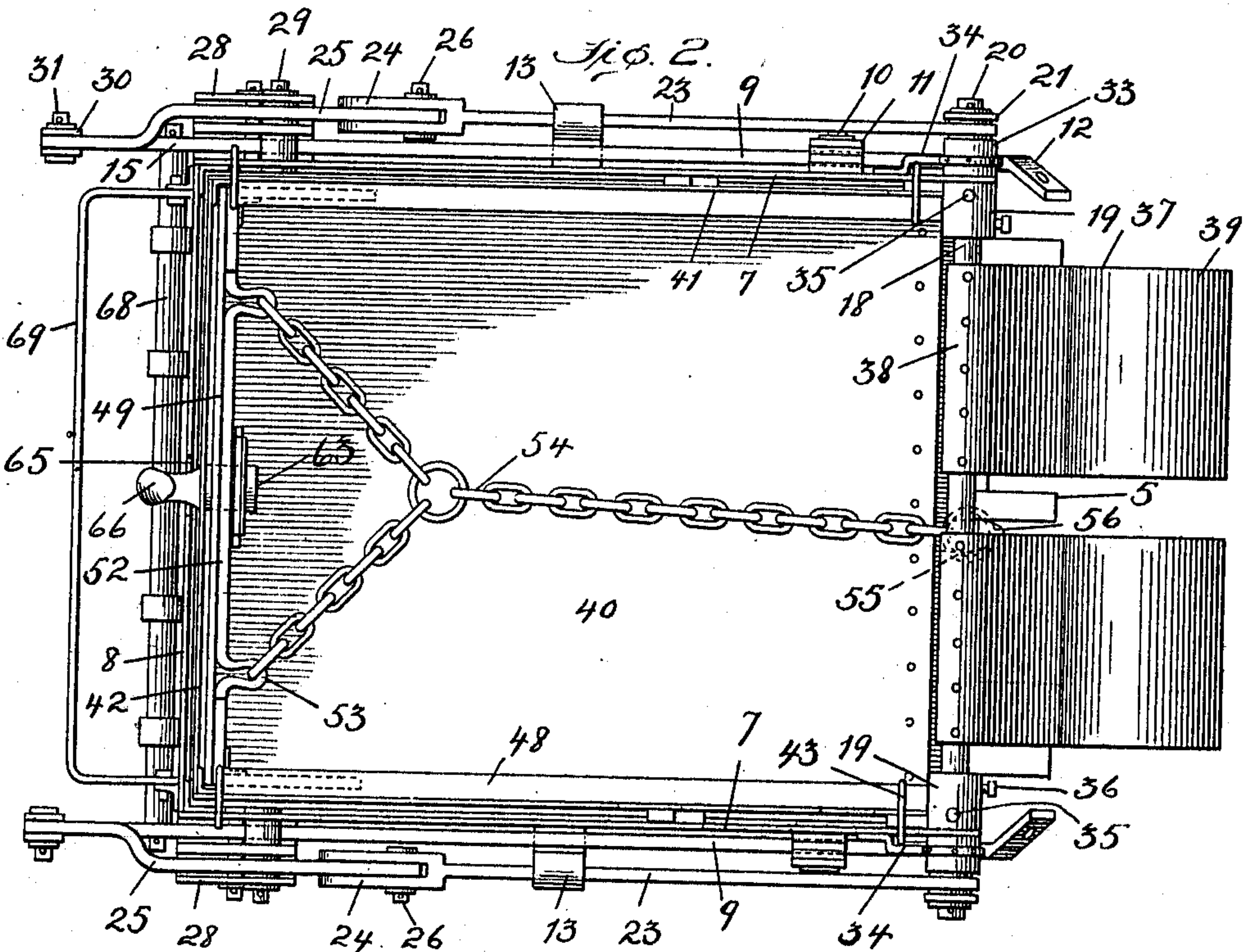
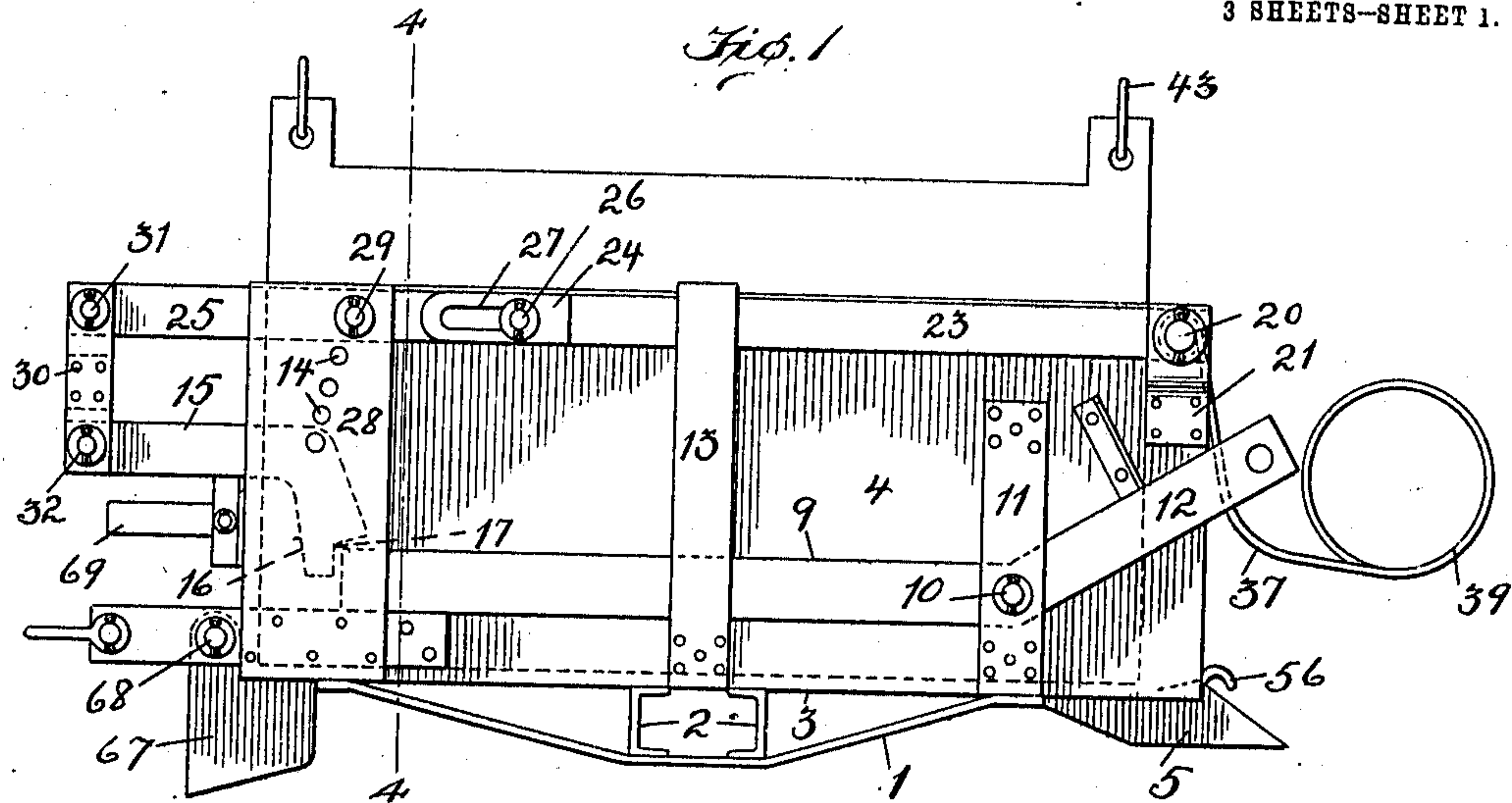


