

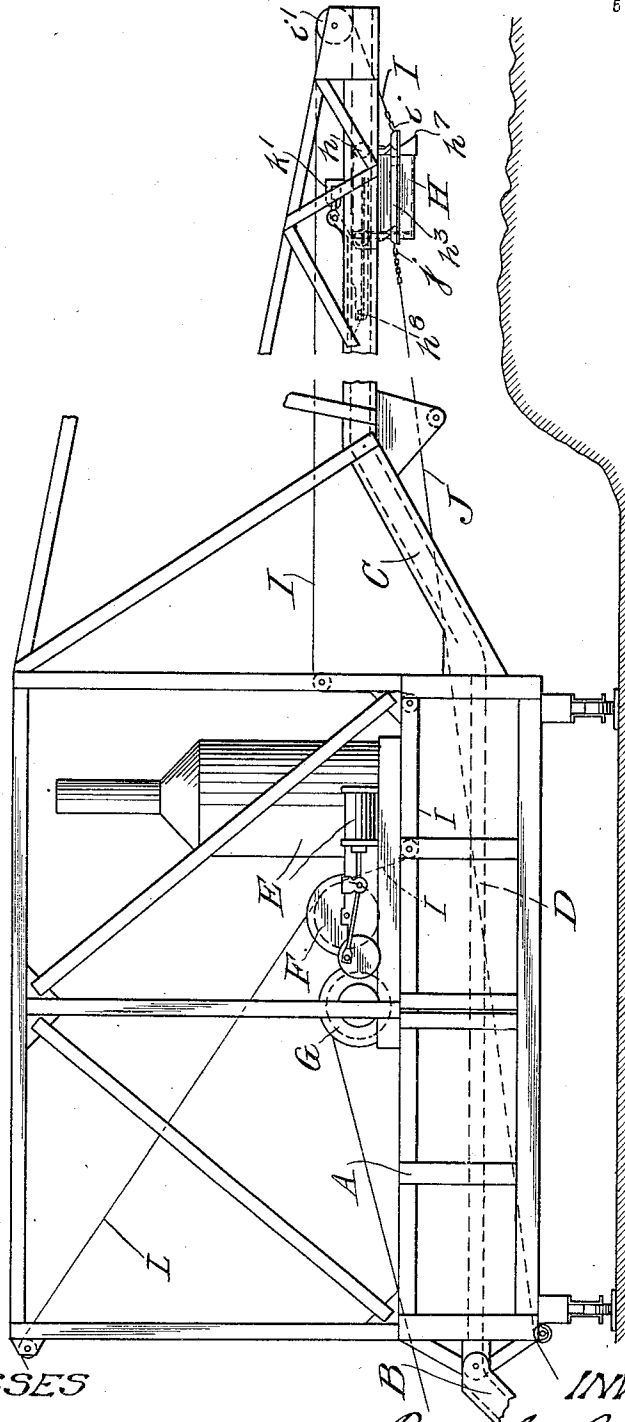
M. G. BUNNELL.
EXCAVATOR AND LEVEE BUILDER.
APPLICATION FILED MAR. 22, 1909.

1,064,285.

Patented June 10, 1913.

5 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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C. E. Taylor.

