

Oct. 4, 1938.

J. M. POCHÉ

2,132,184

DREDGE OR EXCAVATOR

Filed Oct. 13, 1937

6 Sheets-Sheet 1

Fig. 1.

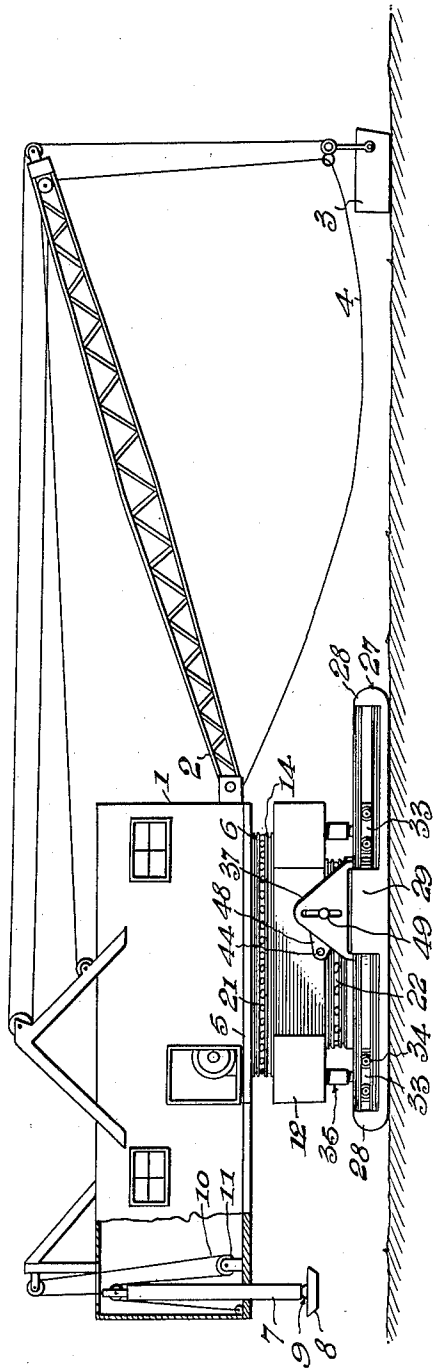


Fig. 3.

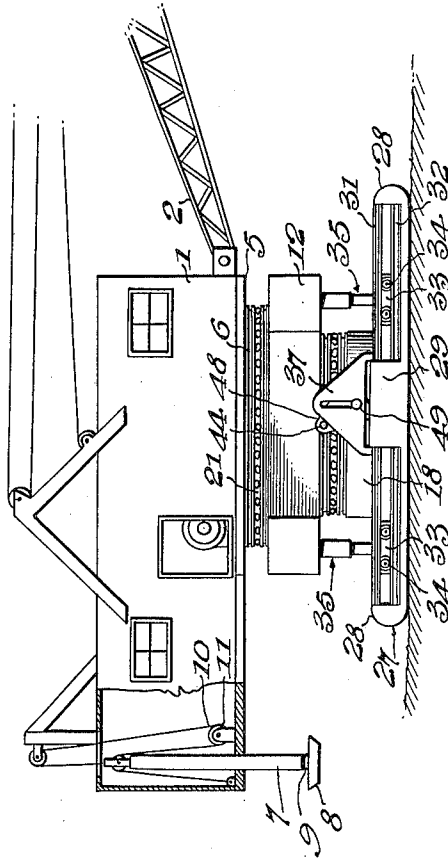
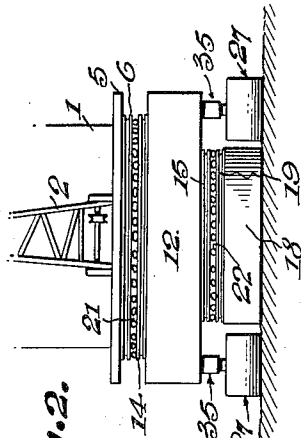


Fig. 2.



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6 Sheets—Sheet 2

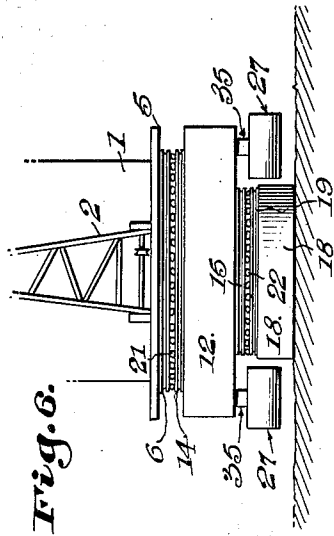


Fig. 6.

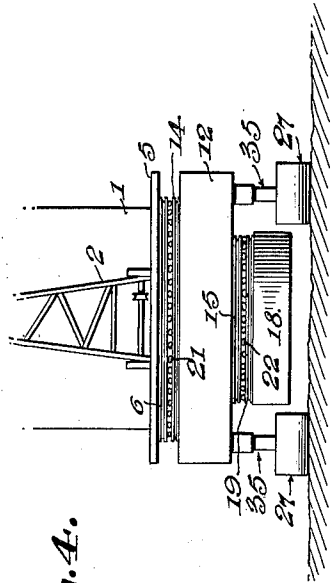


Fig. 4.

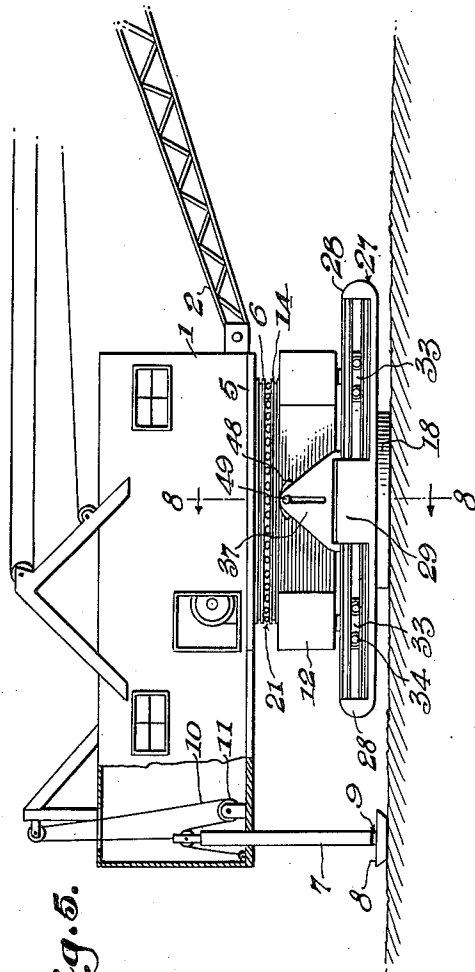


Fig. 5.

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6 Sheets—Sheet 3

Fig. 9.