R. P. McCORMICK.  
EXCAVATOR.  
APPLICATION FILED AUG. 15, 1910.

993,785.

Patented May 30, 1911.

3 SHEETS—SHEET 1.



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Fig. 3.

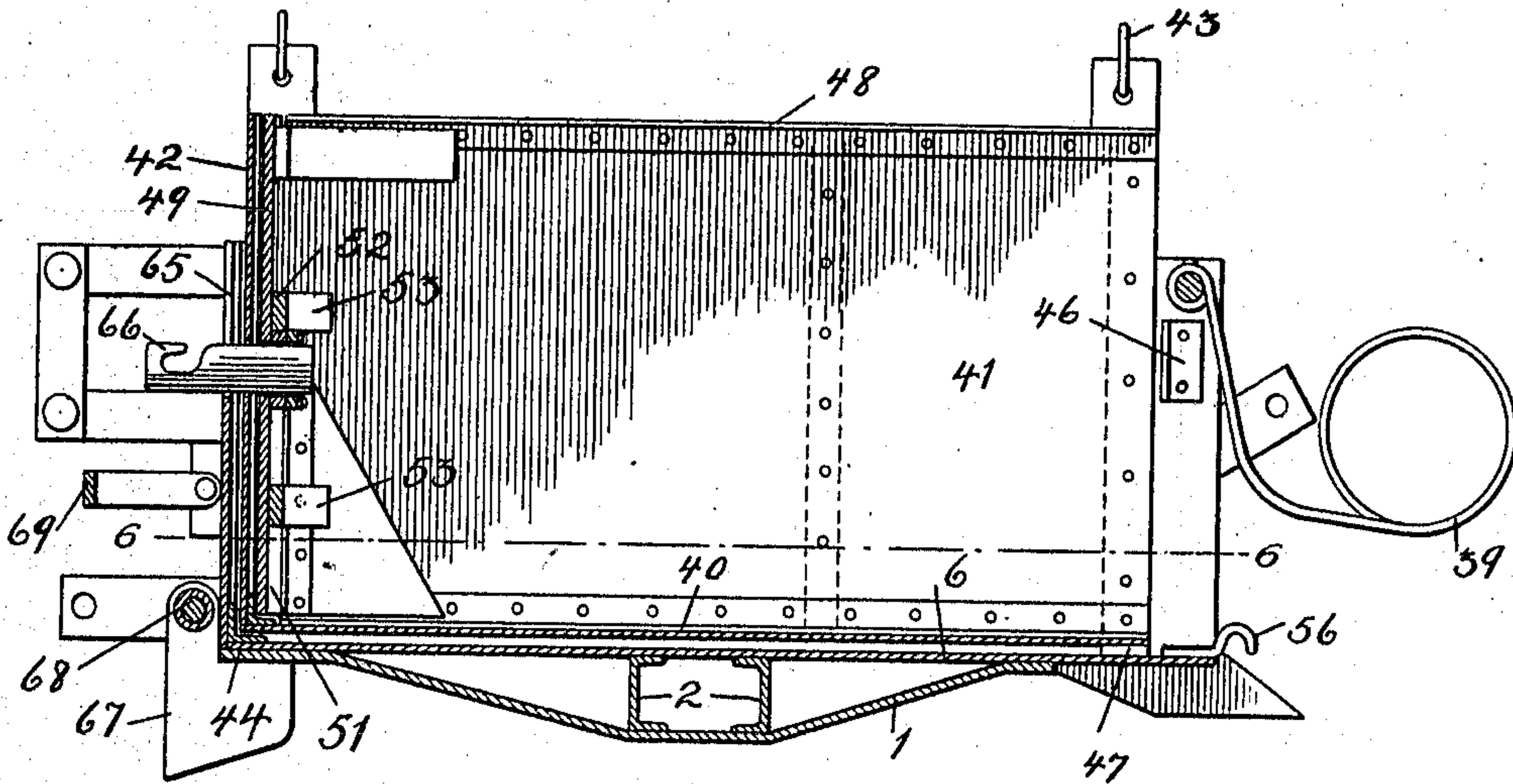
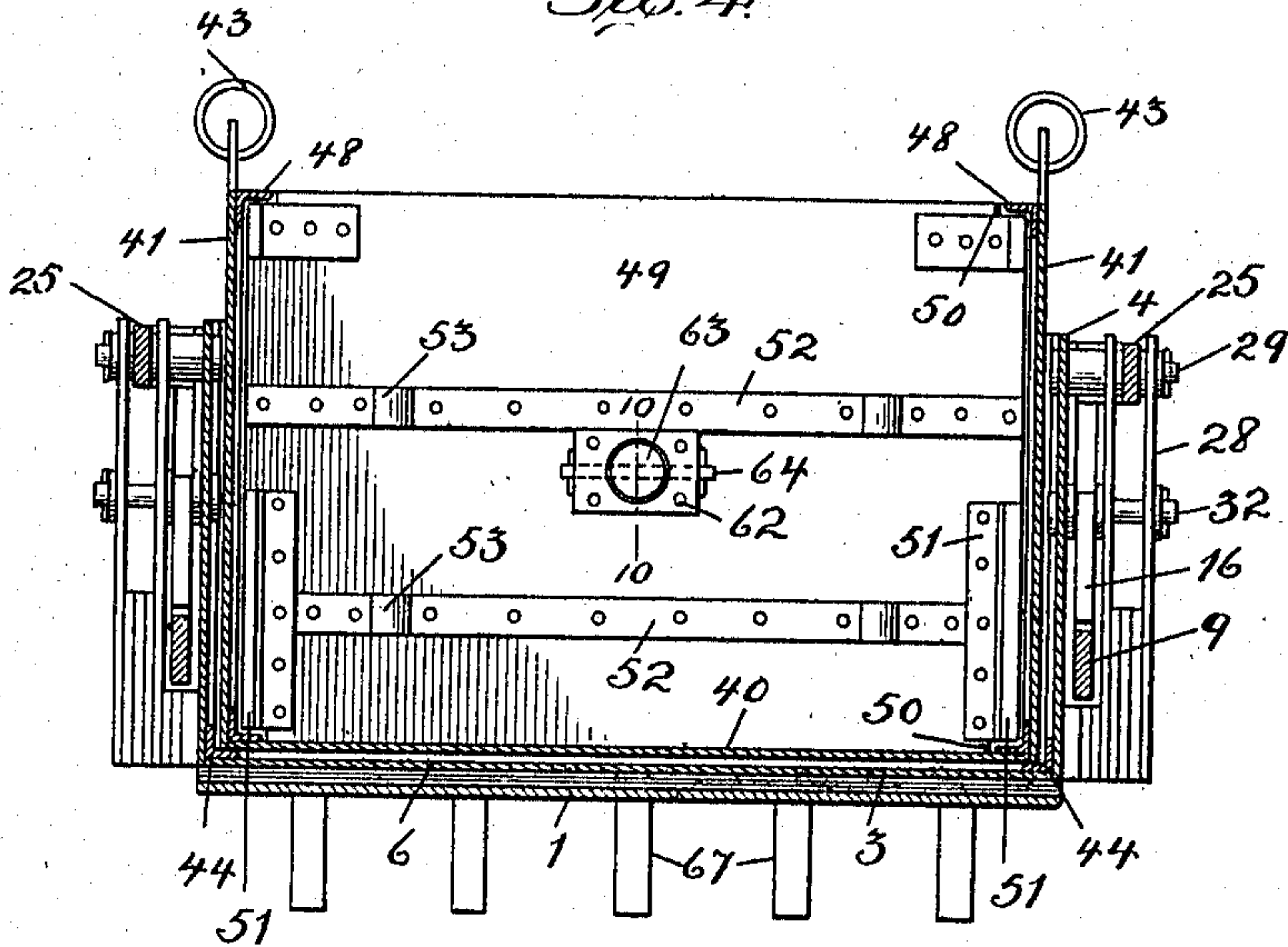


Fig. 4.



