C. D. CAMPBELL.

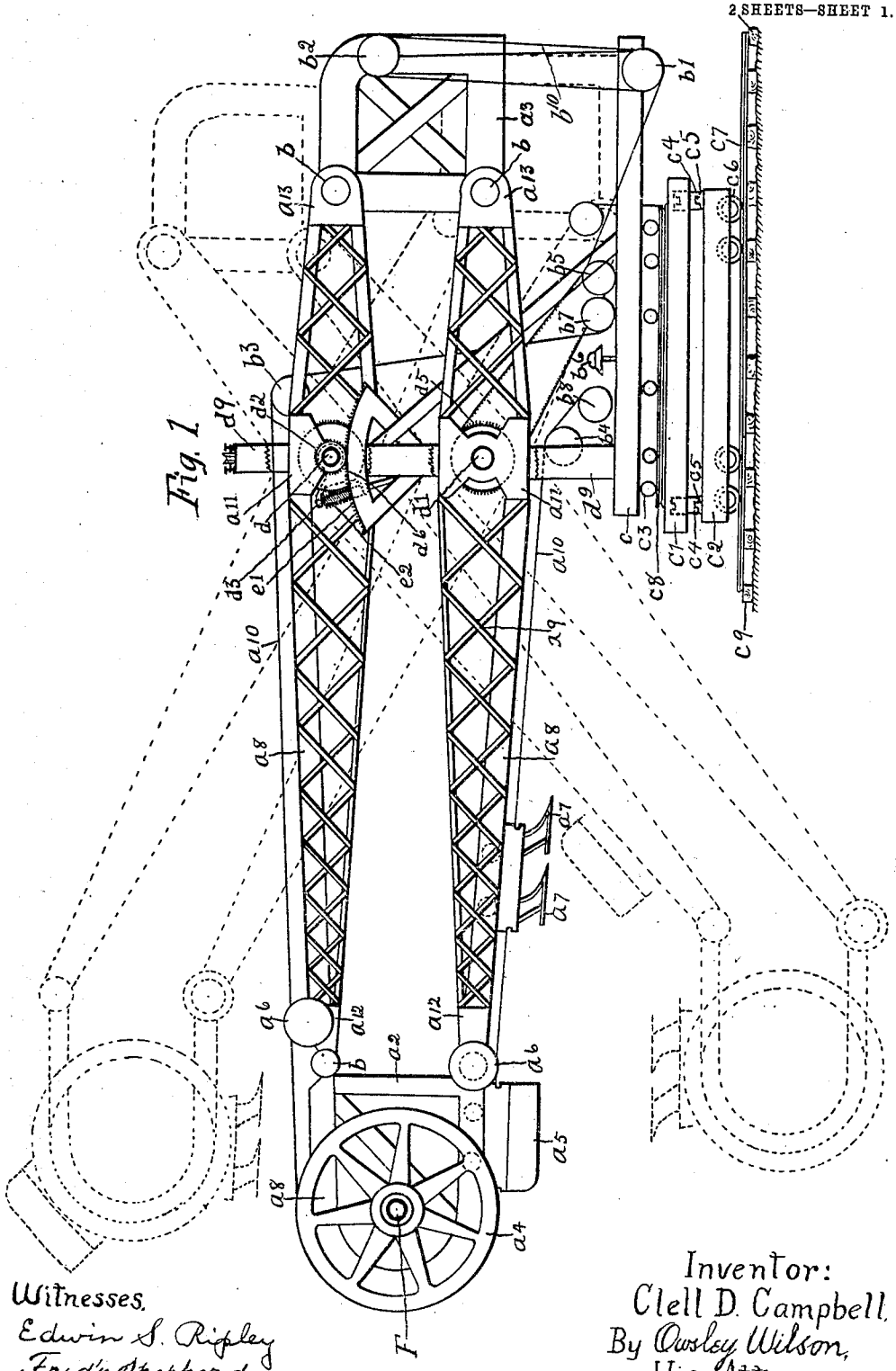
TWIN BOOM ADJUSTABLE EXCAVATOR AND DREDGE.

APPLICATION FILED MAR. 23, 1908.

926,096. Patented June 29, 1909.

2 SHEETS—SHEET 1.

Fig. 1



Witnesses.
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Clell D. Campbell.
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2 SHEETS—SHEET 2.

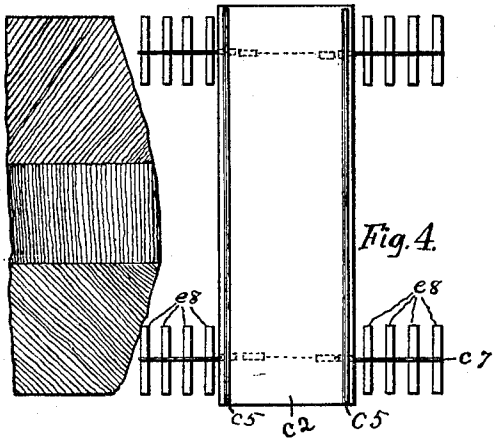


Fig. 4.