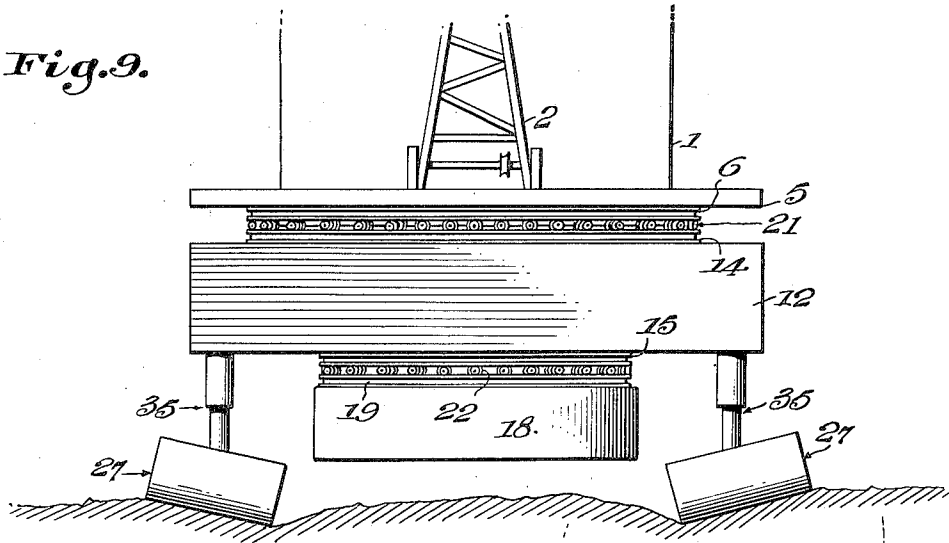


Fig. 7.

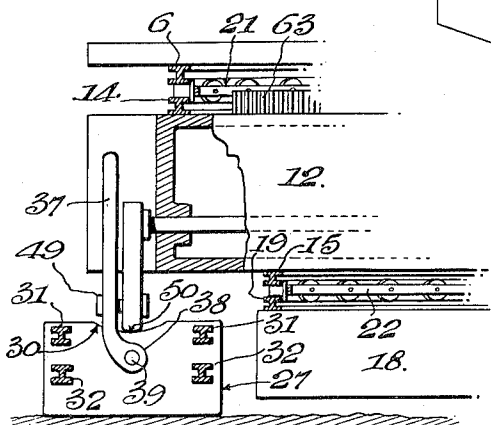
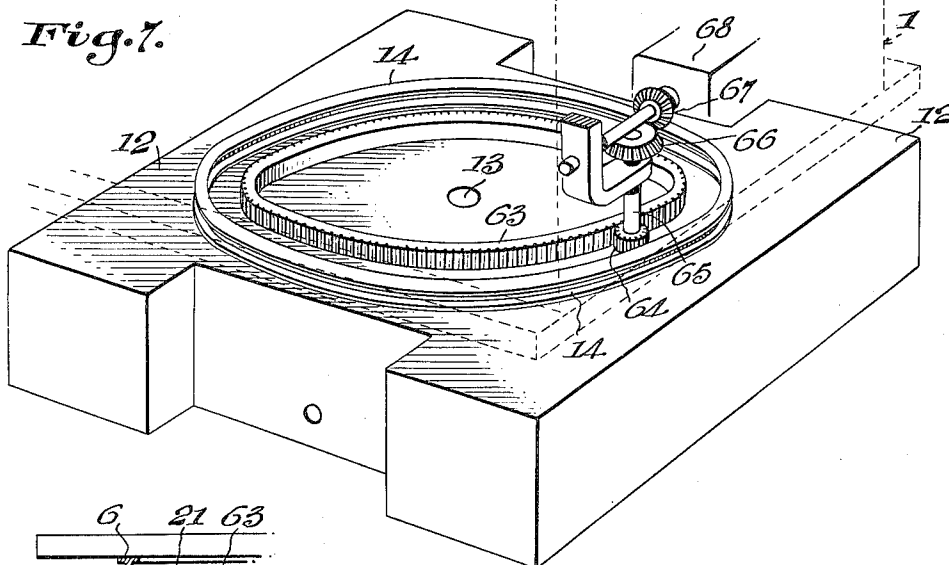


Fig. 10.

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Fig. 8.

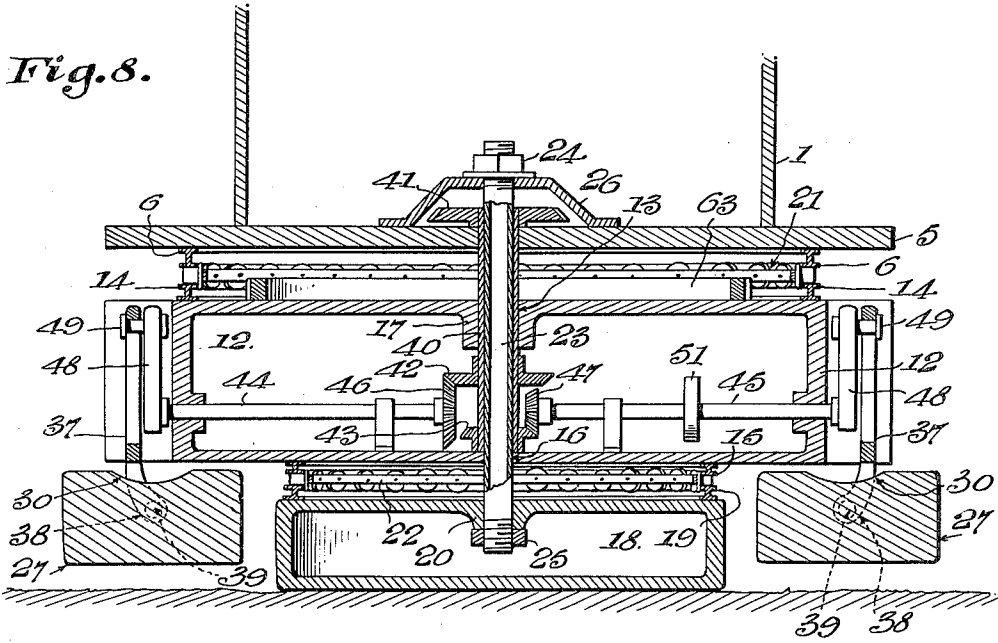


Fig. 11.