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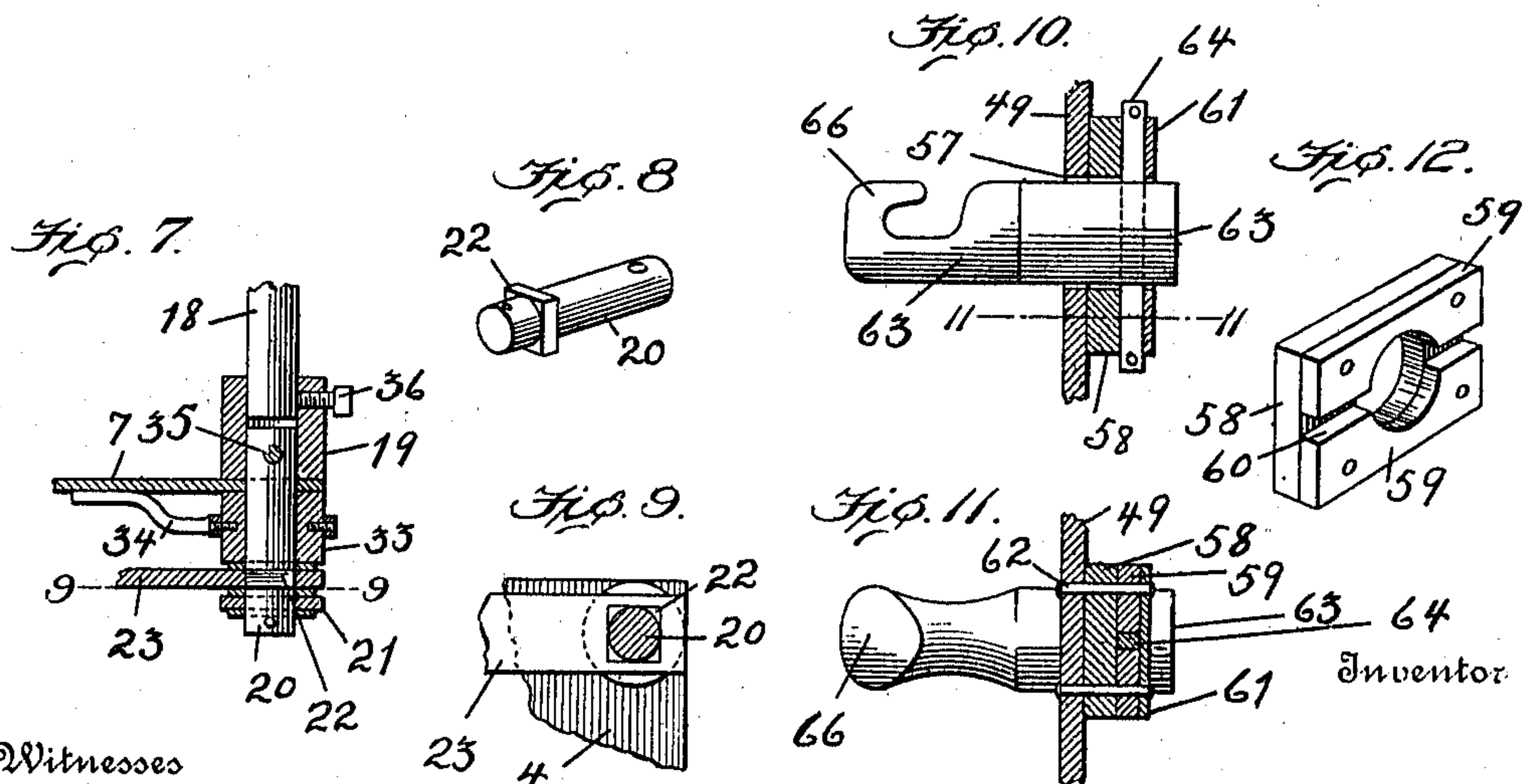