Fig. 3.

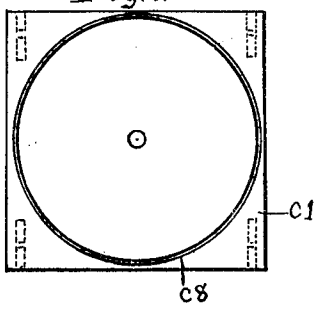


Fig. 5.

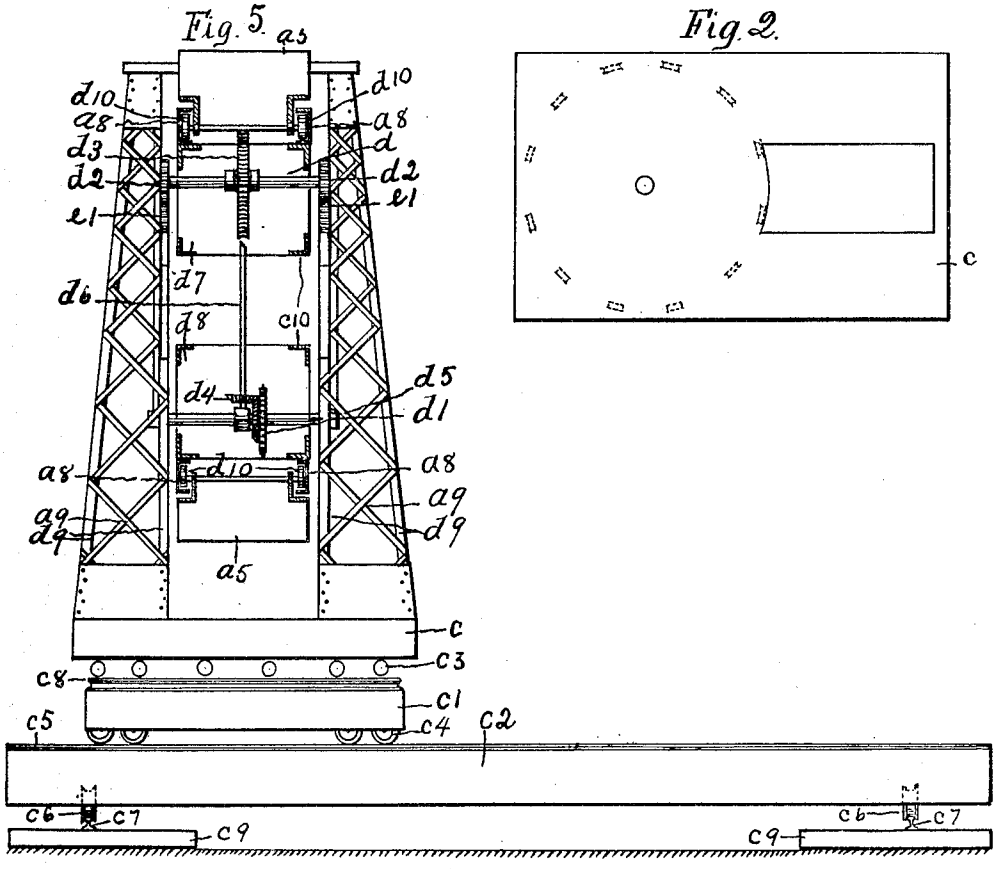


Fig. 2.

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UNITED STATES PATENT OFFICE.

CLELL D. CAMPBELL, OF LINCOLN, NEBRASKA.

TWIN-BOOM ADJUSTABLE EXCAVATOR AND DREDGE.

No. 926,096. Specification of Letters Patent. Patented June 29, 1909.

Application filed March 23, 1908. Serial No. 423,075.

To all whom it may concern:

Be it known that I, CLELL D. CAMPBELL, a citizen of the United States, residing at Lincoln, in the county of Lancaster and State of Nebraska, have invented an Improved Twin-Boom Adjustable Excavator and Dredge, of which the following is a specification sufficiently clear to enable those skilled in the art to which it appertains to make and use the same.

My invention relates to an improved twin boom adjustable excavator and dredge. Its object is:—1, the production of a machine which will excavate from above from the level of and from below the level of the machine in any direction and at any desired slope; 2, the production of a machine which will excavate in any direction at any desired grade, either from above or below and which will grade up, fill in, level off, or load cars in any direction from the machine; 3, the production of a machine which will dig trenches, or ditches with sides any slope, or build grades or dredge on any slope or on a level; 4, the production of a machine which from one track will cut away an embankment in front and level off for its own track and which may be reversed and will excavate below the level of its track in the rear, either in dry soil or below the water level. These purposes are attained in my invention by certain novel combinations of materials, parts and construction which will be hereinafter described and claimed.