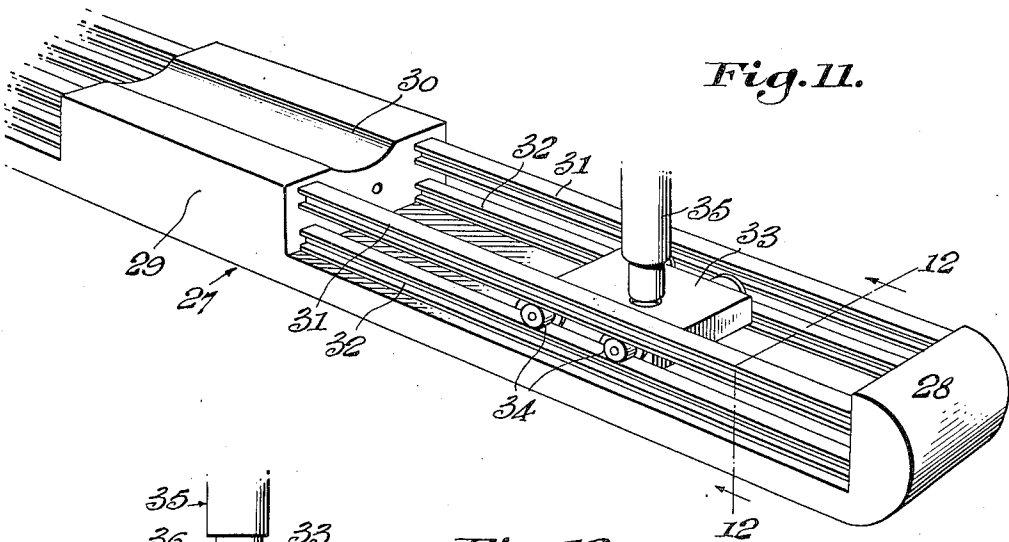
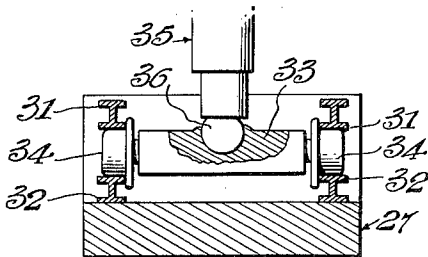


Fig. 12.



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Fig. 14.

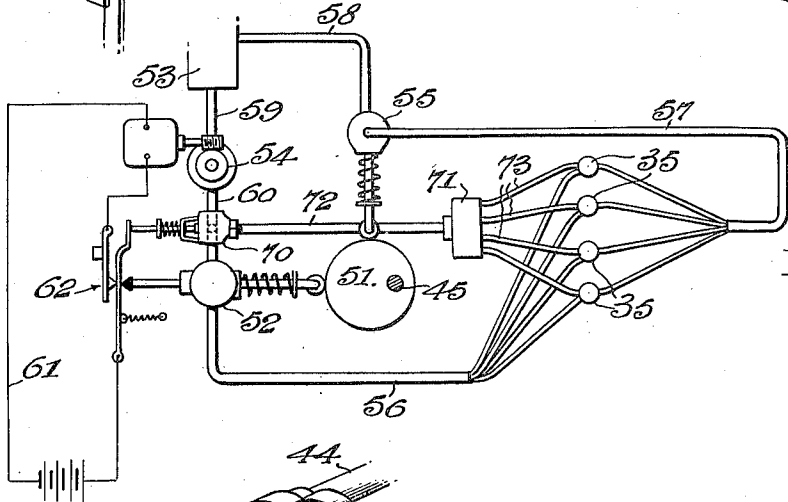
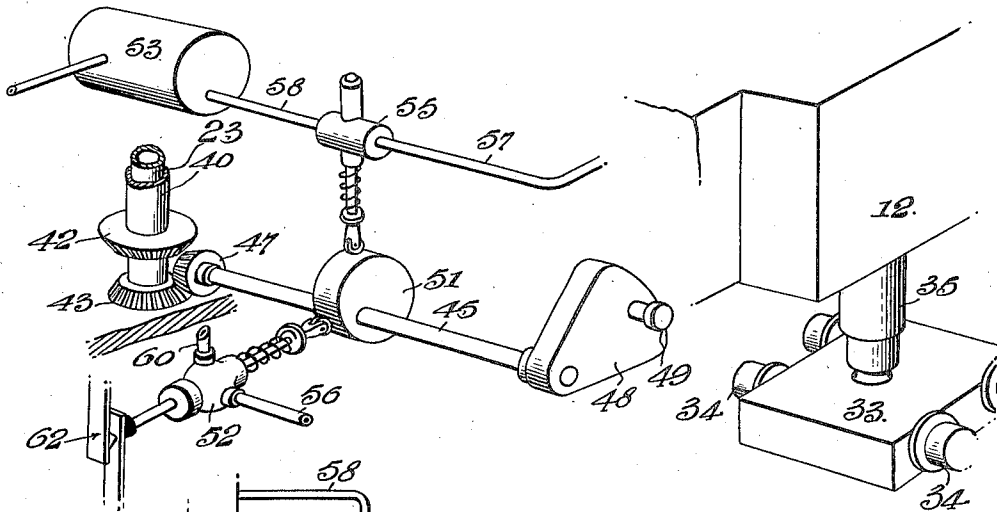


Fig. 15.

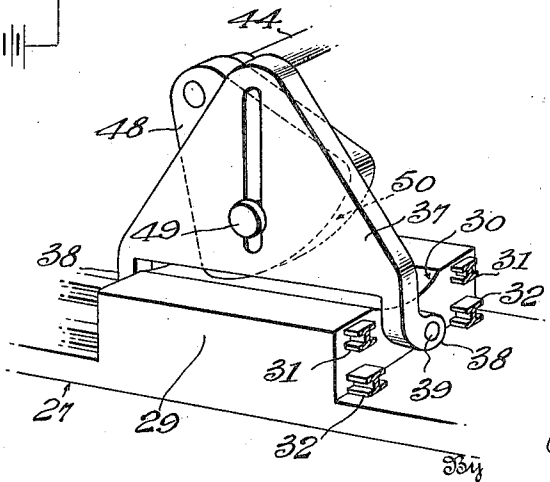


Fig. 13.

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Fig. 16.