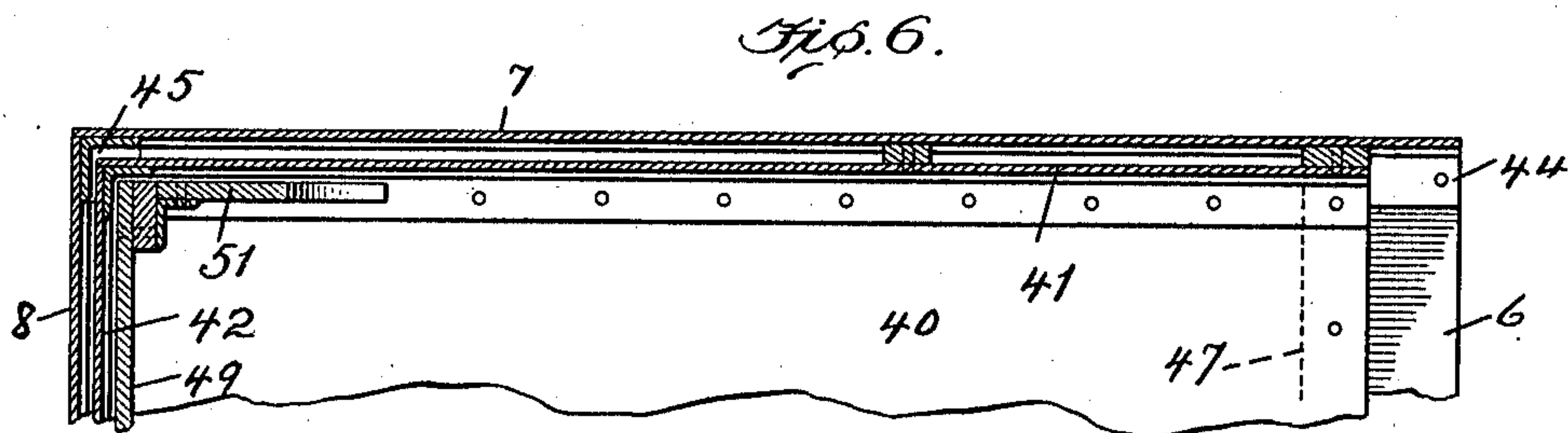
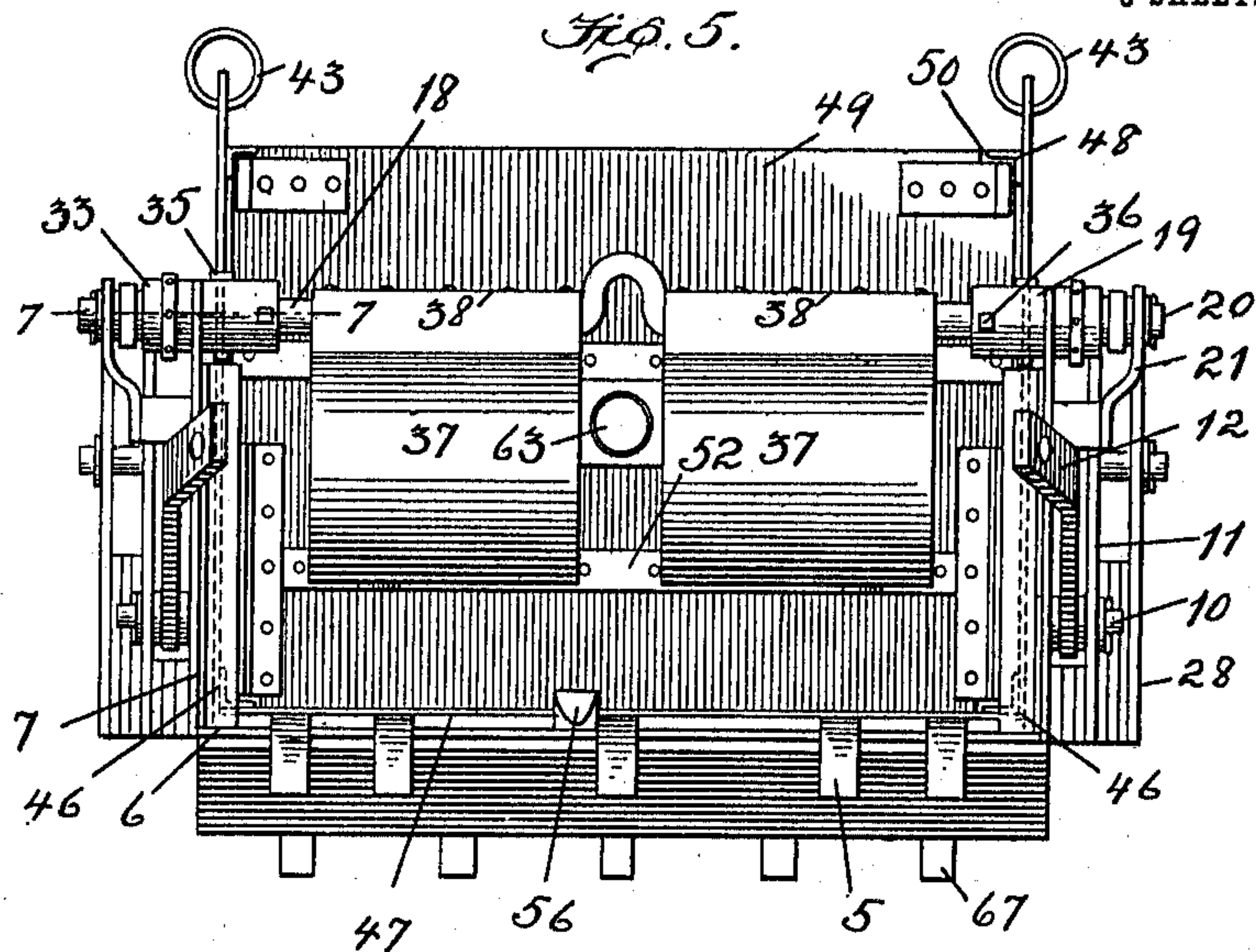


