the scoop is overturned.

12. The combination with a scoop having

its bottom flat upon the ground in its loading and load-carrying positions and adapted to dump by being overturned, of an axle mounted on the scoop, and wheels mounted on the scoop to roll upon the ground when the scoop is overturned.

13. In a tilting-dump receptacle, claws pivoted to the sides of the receptacle, the pivot of a claw being intermediate its ends, a spring for each claw engaging one end of it adapting the claw to ride yieldingly over the ground, and stops carried by the sides of the scoop and adapted to form abutments for the claws.

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

CHARLES L. HOPKINS.

Witnesses:

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