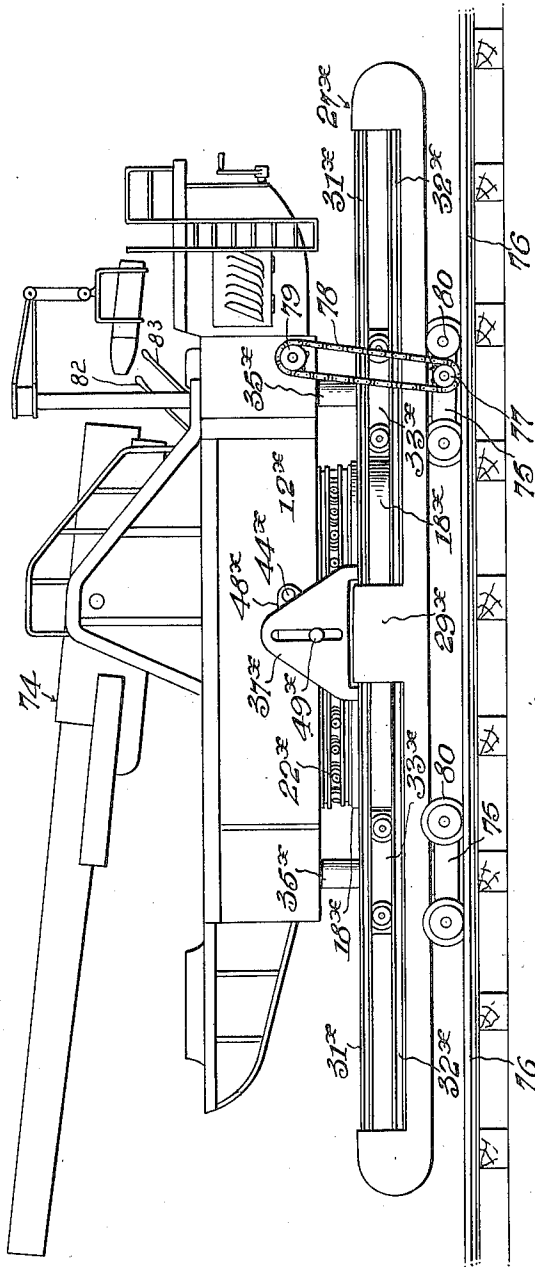
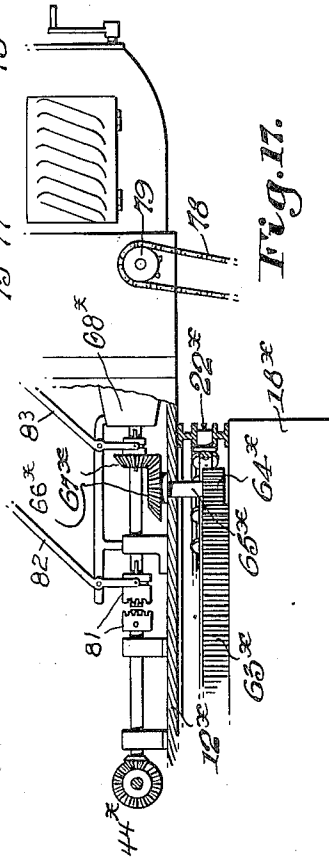


Fig. 17.



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UNITED STATES PATENT OFFICE

2,132,184

DREDGE OR EXCAVATOR

John Morris Poché, New Orleans, La., assignor of one-third to Walter Charles Gonthier and one-third to Christian Joseph Neunier, both of New Orleans, La.

Application October 13, 1937, Serial No. 168,809

23 Claims. (Cl. 180—8)

My invention relates to certain new improvements in drag-line and clam-shell dredges or excavators by which the movements of the dredge, forwardly, backwardly and turning, are greatly facilitated.

Heretofore dredges of this character have been provided with what is called a "tub"—a turning tub on which the excavator proper rests while at work and which tub is made to partly lift from the ground by the dredge operator, causing portable pontoons to be lowered. These pontoons are usually carried on the sides of the dredge and are kept up on the sides while the dredge is at work, so that the tub supports the whole weight of the superstructure while the dredge is at work. This arrangement is open to various objections which it is an object of my invention to eliminate.

One of the objects of my invention is to provide a structure by virtue of which greater walking efficiency and turning movement of the dredge is made possible and the speed of operations may be increased.

Further, it is an object of the present invention to provide means whereby the whole under-structure of the dredge that goes to make up my apparatus, as well as the dredge proper, is supported on movable trucks carried by the pontoons, and operator-controlled means are provided to start the trucks moving along the pontoons while the pontoons stand still, so that the dredge proper and the aforesaid under-structure may be moved at will.

Further, it is an object to provide a machine of great flexibility of movement in any direction and of greater ease in standing on soft soil, by virtue of the concurrent use of both pontoons and the tub for supporting the weight of the machine.

Further it is an object to provide a machine wherein the power shafts which serve to assist in maneuvering the machine are not used to sustain the lift or weight of the machine, that function being performed in my machine by the hydraulic jacks, the axes having to lift the pontoons only. This enables me to use much lighter shafts than heretofore and aids in accomplishing another object of the invention, namely, the reduction of the weight of the machine and the cost of construction.

Further, it is an object to provide a machine which is self-leveling and which can be used on uneven ground or ground having both hard and soft spots, without having to stop for placing mats, making mats for placement, or stopping

work on account of sinking troubles in moving and working the machine.

Again, it is an object to provide a dredge or excavator in which, instead of mounting the dredge proper on the tub with a dolly interposed, the dredge proper is mounted on a bottom car which in turn is mounted on the tub (dollies being interposed between the dredge proper and the bottom car and between the bottom car and tub), the bottom car carrying the jacks and pontoons and shafts, cams, gearing, etc., for operating the same.

Further, the invention has for an object to provide a hollow king-pin for joining the dredge proper (upper car), the lower car and the tub together so they may turn on said pin as a vertical axis, each being adapted to be turned freely with respect to the others when desired, and to provide a main power or propeller shaft of tubular form to turn on said king-pin as a bearing, the said shaft extending from the top car only to the bottom of the bottom car.

Other objects will in part be obvious and in part be pointed out hereinafter.

To the attainment of the aforesaid objects and ends the invention still further resides in the novel details of construction, combination and arrangement of parts, all of which will be first fully described in the following detailed description, and then be particularly pointed out in the appended claims, reference being had to the accompanying drawings, in which:

Fig. 1 is a side elevation of a dredge constructed in keeping with my invention, the parts being positioned with tub and pontoons on the ground and hydraulic jacks energized to start lifting dredge.

Fig. 2 is a front elevation of a portion of the same.

Fig. 3 is a side elevation showing the position of the parts with the tub raised and the machine being moved forwardly on stationary pontoons.

Fig. 4 is a front elevation of a portion thereof.

Fig. 5 is a side elevation of the machine with the pontoons raised.

Fig. 6 is a front elevation of a portion thereof.

Fig. 7 is a detailed perspective view of the bottom car, portions of the top car being indicated in dotted lines, the swing engine of the top car being shown in full lines.

Fig. 8 is an enlarged detail cross-section on the line 8—8 of Fig. 5.

Fig. 9 is a detailed front elevation showing how

the machine accommodates itself to uneven and spotty ground.

Fig. 10 is a detailed cross-section and part elevation, later referred to.

5 Fig. 11 is a detailed perspective view of a portion of one pontoon and one car mounted on the same.

Fig. 12 is a cross-section on the line 12—12 of Fig. 11.

10 Fig. 13 is a detailed perspective view, later referred to.

Fig. 14 is a diagrammatic perspective view showing the relation between the hydraulic valve-controlling cam and its associated parts.

15 Fig. 15 is a diagrammatic view of the hydraulic circuit and the hydraulic pump's motor circuit cooperative with cam 51.

Fig. 16 is a side elevation, showing my invention adapted to use as a tractor for gun-carriages such as heavy ordnance pieces.

Fig. 17 is a detail view of a portion thereof.

20 In the drawings, in which like numerals of reference indicate like parts in all the figures, 1 designates the top car of the dredge proper, 2 the boom, 3 the bucket, and 4 the boom and bucket operating cables.