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# UNITED STATES PATENT OFFICE.

RICHARD P. McCORMICK, OF GRANITE, MARYLAND.

## EXCAVATOR.

993,785.

Specification of Letters Patent.

Patented May 30, 1911.

Application filed August 15, 1910. Serial No. 577,151.

*To all whom it may concern:*

Be it known that I, RICHARD P. McCORMICK, a citizen of the United States, residing at Granite, in the county of Baltimore and State of Maryland, have invented certain new and useful Improvements in Excavators, of which the following is a specification.

This invention relates to improvements in excavators and has particular reference to a traveling excavator that will plow, cut-up and excavate earth, loose rock, hard-pan and similar materials preparatory to the building of railroads, county roads, municipal works, sewers, tunnels and other engineering projects.

One object of the invention is to provide an improved construction of excavator that will materially cheapen the cost of excavations, reduce the labor cost and which may be readily shifted from one position to another as the work progresses.

A further object of the invention is to provide an improved construction of excavator by means of which the materials dug up and deposited therein may readily be discharged.

Another object is to provide an improved excavator having means for regulating the depth of the cut whereby the excavator may be drawn down into the soil to a predetermined depth and then automatically elevated and drawn upwardly.

A still further object is to generally improve the construction of excavators whereby to make them more efficient and durable.