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M. G. Bunnell

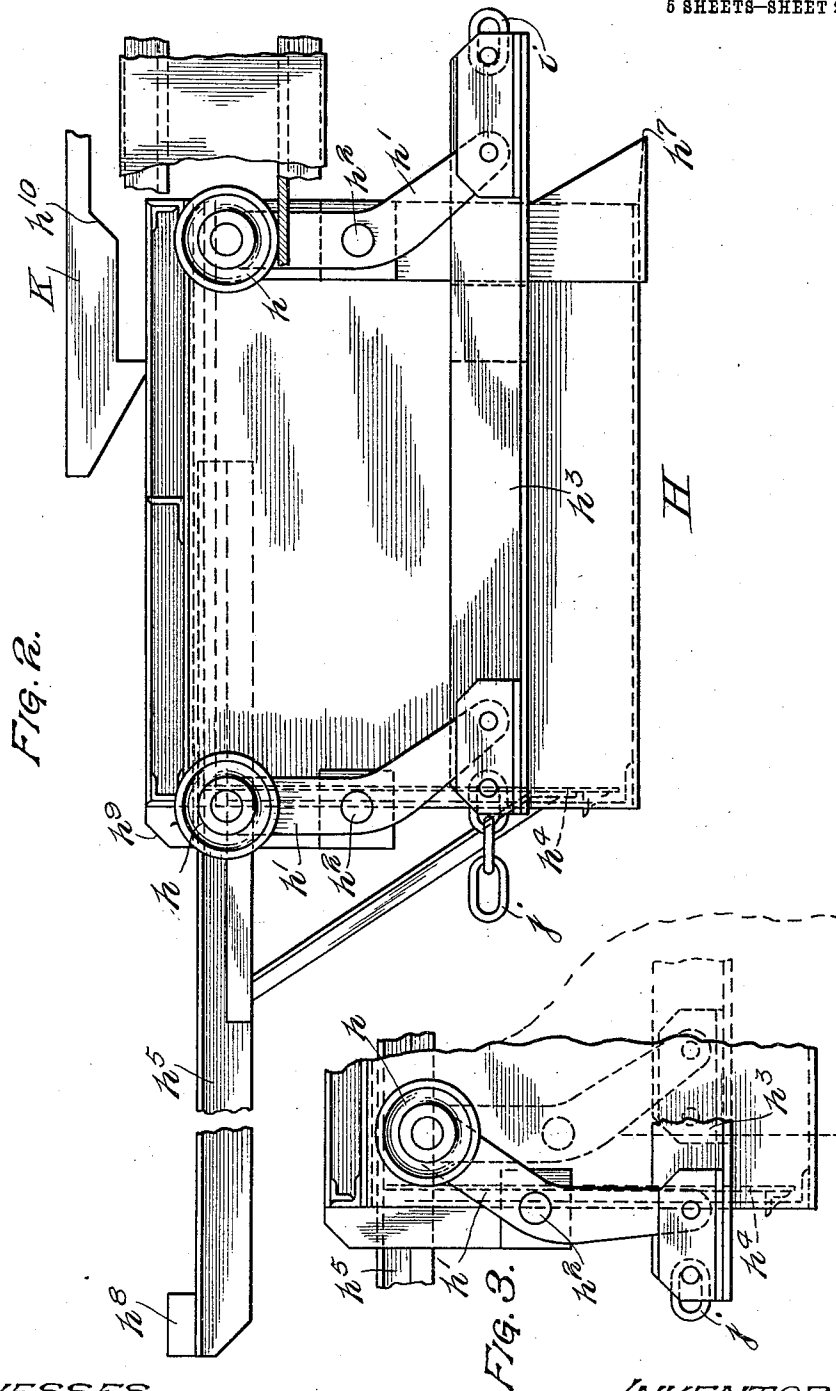
By Bulkley, Ward & Dwyer