The top car 1 has a circular bearing base 5, the under side of which is provided with a dolly track 6.

30 At the rear the top car 1 carries a vertically adjustable spud pole 7 having a foot 8 joined to it by a ball-and-socket joint 9. The spud pole is raised and lowered by any suitable means under the operator's control, as for example, a cable 10, passed around guides and operated by a drum 11.

35 Below the top car 1 and above a tub 18 is located a bottom car 12, preferably square in plan view and having a top central bearing hole 13 and casting 17, and a bottom hole 16. On top of the car 12 has a dolly track 14 between which and dolly track 6 the dolly unit 21 is located.

The tub 18 has a dolly track 19 between which and dolly track 15 on the bottom car the dolly unit 22 is located.

45 The tub 18 is chambered, as is also the bottom car, and the tub has an apertured boss 20 through which the hollow (tubular) king-pin bolt or shaft 23 passes. This shaft 23 also passes through the bottom car 12 and through the base 5 and bracket casting 26, and carries securing nuts 24 and 25 on its ends, in virtue of which the parts 5, 21, 12, 22 and 18, respectively, are held together.

50 At each side of the machine is located a pontoon 27 consisting of an elongated foot-plate with turned-up ends 28 and a central block 29 whose upper face 30 is preferably concaved. Sets of upper and lower tracks 31, 32 extend each way from the block 29 to the ends 28, and carriages or trucks 33 run between the pairs of tracks 31—32 and 31—32, the trucks having suitable wheels 34 to run on tracks 32 and beneath tracks 31, the diameters of the wheel treads being only slightly less than the distance between tracks 31—32 to provide clearance.

65 Hydraulic jacks 35 are carried at each of the four corners of the bottom car 12, and these jacks are connected to the respective trucks 33 by ball-and-socket joints 36, for a purpose later to appear.

70 Vertically slotted guide plates 37 have ears 38 to straddle the ends of the blocks 29 to which they are secured by hinge pins 39 (see Figures 10 and 13).

75 Rotatable within the casting 17 and on the king-pin 23 is a tubular shaft 40 constituting the

main operating shaft. This shaft extends from within the top car 1 to within the bottom car 12 and carries at its upper end the master gear 41 to which operative power is applied from within the top car from any suitable source, in any well known way.

10 The main shaft 40 also carries driving gears 42 and 43 which mesh respectively with pinions 46 and 47 on the pontoon-operating shafts 44 and 45, respectively. The shafts 44 and 45 are in axial alignment transversely of the machine and turn in the same direction and at the same speed. These shafts 44 and 45 project through the recessed side walls of the bottom car and carry travel eccentrics 48 having wrist pins 49 that pass through the slots in the slotted guide plates 37. The peripheries of the eccentrics are formed as convex flanges 50 to ride on the concave surfaces 30 hereinbefore mentioned.

20 On one of the pontoon-operating shafts, 45, is a control cam 51 that operates a pressure-admitting and switch-operating valve 52 in the hydraulic line and that operates a pressure-release valve 55.

25 53 designates a suitable tank for the hydraulic fluid (preferably oil), and 54 indicates a hydraulic pump operated by a suitable motor (electric being shown for illustrative purposes only as any other suitable mechanism may be used to operate the pump).

30 The tank 53 connects with the pump 54 by a duct 59; the pump 54 connects with the valve 52 by duct 60; valve 52 connects by branches ducts 56 to the respective jacks 35, and they in turn connect with valve 55 by a branched duct 57; valve 55 connects with tank 53 by duct 58 (see Fig. 15). A supplemental pressure control valve 70 is connected to duct 60 and by a duct 72 to a pressure equalizing valve 71 that has four outlets 73 one to each jack. The valve 70 is set for a certain predetermined pressure, say 400 tons, 100 tons for each jack.

45 61 indicates the circuit which energizes the pumps and motor 69 and in which is a normally open circuit closer 62 that is arranged to be operated to close the circuit when valve 52 begins to open and keep the circuit closed while valve 52 remains open (see Fig. 15).

50 On the bottom car is a circular-segment gear 63 with which a pinion 64 on a shaft 65, carried by the top car, meshes. The shaft 65 is turned by bevel gears 66 and 67 driven by the swing engine 68 under control of the operator. By operating shaft 65 in one direction or the reverse, the top car can be turned on the bottom car, with the king-pin 23 as an axis, to swing the boom 2 laterally, as required in practice.

Operation

60 While the machine is being used to excavate, the tub 18 and pontoons 27 will be in pressure-contact with the ground (see Figs. 1 and 2). Now when the operator wishes to advance the dredge to another position, he causes power from the main engine (not shown) of the dredge to be applied to the gear 41 to turn the main operating shaft 40 in the required direction, thereby transmitting the proper motion to shafts 44 and 45. This causes the walking cams or travel eccentrics 48 to move from the position of Fig. 70 1 and Fig. 2 to the position of Fig. 3 and Fig. 4. In so moving cam 51 opens valve 52 and sets pump 54 into action, thereby forcing jacks to raise the tub 18 and its superstructure until the tub 18 clears the ground when cam 51 leaves 75

valve 52. Valve 52 immediately closes and causes the pump to stop by allowing its circuit closer 62 to open the circuit.

Continued rotation of shaft 40 moves the machine on the trucks 33 by shaft 40 rotating the bevel gears 42—46 and 43—47, which gears rotate the shafts 44—45. These shafts rotate the eccentrics 48. Wrist pins 49 on eccentrics 48 are thus caused to move up and down in the slots of the plates 37. It should now be plain to see that as eccentrics 48 are turned and pontoons 27 and blocks 29 in pontoons 27 are anchored on the ground, the device moves forwardly or backwardly, as the case may be, depending on which direction shafts 44—45 are rotated. This is particularly so by reason of all the weight of the machine, except that of the pontoons, at this time being held in a raised position by the hydraulic jacks. As shafts 44—45 and the eccentrics 48 continue to rotate, their convex ends solidly contact the upper concave surfaces 30 of the blocks 29 in the pontoons 27 and the resistance offered by the now solidly anchored pontoons along with the vertically slotted guide plates 37 that are secured to the blocks 29 by the hinge pins 39, the top car 1, bottom car 12 and the tub 18 and their appurtenances are pushed along on the trucks 33 and wheels 34 between tracks 31—32 and 31—32 inside the pontoons 27. It is at once obvious, under the stated circumstances, that as the eccentrics 48 move their wrist pins 49 with sufficient force against the sides of the slots in guides 37 in an up and down direction in these guides, the machine cannot but move forwardly or backwardly, as the case may be. This becomes especially true because in the walking position none of the weight of the device is upon the eccentrics 48, the shafts 40, 44 and 45 or wrist pins 49, there then being required, for moving the machine either forwardly or backwardly, only a comparatively slight pushing or pulling force, as the case may be, which is easily exerted by the eccentrics 48. Continuation of rotation of shaft 40, however, causes eccentric wrist pin 49 to raise the pontoons 27 (telescoping the jacks) to the position shown in Fig. 5 and move the pontoons forwardly, ready for the next move. The raising of the pontoons occurs when pin 49 reaches the end of the slot in 37 (Fig. 13) and lifts 37 which is attached at 39 to blocks 29 of the pontoons 27 (see Fig. 8). The pontoons are then moved forwardly (or backwardly, as the case may be) by 49 pressing against the side of the slot of 37, the tub 18 resting on the ground at this time.