With these, and other objects in view and seeking all the advantages growing out of the invention the latter is illustrated in the accompanying drawings wherein,

Figure 1, is a side elevation of an excavator embodying features of the invention. Fig. 2, is a top plan view of the same. Fig. 3, is a central vertical section through the same. Fig. 4, a vertical cross-section of the same,—the section being taken on the line 4—4 of Fig. 1. Fig. 5, is a front elevation of the excavator. Fig. 6, is an enlarged sectional plan view of one side and a portion of the end wall of the outer and inner shells of the excavator. Fig. 7, is a horizontal sectional detail through the brackets and bearings at the front of the excavator which carry the shaft that controls the movement of the excavator either downward or upward,—the section being taken on the line

7—7 of Fig. 5. Fig. 8, is a perspective detail of the short shaft that is carried in said brackets and bearings. Fig. 9, is an enlarged vertical section through short shaft that actuates the trip levers,—this section being taken on the line 9—9 of Fig. 7, and Figs. 10, 11 and 12 are details of the hook device at rear of the false back, by which said false back is drawn back from front end of scraper after plowing load out.

Referring to the drawings by numerals, 1, designates the rocker bottom of the excavator shell which inclines downwardly from its front and rear ends toward the center where it is lowest and horizontal beams or channel bars, 2, extend crosswise of the rocker bottom at said central or lowest point and are interposed between said rocker bottom and the under side, 3, of outer shell, 4, of the excavator. At the forward end the outer shell, 4, is provided with a plurality of spaced-apart plow-teeth, 5, which may be secured thereto in any suitable manner and whose downwardly-inclined and forwardly-projecting ends are slightly in advance of the outer shell. The outer shell of the excavator in the present instance is in fact a scraper or scoop in that as it is drawn forward by means of cables operated by an engine or motor it digs down into the soil and scoops up the earth which passes into the inner shell which will presently be described.

The outer shell or scraper is provided with a bottom, 6; side walls, 7, and a vertical rear end wall, 8, which connects the side walls but the shell is entirely open at the forward end. The side-walls each carry a draft bar or lever, 9, which is pivoted, at 10, in a suitable bracket, 11, and the forward end, 12, of each bar or lever is turned to extend at an angle with respect to the rear end so that when said rear end has a horizontal position the forward end 12 will incline upwardly. A keeper bracket, 13, is secured to the vertical side wall, 7, of the outer shell or scraper and the said bar or lever, 9, has position between said bracket and the outer side wall of the shell whereby to be protected and guided as it swings up or down.

In practice the forward and upwardly-inclined ends, 12, of the draft bars or levers, 9, are connected with chains or cables, not shown, which draw the entire excavator forward during the digging or excavating operation.

At the rear part of the side wall, 7, of



the shell I provide a vertical guard or bracket plate, 28, which, in the present instance has a plurality of perforations, 14, at or adjacent its upper end. These perforations are arranged in an arc of a circle having the pivot point, 10, of the draft lever, 9, for the center, and between the said plate and the side wall I mount a pivoted dog, 15, having a down-turned forward end, 16, with a notch, 17, at its extremity. The notched end of this dog or lever has a position where it can be swung over the rear end of the draft lever, 9, when the latter is depressed and in substantially a horizontal plane so as to hold the said rear end down and the forward end 12 up. When in this position the cables (not shown) connected to the draft levers will have a downward pull on the inclined front end of the scraper and thus keep the plow teeth, 5, down in the soil while the vehicle is being drawn forward to load the same. When however, the shell has become sufficiently filled it is desirable that the transportation of the load be accomplished with as little resistance as possible and to effect this the dog, 15, is tilted so as to disengage its notch end, 17, from the rear end of draft lever, 9, whereupon said rear end will swing up; the forward end thereof will drop and the vehicle will then tilt on the rocker bottom, 1, because the pull will then be more direct and the plow teeth, 5, being raised will ride over the surface instead of beneath the latter.

In operation the release of the draft bar or lever, 9, by the dog, 15, is automatically effected when the front end of the excavator shell reaches a predetermined depth in the soil so that upon such release the said front end will then be drawn toward and will ride over instead of beneath the surface. To effect this automatic operation of the dog I provide a shaft, 18, at the front end of the excavator shell which shaft extends horizontally between the opposite side walls, 7, and is sustained by its ends entering collars or bushings, 19, that are carried on the inner ends of short shafts, 20. These short shafts, see Figs. 7, 8 and 9 of the drawings, pass through suitable openings in the walls, 7, of the shell and project outwardly beyond the same. The extreme outer end of each short shaft is sustained or supported by means of a vertically-extending bracket plate, 21, the lower end of which latter is rigidly sustained from the side wall 7 of the outer shell, 4, as seen in Figs. 1 and 5 and between said bracket and side wall each shaft has a square head, 22, for a purpose presently to be described.

Bars, 23, extend horizontally along the upper edge and at the opposite sides of the shell and the forward end of each bar has a perforation corresponding in square shape to the shape of the head, 22, on the short shaft

so that said perforation will receive the latter and by this means the said forward end of each bar is sustained. The bars, 23, extend rearwardly from the short shafts 20 and pass between the side wall and the bracket plates, 13, which keep them from lateral displacement. The rear end of each bar, 23, is provided with a slotted head, 24, which receives the forward end of a rock bar, 25, which is jointed or pivotally connected thereto by means of a stud or pin, 26, which extends through horizontal slots, 27, in the head, 24. The rock bar, 25, extends between the bracket plate, 28, and the side wall of the shell and a stud or bolt, 29, projects through all of said parts to pivotally sustain the rock bar and permit the same to be rocked in a vertical plane. The rear free end of the rock bar carries a link plate, 30, which has its upper end pivoted thereto by means of a suitable pin, 31, so that its lower end may depend and be engaged with the rear end of the dog or lever, 15,—a pin, 32, connecting the two together.