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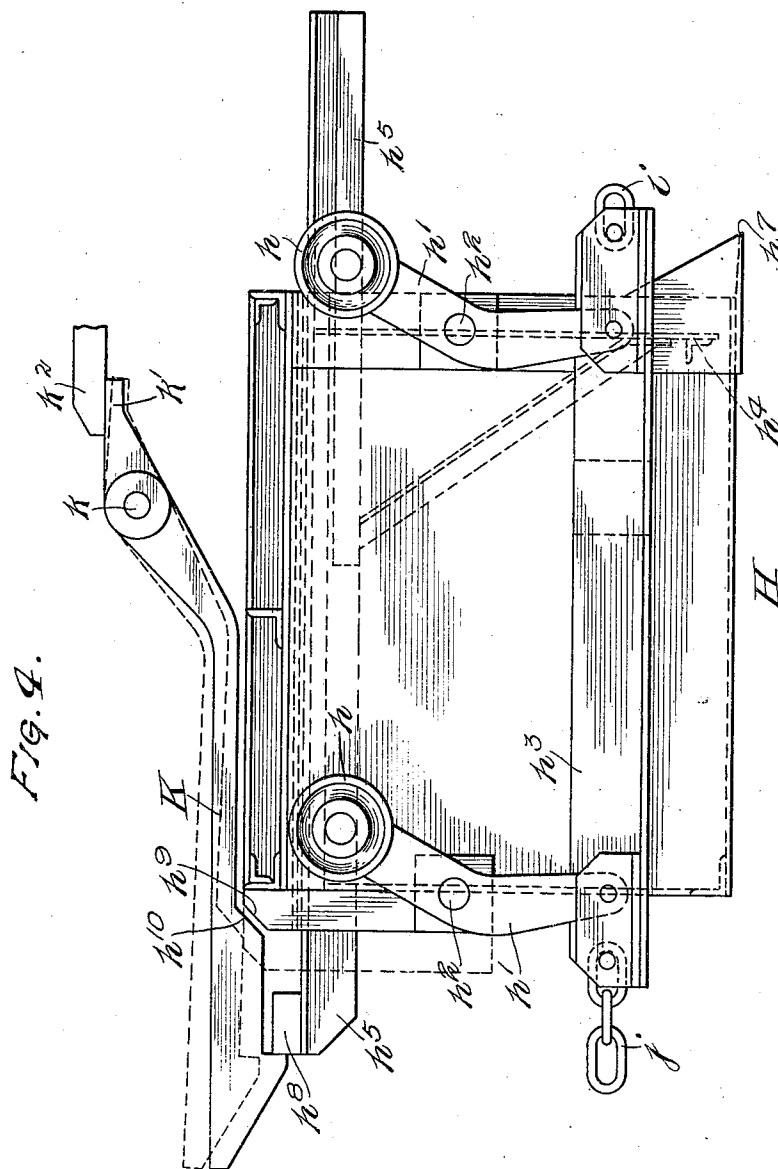
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5 SHEETS—SHEET 3.