By stopping rotation of the shaft 40 when travel eccentrics are at top position (Fig. 5) and lowering spud pole 7 to cause its foot 8 to ground, the machine resting now on tub 18, the top car will be held stationary, so by turning shaft 65 (and, if found desirable, applying any suitable known type of brake to shaft 44 or 45 to hold the same against accidentally turning and dropping the pontoons prematurely) the operator can turn the bottom car 12 on its axis and hence direct the raised pontoons 27 to one side or the other for the purpose of changing the direction of travel.

When the machine is walking forwardly or backwardly the equalizing valve 71 is cut off by the operator so that the jacks may be operated automatically as a unit by cam 51 controlling valves 52 and 55. But when the machine is stationary and working the equalizing pressure valve is automatically set so that with any sink-

ing or change of elevation of the four corners of the machine the jacks are automatically motivated by the equalizing valve and pressure to keep taut, or take up the developing slack.

From the foregoing it will be seen that the centered spreading of weight permits my apparatus to do what other machines cannot do, to wit: stand on both side pontoons at the same time, the machine to stand on the tub and be operative in that position. The hydraulic jacks at the four corners of the machine are designed to exert pressure enough to hold the machine level at all times, no matter upon what type of terrain or ground the machine is working.

This double use of pontoons and tub makes possible using the machine without building and placing mats for soft ground, boggy places and swampy places, which all previous machines must resort to in their operation or sink so low as to hinder or stop operation altogether.

The use of a hollow shaft or king-pin enables me to run electric cables, oil lines, water lines, etc., through the shaft from the tub (where service taps can be made) up to the top of the car.

In Fig. 16 and Fig. 17 I have shown the invention adapted as a tractor for gun-carriages such as heavy ordnance.

In these figures 18^x is the turn tub, which in this case carries the gear 63^x with which the pinion 64^x on shaft 65^x meshes. Shaft 65^x is driven from the swing engine 68^x through bevel gears 66^x and 67^x. The swing engine 68^x, gears 66^x and 67^x, shaft 65^x and pinion 64^x in this embodiment of the invention are carried by the other parts which bear the same reference numerals in Fig. 16 plus the index letter "x", are of the same construction and operate the same way as similarly numbered parts in the preceding figures so a detailed repetition of the description thereof is thought unnecessary.

With this embodiment of the invention wheeled railway trucks 75 adapted to run on rails 76 are provided to receive and be suitably detachably secured to the pontoons 27^x so the machine may be pulled along a railroad by an engine or, as shown in the drawings, wheels 80 of the trucks 75 may be driven through sprockets 77 (geared to the wheels 80) and chains 78 from sprockets 79 on car 12^x which sprockets 79 are driven, in any suitably controlled and known way, from the main engine of the machine.

In order to permit the gun 74 to be elevated the carriage 12^x may have a slot or recess (not shown) below the breech end of the gun, if necessary.

With the gun at rest or being fired it will sit on the pontoons and tub.

When it is desired to transport the gun from one place to a distant point by railroad the machine will be moved to a point up on the railroad by its own mechanism and the railroad trucks be placed under the machine and the machine lowered upon the trucks and then bolted to the trucks, when it is ready to travel once the tub is lifted clear of the ground. The reverse of this action is used to track the machine off the railroad, the first action being to lower the tub on track and removing railroad trucks, when the regular action of the machine in its walking action will take it off the track. Once upon the railroad and bolted to the railroad trucks, the chains 78 are attached if the machine is to travel on the rails by its own power. If it

is not to travel by its own power it may be propelled or drawn by other motive power, a gasoline tractor or steam locomotive or other suitable propelling means.

5 When not on the railroad trucks the machine is caused to travel in the same way as the machine of the preceding figures of the drawings, so a repetition of the description of that operation is thought to be unnecessary here.

10 In Fig. 17, is shown a means to drive shaft 44^x from swing engine 68^x. By using lever 82 to shift clutch parts 81 into mesh, shaft 44^x will be driven. When shaft 44^x is to be driven lever 83 is used to shift gears 67^x out of mesh. When 15 67^x is meshed with gears 66^x clutch 81 is thrown out and vice versa.

Other advantages of the invention will readily appear to those skilled in the art.

20 While I have, for illustrative purposes, shown but two embodiments of the invention, it is obvious that various other modifications and changes in the details of construction, combination, design and arrangement of parts can be made without departing from the spirit of the 25 invention or the scope of the appended claims.

What I claim is:

1. In a machine of the class described, a top car, a bottom car, a tub, dolly units between 30 said top and bottom cars and between said bottom car and said tub, a king-pin connection between the top car, the bottom car and the tub, pontoons one on each side of the machine, said 35 pontoons having tracks, trucks carried by said pontoons' tracks, hydraulic levelling jacks connecting said trucks to said bottom car, and operator-controlled powered mechanism for actuating said jacks and for causing travel of said 40 trucks and pontoons forwardly and backwardly according to the direction in which the machine is to be transported.

2. In a machine of the class described, a tub, a bottom car mounted on said tub for swivel 45 movement about a vertical axis, a top car mounted on said bottom car for like swivel movement, said top car constituting a dredge proper, means 50 to cause relative swivel movement between the top and bottom cars, means to connect said top and bottom cars and said tub together as a unit, and means cooperating with said bottom car for lifting said cars and said tub clear of the ground, 55 and means to carry said lifted top and bottom cars and said tub as a unit over the ground.

3. In a machine of the class described, a tub, a bottom car mounted on said tub for swivel 60 movement about a vertical axis, a top car mounted on said bottom car for like swivel movement, said top car constituting a dredge proper, means to cause relative swivel movement between the 65 top and bottom cars, means to connect said top and bottom cars and said tub together as a unit, means cooperating with said bottom car for lifting said cars and said tub clear of the ground, and to carry said top and bottom cars and said tub as a unit over the ground, said last named 70 means including pontoons, hydraulic jacks and trucks between each end of each pontoon and said bottom car, and tracks along said pontoons on which said trucks travel, and means causing travel of said trucks along said pontoons and said pontoons along said trucks.

4. In a machine of the class described, a tub, a bottom car mounted on said tub for swivel 75 movement about a vertical axis, a top car mounted on said bottom car for like swivel movement, said top car constituting a dredge proper, means

to cause relative swivel movement between the top and bottom cars, means to connect said top and bottom cars and said tub together as a unit, means cooperating with said bottom car for lifting 5 said cars and said tub clear of the ground, and to carry said top and bottom cars and said tub as a unit over the ground, said last named means including pontoons, hydraulic jacks and trucks between each end of each pontoon and 10 said bottom car, tracks along said pontoons on which said trucks travel, means causing travel of said trucks along said pontoons and said pontoons along said trucks, means carried by said top car to engage the ground, and means for 15 turning said bottom car on a vertical axis during such engagement for purposes described.