By referring to Fig. 7, it will be noted that a collar, 33, is provided on the short shaft, 20, between the side wall of the shell and the forward end of the bar, 23, and that a brace bracket, 34, extends around the said collar and is sustained from the shell wall to aid in supporting the short shaft. It will also be noted that a pin or bolt, 35, extends through collar, 19, and also through the short shaft, 20, whereby to rigidly connect the two.

The horizontal shaft, 18, that has its ends sustained in the collars, 19, is held rigid with the latter by means of suitable set bolts, 36, so that said shaft, 18, collar, 19, and short shaft, 20, may all be rocked together.

The shaft, 18, carries one or more forwardly-projecting actuating devices which, in the present instance, have the form of aprons, 37. Preferably, these aprons have one end, 38, rigidly secured to the horizontal shaft, 18, and from said shaft they incline downwardly and forwardly and have a curled-up front portion, 39, which moves forward with but in advance of the shell during the excavating operation. It will be understood that the curled-up front portion, 39, of the apron may be adjusted with respect to the bottom of the outer shell by simply loosening the set bolts, 36; turning the horizontal shaft, 18, to raise or lower the aprons and then setting the bolts again. Thus the lowermost position to which the aprons may fall may be regulated so that the space between the bottom of the shell and the aprons may be varied. By means of this construction when the excavator is drawn forward the teeth, 5, will enter the soil because of the downward pull of the hauling cable on the forward inclined ends of the bars, 9. This downward course of the shell into the soil



will continue and when it has reached a depth that will cause the curled front portions 39 of the aprons to travel along the surface of the ground the apron will be held against further downward movement and consequently the shell in going deeper into the soil will cause the shaft, 18, to which the aprons are attached to turn at the same time turning sleeve, 19; short shaft, 20, and the head, 22, on said shaft. As the squared head, 22, cannot turn in the opening at the forward end of the bar, 23, said bar will have to swing with the shaft and the result is that the rear end of the bar will move down slightly breaking the joint at the stud, 26, and throw the front end of rock bar, 25, down and the rear end of said bar up so as to draw the link plate, 30, and rear end of the dog, 15, upwardly to release the rear end of bar, 9, from the notch, 17, of the dog. Upon thus releasing the rear end of bar, 9, the forward end thereof will lower so as to change the angle of the pull by the hauling cable and the result will be that as the pull becomes more direct the forward end of the shell will rise.

A removable shell or receptacle fits into the outer shell and comprises a bottom, 40, opposite side walls, 41, and a rear wall, 42. This removable or inner shell is open at the front end and the top and is provided at its upper corners with suitable rings, 43, to which chains or cables may be attached to lift it entirely out of the outer shell. The outer shell has horizontal angle plates, 44, riveted to its bottom and side walls and vertical angle plates, 45, connecting the side and rear walls and the inner shell is confined between these angle plates. A vertical angle plate, 46, is also attached to the side walls of the outer shell in front of the open end of the inner shell, see Fig. 3, so that said inner shell may not be drawn forward independently of and while in the outer shell. A flat metal strip, 47, is also attached to the front and under side of the bottom of the inner shell so as to fill the space between the bottom of the two shells at the front end and thereby prevent dirt from working into such space.

The opposite side walls, 41, of the inner shell are provided with angle guide plates, 48, which extend horizontally along their upper edges, as seen in Figs. 3, 4 and 5, which serve a useful purpose as will presently be explained.

A false or movable back, 49, is provided in the inner shell which back extends from the bottom to top of the said inner shell and is provided with notches, 50, at its corners to permit it to fit around the angle plates which extend along the top and bottom of said inner shell and to enable it to closely hug the side walls and bottom of said inner shell. Plates, 51, are riveted to the front

side of the false back and extend forwardly therefrom and in close proximity to and parallel with the side walls. These angle plates are secured to the false back so as to extend upwardly from the bottom thereof and so that they may project forward and rest upon the bottom angle plates of the inner shell, as best seen in Figs. 3, 4 and 6 of the drawings. Suitable horizontal bars, 52, extend across and are rigidly secured to the front side of the false or movable back and said bars are provided with loops or eyes, 53, by means of which a chain, 54, may be attached thereto, as shown in Fig. 2, which chain has a ring, 55, at its outer end that is normally passed over a hook, 56, on the bottom of the outer shell to hold it in place during the excavating operation. If the chain were not so held it would be carried back toward the rear of the inner shell by the incoming soil and would thereby be covered but by securing the front end of the chain as described the said end may readily be engaged by a cable to draw it and the false back forward through the inner shell to discharge the load by pushing the same outward at the open front end when the shells have been drawn to a place where it is desired to unload without removing the inner shell from the outer one.