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5 SHEETS—SHEET 4.

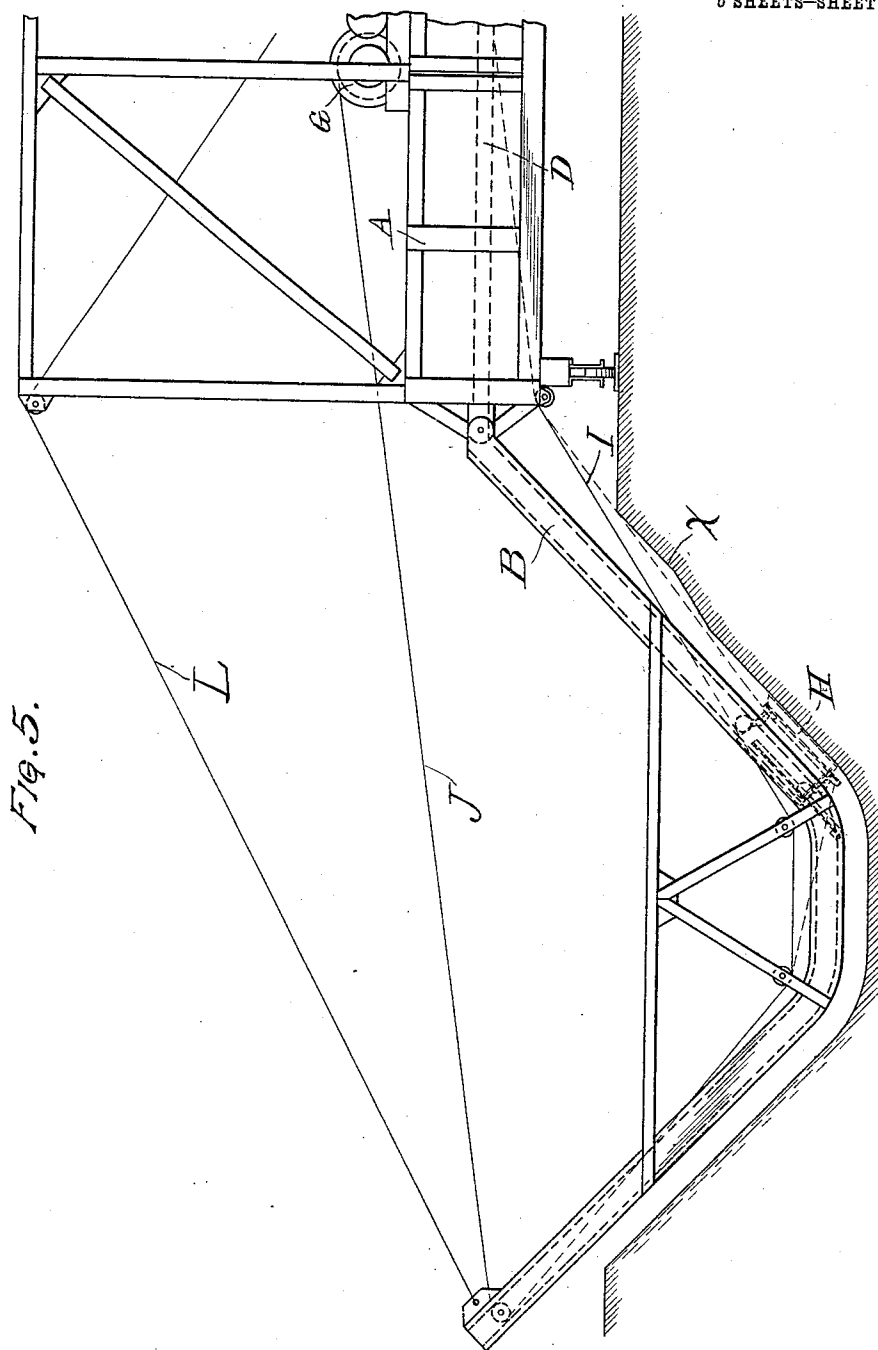


Fig. 5.

WITNESSES

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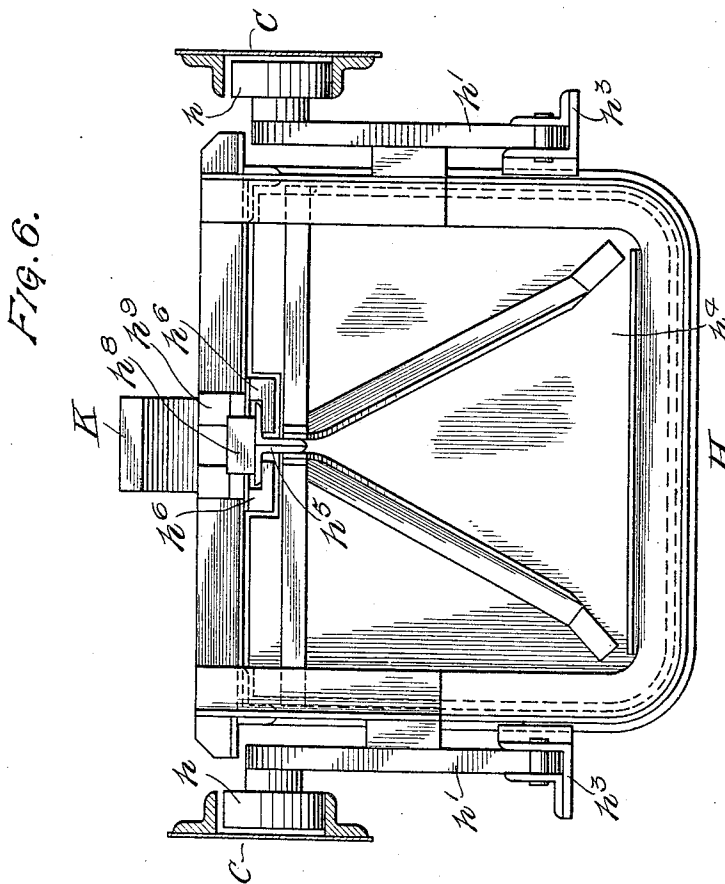
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5 SHEETS—SHEET 5.



WITNESSES

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EXCAVATOR AND LEVEE-BUILDER.

1,064,285.

Specification of Letters Patent.

Patented June 10, 1913.

Application filed March 22, 1909. Serial No. 485,066.