5. In a machine of the class described, a dredge proper constituting a top car, a bottom car of 20 rectangular plan located beneath said top car, said cars having opposed dolly tracks, a dolly unit between said cars to engage said tracks, a tub located beneath said bottom car, said bottom car and said tub having opposed dolly tracks, a dolly unit between said bottom car and said tub, a tubular king-pin device joining said cars and 25 tub for turning on said pin as an axis, said bottom car having a bearing, a tubular main shaft in said bearing and on said king-pin, said bottom car being chambered, a driving gear on said main shaft in said top car, cross shafts carried by said 30 bottom car, gear connections between said main and driven shafts for driving the driven shafts together in the same direction and at the same speed, hydraulic jacks depending from the sides of said bottom car and spaced on quarters, a 35 pontoon at each side of the tub beneath the bottom car, trucks travelling along said pontoons and attached to said jacks with ball and socket joints, and means operated by said cross shafts for causing travel between said trucks along said 40 pontoons when said jacks have lifted said tub and the superstructure to clear the ground, and to lift and carry said pontoons over the trucks when said jacks have lowered the machine to rest on said tub.

6. In a machine of the class described, a dredge 45 proper constituting a top car, a bottom car of rectangular plan located beneath said top car, said cars having opposed dolly tracks, a dolly unit between said cars to engage said tracks, a 50 tub located beneath said bottom car, said bottom car and said tub having opposed dolly tracks, a dolly unit between said bottom car and said tub, a king-pin device joining said cars and tub for turning on said pin as an axis, said bottom car 55 having a bearing, a tubular main shaft in said bearing and on said king-pin, said bottom car being chambered, a driving gear on said main shaft in said top car, cross shafts carried by said bottom car, gear connections between said main 60 and driven shafts for driving the driven shafts together in the same direction, hydraulic jacks depending from the sides of said bottom car and spaced on quarters, a pontoon at each side of the tub beneath the bottom car, trucks travelling 65 along said pontoons and attached to said jacks with ball and socket joints, and means operated by said cross shafts for causing travel between said trucks along said pontoons when said jacks have lifted said tub and the superstructure to 70 clear the ground, and to lift and carry said pontoons over the trucks when said jacks have lowered the machine to rest on said tub.

7. In a machine of the class described, a 75 dredge proper constituting a top car, a bottom

car of rectangular plan located beneath said top car, said cars having opposed dolly tracks, a dolly unit between said cars to engage said tracks, a tub located beneath said bottom car, said bottom car and said tub having opposed dolly tracks, a dolly unit between said bottom car and said tub, a king-pin device joining said cars and tub for turning on said pin as an axis, said bottom car having a bearing, a tubular main shaft in said bearing and on said king-pin, said bottom car being chambered, a driving gear on said main shaft in said top car, cross shafts carried by said bottom car, gear connections between said main and driven shafts for driving the driven shafts together in the same direction and at the same speed, hydraulic jacks depending from the sides of said bottom car and spaced on quarters, a pontoon at each side of the tub beneath the bottom car, trucks travelling along said pontoons and attached to said jacks with ball and socket joints, means operated by said cross shafts for causing travel between said trucks along said pontoons when said jacks have lifted said tub and the superstructure to clear the ground, and to lift and carry said pontoons over the trucks when said jacks have lowered the machine to rest on said tub, said last named means including travel eccentrics on said cross shafts and having wrist pins, and vertically slotted guide plates on said pontoons in the slots of which said wrist pins lie.

8. In apparatus of the class described, a dredge proper comprising a top car, a bottom car beneath the top car, a tub beneath the bottom car, a vertical king-pin joining the aforesaid parts for turning about the pin as an axis, pontoons carried by said bottom car at each side of the machine, combined with means including jacks for holding the pontoons in contact with the ground while said tub is on the ground and serving to level the cars and maintain them levelled, said top car being free of said pontoons to turn on its axis during dredging or excavating operations.

9. In apparatus of the class described, a dredge proper comprising a top car, a bottom car beneath the top car, a tub beneath the bottom car, a vertical king-pin joining the aforesaid parts for turning about the pin as an axis, pontoons carried by said bottom car at each side of the machine, combined with means including jacks for holding the pontoons in contact with the ground while said tub is on the ground and serving to level the cars and maintain them levelled, said top car being free of said pontoons to turn on its axis during dredging or excavating operations, means to raise the tub and parts carried thereby clear of the ground and support the same on said pontoons, and means to carry the raised structure along said pontoons.

10. In apparatus of the class described, a dredge proper comprising a top car, a bottom car beneath the top car, a tub beneath the bottom car, a vertical king-pin joining the aforesaid parts for turning about the pin as an axis, pontoons carried by said bottom car at each side of the machine, combined with means including jacks for holding the pontoons in contact with the ground while said tub is on the ground and serving to level the cars and maintain them levelled, said top car being free of said pontoons to turn on its axis during dredging or excavating operations, and means to raise said pontoons and carry them alongside the machine to advanced positions for purposes described.

11. In apparatus of the class described, a dredge proper comprising a top car, a bottom car

beneath the top car, a tub beneath the bottom car, a vertical king-pin joining the aforesaid parts for turning about the pin as an axis, pontoons carried by said bottom car at each side of the machine, combined with means including jacks for holding the pontoons in contact with the ground while said tub is on the ground and serving to level the cars and maintain them levelled, said top car being free of said pontoons to turn on its axis during dredging or excavating operations, means to raise and lower the tub and superstructure clear of the ground, and to carry the tub and superstructure when said pontoons are down and when said tub is raised, along said pontoons and, when said pontoons are raised and said tub rests on the ground, to carry said pontoons alongside the machine to another position.

In apparatus of the class described, a dredge proper comprising a top car, a bottom car beneath the top car, a tub beneath the bottom car, a vertical king-pin joining the aforesaid parts for turning about the pin as an axis, pontoons carried by said bottom car at each side of the machine, combined with means for holding the pontoons in contact with the ground while said tub is on the ground to aid in supporting the machine, said top car being free of said pontoons to turn on its axis during dredging or excavating operations, means to raise said pontoons and carry them alongside the machine to advanced positions for purposes described, means to hold said top car against turning when said cars and tub are supported wholly by said tub, and means whereby said bottom car with the pontoons can be turned on its axis to change the direction of travel of the machine, said bottom car being mounted on said tub to turn thereon freely.