The false or movable back, 49, has a central perforation, 57, see Figs. 10, 11 and 12, around which a perforated plate, 58, is seated and suitable blocks 59, are attached to the front side of the plate, 58, but spaced centrally from each other so as to form a key-way, 60. A cover plate, 61, is placed over the blocks so as to cover the key way and bolts or rivets, 62, secure all of said parts to the false back as clearly seen in Fig. 11. A stem, 63, passes through the false back then through the plate, 58, and between blocks, 59, and finally through the cover plate and said stem has a key-way extending vertically therethrough to receive a key, 64, that secures the stem in rigid relation to the false back. The other end of the stem passes or projects through a vertical slot, 65, in the rear wall 8 of the outer shell and has a hook, 66, formed thereon so that a cable, rope or chain may be attached to said hook, 66, for the purpose of drawing said false back, 49, rearwardly into its place after said back had moved forward to discharge the load.

The rear closed end of the outer shell is provided with plow teeth, 67, which are pivotally sustained on a horizontal shaft, 68, so they may swing in a vertical plane. The teeth are provided with a notched upper side to permit them to project slightly beneath the bottom of the outer shell when they are in the lowered position and during the rearward movement of the shell and after the load has been dumped these teeth



will plow up the soil. When desired the plow teeth may be turned upwardly and engaged by a pivoted band, 69, to hold them in the elevated position over the shaft, 68.

5 It will thus be seen that by means of the device above described the excavation of soil and the loading of the shell may be accomplished by dragging the device in one direction and that the depth of the cut may  
10 be regulated by means of the aprons at the forward end. It will further be seen that the load may readily be discharged at the front open end of the shells by drawing the false back 49 forward,—the return of the  
15 false back being effected by means of cables or other devices attached to the stem 63 at the rear of the false back. Also it will be noted that the inner shell and its false back may readily be lifted from the outer shell  
20 and that the slot, 65, in the rear wall of the outer shell will permit this to be done without removing the stem, 63.

Having thus described my invention what I claim and desire to secure by Letters Patent is,—

25 1. In an excavator the combination of a shell open at one end; a pivoted draft-bar positioned at two opposite sides of said shell; a dog that engages one end of each  
30 draft-bar and holds it during the loading of the shell; an apron positioned at the open end of the shell to be moved only by the earth when the shell has cut into the soil to a predetermined depth, and means operating  
35 between said apron and dog to release the latter.

2. In an excavator the combination of a shell having an open end and a bottom which inclines downwardly from both the  
40 open end and the opposite end to the center and thereby forms a rocker; draft bars pivotally mounted at the sides of said shell and having their ends movable up and down; means for holding said bars in one position  
45 while the open end of the shell is tilted down and moving in the direction to load; an apron positioned at the open end of the shell to be moved only by contacting with the earth; and means operating between said  
50 apron and the said means for holding the draft-bars to release the latter means.

3. In an excavator the combination with a shell open at one end, of draft bars pivotally mounted with respect to said shell;  
55 means for engaging the bar at one side of the pivot to hold the same in a given position during loading of the shell; pivoted means at the open end of the shell for determining the depth of the cut into the earth  
60 and means operating between said pivoted means and the bar engaging means to release the latter.

4. In an excavator the combination with a shell open at one end, of draft bars pivotally mounted with respect to said shell;

means for engaging the bar at one side of the pivot to hold the same in a given position during loading of the shell; a shaft at the open end of the shell; means attached to said shaft and projecting forwardly therefrom to determine the depth of the cut into the earth and means actuated by said shaft and coacting with the bar-engaging means to move the latter.

5. In an excavator the combination with a shell open at one end, of draft bars pivotally mounted to said shell and having their ends movable up and down; a dog for engaging one end of the draft bar to hold the opposite end in an elevated position during  
75 loading of the shell; means at the open end of the shell to engage the surface of the soil when the predetermined depth of cut has been made and means coacting between said latter means and said pivoted dog to operate the latter and release the bar.

6. In an excavator the combination with a shell open at one end, of draft bars pivotally mounted at the side of the shell and having one end turned at an angle with respect to the other; means for engaging said bar to hold the same during the loading of the shell; a shaft extending across the front of the shell; aprons attached to the shaft and extending downwardly and forwardly  
90 therefrom; bars extending along the side of the shell and movable by the said shaft and means coacting between said latter bars and the said bar-engaging means to release the latter.

7. The combination in an excavator of an outer shell open at one end and at the opposite end having a wall provided with a vertical slot open at its top; an inner shell within said outer shell and having an open end  
105 coincident with the open end of the outer shell and a rear wall opposite said open end; and a stem provided with a hook and projecting rearwardly from said rear wall of the inner shell and through the vertical slot  
110 in the wall of the outer shell.

8. The combination in an excavator of an outer shell open at one end and at said end provided with a hook, 56, on the bottom; an inner shell within the said outer shell and  
115 having an open-end coincident with the open end of the outer shell; means preventing the inner shell from moving forward but permitting it to be lifted upward and out of said outer shell; a false back fitted in the  
120 inner shell to move toward its open end, and a chain attached to the said false back and therefrom extending forward and engaging the said hook at the open end of the outer shell.

9. The combination in an excavator of an outer shell open at one end and at the opposite end having a wall provided with a vertical slot open at its top; an inner shell within said outer shell and having an open end co-  
130



incident with the open end of the outer shell  
and a rear wall opposite said open end; a  
false back fitted in the inner shell to move  
forward to its open end; a stem provided  
5 with a hook and attached to said false back  
and projecting rearwardly through the rear  
wall of the inner shell and also through the  
said vertical slot in the wall of the outer  
shell, and a chain attached to said false back

and therefrom extending forward to the 10  
open end of the outer shell.

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

RICHARD P. McCORMICK.

Witnesses:

M. W. McCORMICK,  
J. H. MILLER.

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

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