To all whom it may concern:

Be it known that I, MORTON G. BUNNELL, a citizen of the United States of America, and resident of Chicago, Cook county, Illinois, have invented a certain new and useful Improvement in Excavators and Levee-Builders, of which the following is a specification.

My invention relates to that type of excavators in which a bucket is arranged to travel back and forth on a runway. Excavators of this character are employed for building levees, and for making ditches for drainage or other purposes. Ordinarily, the bucket travels back and forth across the ditch, loading in one direction, and returning in the opposite direction for a fresh start. It is common for the bucket to discharge its load at the end of either direction of movement. As shown, however, the bucket loads by movement in one direction, and then travels back across the machine to discharge its load at the other side thereof.

The object of my invention is to provide an excavator of this character in which the reverse movement of the bucket, after it reaches the dumping position, serves to forcibly discharge the load therefrom. The advantages of my invention will, however, hereinafter more fully appear.

In the accompanying drawings—Figure 1 is a side elevation of an excavator embodying the principles of my invention. Fig. 2 is an enlarged side elevation of my improved bucket, showing the same in carrying position. Fig. 3 is a fragmentary view of a portion of the bucket, illustrating the manner in which the same is lifted slightly when it returns to the ditch or excavation—that is to say, when it travels back from the place where it discharged its load. Fig. 4 is a view similar to Fig. 2, but showing the back of the bucket moved forward to discharge the load therefrom, which operates across as soon as the motion of the bucket is reversed after it reaches the position for dumping. Fig. 5 is a side elevation of the runway that hangs in the ditch or excavation, and the adjacent portion of the body of the machine, illustrating the

mode of operation of the bucket. Fig. 6 is an end view of the bucket, on a larger scale, showing the runway in cross section.

As thus illustrated, the excavator comprises a body A adapted to travel at one side of the ditch or excavation. A runway B is pivoted at the side of the body and adapted to hang in the ditch or excavation. For convenience of illustration, the said runway is shown broken away in Fig. 1, but its form and mode of operation will be readily understood from Fig. 5. The runway C is arranged at the other side of the machine, and is connected with the runway B by means of a track D on the body. An engine and boiler E, for operating the drums F and G, are mounted on the body.

The bucket or scoop H is rectangular in form, and has rolls or wheels h adapted to travel in the channels of the runways, and in the track D, during the operation of excavating. This bucket or scoop is provided with four levers or arms h' , which are pivoted at h^2 , and which carry the said rolls or wheels h at their upper ends. At their lower ends these levers or arms are connected by the bars h^3 , one at each side of the bucket. The connection between the said levers h' and the bars h^3 is of a pivoted nature, each lever being pivoted at its lower end to one of the said bars. The cable or chain I is secured by the links i to the front end of the bars h^3 , and is arranged to travel over the sheave i' on the runway C, and is operated by the drum F on the body of the excavator. Another cable or chain J is secured by the links j to the rear end of the bars h^3 , and is operated by another drum G on the body. It will be understood that this cable or chain J is arranged to travel around a sheave at the end of the runway B, and that this is the cable or chain by which the bucket is returned to the ditch after the load is dumped at the outer end of the runway C. The cable or chain I is the one by which the bucket is pulled forward across the ditch causing it to load, and then across the machine and to the outer end of the runway C where the load is dumped.