13. In a machine of the class described, a tub, a bottom car, a top car, a vertical king-pin device connecting said cars and tub to turn on a common vertical axis, travelling pontoons connected to said bottom car, means for raising and lowering said pontoons with respect to the ground for lowering and raising said tub and the parts carried thereover, hydraulic jacks connecting the bottom car and the pontoons at the front and back sections of the pontoons, and means to energize said jacks hydraulically, and to cause said jacks to act as levelers for the machine.

14. In a machine of the class described, a tub, a bottom car, a top car, a vertical king-pin device connecting said cars and tub to turn on a common vertical axis, travelling pontoons connected to said bottom car, means for raising and lowering said pontoons with respect to the ground for lowering and raising said tub and the parts carried thereover, hydraulic jacks connecting the bottom car and the pontoons at the front and back sections of the pontoons, means to energize said jacks hydraulically, and to cause said jacks to act as levelers for the machine, and means to carry the machine along said pontoons when said tub is off the ground and to carry said pontoons when said tub is on the ground and the jacks are raised.

15. In a machine of the class described, a tub, a bottom car, a top car, a vertical king-pin device connecting said cars and tub to turn on a common vertical axis, a pontoon located at each side of the machine and comprising an elongated body having a central block and tracks to the front and rear of said block, a truck having wheels mounted in said tracks at the front and rear of said block, hydraulic jacks carried by said bottom car and connected to said trucks by ball

and socket joints, a vertically slotted plate pivoted to each of said blocks on longitudinal axes and travel eccentrics mounted on said bottom car and having wrist pins lying in the vertical slots of said travel eccentrics for purposes described.

5 16. In a machine of the class described, a tub, a bottom car, a top car, a vertical king-pin device connecting said cars and tub to turn on a common vertical axis, a pontoon located at each side of
10 the machine and comprising an elongated body having a central block and tracks to the front and rear of said block, a truck having wheels mounted in said tracks at the front and rear
15 of said block, hydraulic jacks carried by said bottom car and connected to said trucks by ball and socket joints, a vertically slotted plate pivoted to each of said blocks on longitudinal axes, and travel eccentrics mounted on said bottom car and having wrist pins lying in the vertical slots of
20 said travel eccentrics for purposes described, said blocks having concaved top faces and said travel eccentrics having convex flanges to ride on said concaved top faces.

17. In a machine of the class described, a tub,
25 a bottom car, a top car, a vertical king-pin device connecting said cars and tub to turn on a common vertical axis, a pontoon located at each side of the machine and comprising an elongated body having a central block and tracks to the front
30 and rear of said block, a truck having wheels mounted in said tracks at the front and rear of said block, hydraulic jacks carried by said bottom car and connected to said trucks by ball and socket joints, a vertically slotted plate pivoted
35 to each of said blocks on longitudinal axes, travel eccentrics mounted on said bottom car and having wrist pins lying in the vertical slots of said travel eccentrics for purposes described, and means interconnecting all of said jacks hydraulically to
40 equalize the pressure therein, in virtue of which when the tub reaches the ground the machine will level itself regardless of ground irregularities.

18. In a machine of the character described, a
45 tub, a car over the tub, a dolly unit between tub and car, a king-pin connection between said tub and car, pontoons one on each side of the machine, said pontoons having tracks, trucks carried by said pontoons' tracks, hydraulic levelling
50 jacks connecting said trucks to said car, and operator controlled power mechanism for actuating said jacks and causing travel of said trucks and pontoons forwardly and backwardly in the direction in which the machine is to be transported.

55 19. In a machine of the character described, a tub, a car over the tub, a dolly unit between tub and car, a king-pin connection between said tub and car, pontoons one on each side of the machine, said pontoons having tracks, trucks carried by said pontoons' tracks, hydraulic jacks
60 connecting said trucks to said car and means cooperating with said jacks to lift said car and tub clear of the ground and cause said lifted car and tub to be conveyed along said pontoons while said car and tub are clear of the ground.

65 20. In a machine of the character described, a tub, a car, a dolly between said tub and car, a king-pin connecting said tub and said car to-

gether so that the one will turn on the other with the king-pin as an axis, a pontoon at each side of the machine, trucks longitudinally movable along the pontoon, a jack connecting each truck with said car, means to operate said jacks to
5 raise and lower said car and tub as a unit, and means when car and tub are raised, for moving them along on the pontoons.

21. In a machine of the class described, a tub,
10 a bottom car mounted on said tub freely to turn thereon on a vertical axis, a top car mounted on said bottom car for movement about said vertical axis, means to cause relative movement between the top and bottom cars about said vertical axis,
15 means to connect said cars and said tub together as a unit, and means cooperating with said bottom car for lifting said cars and said tub clear of the ground, and to carry said cars and tub as a unit over the ground, and means to hold the top car against turning when the tub is resting
20 on the ground in virtue of which the bottom car can be turned about its axis while the top car and tub remain stationary.

22. In a machine of the class described, a tub,
25 a bottom car mounted on said tub freely to turn thereon on a vertical axis, a top car mounted on said bottom car for movement about said vertical axis, means to cause relative movement between the top and bottom cars about said vertical axis,
30 means to connect said cars and said tub together as a unit, means cooperating with said bottom car for lifting said cars and said tub clear of the ground and to carry said cars and tub as a unit over the ground, said last named means comprising pontoons having blocks with tracks for-
35 wardly and rearwardly therefrom, trucks running on said tracks, adjustable means connecting said trucks with said bottom car, rotatable shafts carried by said bottom car, travel eccentrics on said shafts to roll on said blocks, vertically slotted
40 guide plates secured to said blocks, wrist pins on said eccentrics and lying in the slots of said guide plates, and means to turn said rotatable shafts

23. In a machine of the class described, a tub,
45 a bottom car mounted on said tub freely to turn thereon on a vertical axis, a top car mounted on said bottom car for movement about said vertical axis, means to cause relative movement between the top and bottom cars about said vertical axis, means to connect said cars and said tub
50 together as a unit, means cooperating with said bottom car for lifting said cars and said tub clear of the ground and to carry said cars and tub as a unit over the ground, said last named means comprising pontoons having blocks with tracks
55 forwardly and rearwardly therefrom, trucks running on said tracks, adjustable means connecting said trucks with said bottom car, rotatable shafts carried by said bottom car, travel eccentrics on said shafts to roll on said blocks, vertically slotted
60 guide plates secured to said blocks, wrist pins on said eccentrics and lying in the slots of said guide plates, means to turn said rotatable shafts, and means to control said adjustable means to aid said eccentrics in lifting said cars and tub clear of the
65 ground.

JOHN MORRIS POCHÉ.

CERTIFICATE OF CORRECTION.

Patent No. 2,132,184.

October 4, 1938.

JOHN MORRIS POCHE.

It is hereby certified that error appears in the above numbered patent requiring correction as follows: In the heading to the printed specification, name of second mentioned assignee, for "Christian Joseph Neunier" read Christian Joseph Meunier, as shown by the record of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 18th day of October, A. D. 1938.

Henry Van Arsdale

Acting Commissioner of Patents.

(Seal)