The dumping is accomplished automati-

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cally, in the following manner: The runway C is provided with a hook K pivoted thereto at h and held normally in position by engagement of its shorter end h' with the stop h^2 on the runway, (see Fig. 4). In Fig. 2 the bucket is shown in carrying position, and is approaching the said hook. The back h^4 of the bucket or scoop H is movable relative thereto. Said back is rigid with the two angle irons h^5 which slide in guides h^6 carried by the bucket. When the pull is on the cable or chain I, the back h^4 is at the rear end of the bucket, and the latter fills or loads with the soil in ditch. For this purpose the bucket is provided with a lip or cutting edge h^7 at the forward lower edge thereof. At its rear end, the bar formed by the angle irons h^5 is provided with a block h^8 adapted to engage the hook K, as shown in Fig. 4. This happens when the bucket travels to the outer end of the runway C and passes the said hook, as shown in Fig. 1. Then the motion of the bucket is reversed and the block strikes the hook, as shown in Fig. 4, and a continued pull on the cable or chain J causes the bucket to move backward while its back h^4 stands still. This, of course, expels the load, and causes the bucket to discharge its contents. In order that the bucket may pass the hook and return to the ditch, it is provided with a cam h^9 adapted to engage a cam or bevel h^{10} on the under side of the hook, as shown in Fig. 4. Thus when the load is entirely expelled from the bucket the block h^8 is disengaged from the hook, and the bucket returns to the ditch. Then when the pull is resumed on the cable or chain I the bucket moves forward and the back h^4 stands still until it returns to the rear end of the bucket. The operation of filling the bucket then proceeds as before, and the operation of dumping, first described, is repeated when the bucket reaches the runway C and starts back to the ditch. It will be seen, therefore, that it is the initial return motion of the bucket to the ditch or excavation that effects the automatic dumping of the load. The load is forcibly ejected from the bucket or scoop, by the said return motion. The bucket is in reality pulled off from the load. In this way the load is effectively dumped, regardless of the character of soil in which the excavation is being carried on. It will be seen that when the pull is on the cable or chain J the leverage exerted by the levers h' tends to lift the bucket or scoop, as shown in Fig. 3. Thus the bucket or scoop is held clear of the ground when it returns to the ditch. When the pull is reversed on the cable or chain I, then the bucket or scoop settles down into position to receive a load, as shown in Figs. 2 and 4. In this way it

has a slight or sufficient rise and fall, traveling one way on the ground, and traveling the other way clear of the ground.

By referring to Fig. 5, it will be seen that the runway B hangs in the ditch or excavation, and is preferably the same in form or shape as the cross sectional contour of the ditch when completed. When the bucket travels backward on the runway—that is, toward the outer end of the latter—it does so in a slightly elevated position, as previously explained, and then moves downward slightly as soon as it starts to move forward to gather a load. For this reason it can be moved a short distance into the cut or excavation, and its motion can then be reversed, thus gathering up a load without traversing more than a small portion of the bottom or side of the ditch. This is indicated in Fig. 5, wherein it will be seen that the previous operation of the bucket made the depression X in the side of the ditch. The next time the bucket will be moved a little farther along, so as to keep the position shown in dotted lines in Fig. 5, and then when its motion is reversed, it will dig into the ground and gather up a load, in a manner to extend the depression X farther down the slope of the ditch. This operation can be repeated until the bucket has worked entirely across the ditch until it has taken the last load from the opposite side thereof. Then the runway can be lowered slightly, and the operation repeated until another lift or layer of dirt has been taken off entirely across the ditch. In this way it is unnecessary for the bucket to travel backward entirely across the ditch, and to then travel forward across the same, scraping over the entire interior surface of the ditch while gathering up its load. As explained, the first load, after the runway has been properly set or adjusted, can be taken from the near side of the ditch, the next load can be taken from a little farther on, and so on until by a series of scooping operations the dirt has been taken off clear across the ditch. I find that by this method the operation of excavating by means of a machine of this character is facilitated and rendered more satisfactory. The runway B is raised and lowered by a cable L operated by a drum on the body of the excavator.

What I claim as my invention is:

1. In an excavator, a bucket or scoop, a runway therefor, means including clutch mechanism on the runway for expelling the load from the bucket by the backward motion thereof, and means on the bucket for releasing said mechanism.

2. In an excavator, a bucket or scoop, a runway therefor, a movable back therefor, means including clutch mechanism on the runway for operating said back to expel

the load from the bucket by the backward motion thereof, and means on the bucket for releasing said mechanism.

3. In an excavator, a bucket or scoop, a runway therefor, an ejector therefor, means including clutch mechanism on the runway for operating said ejector by the backward motion of the bucket, and means on the bucket for releasing said mechanism.

4. In an excavator, a bucket or scoop, a movable back therefor, a stationary hook for causing the back to stand still while the bucket moves backward, and means on the bucket for automatically releasing the said hook when the load is entirely discharged.

5. In an excavator, a runway provided with a hook, a bucket or scoop adapted to travel on said runway, a movable back for said bucket or scoop, means on the back adapted to be caught and held by the said hook, and means on the bucket for engaging said hook to release the same from the back.

6. In an excavator, a bucket or scoop, levers or arms pivoted on the sides thereof, wheels on the upper ends of said levers, means for connecting together the lower ends of said levers, a runway for said wheels, and devices for pulling in opposite directions on the lower ends of said levers, whereby the bucket is lifted clear of the ground when it travels backward.

7. The combination, in an excavator of the character disclosed, of a bucket or scoop, a movable back therefor, means including clutch mechanism on the runway for operating said back to expel the load from the bucket by the backward motion thereof, means for moving the runway for holding the said bucket or scoop down in the ditch or excavation, and means on the bucket for automatically releasing said mechanism.

8. The combination, in an excavator of the character disclosed, of a bucket or scoop, a runway therefor, an ejector therefor, means including clutch mechanism on the runway for operating said ejector by the backward motion of the bucket, means for moving the runway for holding the said bucket or scoop down in the ditch or excavation, and means on the bucket for automatically releasing said mechanism.

9. The combination, in an excavator of the character disclosed, of a bucket or scoop, a movable back therefor, a stationary hook for causing the back to stand still while the bucket moves backward, means for automatically releasing the said hook when the load is entirely discharged, and a runway for holding the said bucket or scoop down in the ditch or excavation.

10. The combination, in an excavator of the character disclosed, of a bucket or scoop, means serving automatically to forcibly lift the same bodily when it travels

backward, a runway for holding the said bucket or scoop down in the ditch or excavation, and a draft connection for operating said means and drawing the bucket backward, said means comprising wheels that travel back and forth on said runway.

11. The combination, in an excavator of the character disclosed, of a traveling bucket or scoop, levers and rolls thereon serving automatically to lift the bucket clear of the ground when it travels backward, and a runway for holding the said bucket or scoop down in the ditch or excavation, when it travels forward.

12. The improved excavator, comprising a runway and bucket thereon, an end wall for the bucket, a hook pivoted on the runway for holding the said wall stationary, to dump the load, and means on the bucket for releasing said hook, substantially as shown and described.

13. An excavating machine comprising a runway, a bucket, wheels that support the bucket, and travel on the runway, a pivoted lever for each wheel, a connection between said levers, and means attached to said connection to operate the bucket back and forth on said runway.

14. An excavating machine comprising a runway, a bucket, wheels that support the bucket and travel on the runway, a pivoted lever for each wheel, a connection between said levers, and means attached to said connection to operate the bucket back and forth on said runway, said levers being pivoted on the sides of the said bucket, and said connection embracing the bucket.

15. An excavator comprising a runway, a bucket mounted to travel back and forth on said runway, said bucket having a movable wall for expelling the load, a catch on the runway for holding said wall stationary while the bucket moves a distance in the reverse direction, after reaching dumping position, means on the bucket for automatically disengaging said catch from said wall, and means for operating said bucket, said catch comprising a pivoted hook and a cam on said hook adapted to engage said means on the bucket.

16. An excavator comprising a runway, a bucket mounted to travel back and forth on said runway, said bucket having a movable wall for expelling the load, a catch on the runway for holding said wall stationary while the bucket moves a distance in the reverse direction, after reaching dumping position, means on the bucket for automatically disengaging said catch from said wall, means for operating said bucket, said catch comprising a hook pivoted on the runway, and means for limiting the downward movement of said hook.

17. An excavator comprising a runway, a

bucket mounted to travel back and forth on
said runway, said bucket having a movable
wall for expelling the load, a catch on the
runway for holding said wall stationary
5 while the bucket moves a distance in the re-
verse direction, after reaching dumping po-
sition, means on the bucket for automati-
cally disengaging said catch from said wall,

and means for operating said bucket, the
said bucket having tracks for said wall. 10

Signed by me at Chicago, Illinois, this
12th day of March, 1909.

MORTON G. BUNNELL.

Witnesses:

CLARENCE E. TAYLOR,
J. NORBY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