My invention is illustrated in the accompanying drawings.

Figure 1, is a side view of my machine. Fig. 2 is a plan view of the upper platform or turntable car. Fig. 3 is a plan view of the center platform, or laterally moving car. Fig. 4 is a plan view of the lower car or track on ties showing sloping sides and bottom of grade excavation. Fig. 5 shows a cross section of my machine with towers on either side.

Similar letters refer to similar parts throughout the several views.

I make my machine with twin booms, one above the other, each boom of uniform width throughout and tapering in depth each way from axis, or bearing shaft. I make the corners of each boom of angle steel with the exception of the lower forward end of the bottom boom and the upper forward end of the top boom which corners I make of channel steel, "a^8 Fig. 1" so as to form parallel tracks and guides facing each other to hold and carry the scraper and plow wheels, "d^{10}, Fig. 5". I make the booms of metal lattice work, "a^9, Fig. 1", preferably, though they may be made with sheet metal if desired, I lattice outside the channel steel so as to leave the wheel tracks free. I strengthen each boom by metal plates on each side at its greatest depth, "a^{11}" and at its ends, "a^{12}" and "a^{13}, Fig. 1". I make the booms each rectangular in cross-section as shown at "d^7 and d^8, Fig. 5". I suspend each boom at approximately one third its length on a horizontal axis, or shaft, "d and d^1, Fig. 1", placing one boom directly above the other so as to rock vertically as shown by the dotted lines in Fig. 1, with bearings on its shaft or axle. I make the lower boom axle stationary boxing it into the pier or tower on either side, "d^9, Fig. 5". I make the upper boom axle so that it may be moved in the arc of a circle whose center of radiation is the lower boom shaft for which purpose I place a pinion wheel, "d^2, Fig. 1" on each end of the upper boom shaft on the curved cog track, "c' Figs. 1 and 5", which cog track is built into the pier, on each side of the boom, and braced to the pier and to the turntable "c", the piers being made with an offset to receive the cog track and its braces. I further equip the upper boom shaft with the worm wheel "d^3, Figs. 1 and 5", and the worm "c^2, Fig. 1" and the worm shaft "d^6", its bevel gear and sprocket wheel "d^4 and d^5 Fig. 5" and chain connected with sprocket and power. On the turn table "c" I build on each side of and supporting the booms a pier or tower, "d^9, Fig. 5" which piers I make with angle metal corners, and latticed or sheet metal sides, latticed preferred, and connect the piers together at the top with two eye-beams between which eye-beams I place a pulley for convenience in assembling the parts. To the longer, or working, ends of the twin booms I attach by the hinge joints, "b, Fig. 1" the grade regulating frame, or car, "a^2, Fig. 1" which I make with parallel channel metal (steel preferred) tracks above and below connected at the outer end by parallel half circles of channel shaped metal all rigidly

connected and braced together. At the axis of the half circles I place horizontally through said frame, or car, an axle, or shaft, "F" Fig. 1" on each end of which axle I place the cable carrying wheels "a^4, Fig. 1". To the shorter ends of the twin booms I likewise attach by hinge joints "b" the ballast carrying frame, or car, "a^3, Fig. 1" in which an engine may be carried if desired. I make the ballast carrying frame, or car, of any suitable material, metal preferred, building it well braced and rigid. To the upper and outer sides of the ballast carrying frame I attach the upper sheave wheels, "b^2, Fig. 1" of a block and tackle arrangement, the lower sheave wheels "b^1 Fig. 1" of which I attach to the sides of the extended end of the turn table platform, or car "c" as shown in Fig. 1, connecting the cable of the block and tackle arrangement to the power operated drum, "b^5, Fig. 1", from which cable "b^{10}" goes under the double sheave wheel "b^1" then up and over the sheave wheel "b^2" then down and under the double sheave wheel "b^1", then back up and its end attached to casing of sheave wheel "b^2". I make the scraper and plow moving cable, "a^{10}, Fig. 1" either of chain, or wire cable, wire cable preferred. I attach one end of the cable to the power operated drum, "b^8 Fig. 1" passing the cable up over the sheave wheel "b^4, Fig. 1" attach the cable to the plow, the cable passes over the cable carrying wheels "a^6" and is attached to the scraper "a^5" the cable then passes around the cable carrying wheels "a^4, Fig. 1" and over cable carrying wheel "a^6" above and back to and over cable sheave wheel "b^3" and down to the power operated drum "b^7," all shown in Fig. 1. I make my scraper, "a^5" and plow "a^7" Fig. 1, with rigid supports offset inwardly and carried by an axle above in front and in the rear of each scraper and plow, on wheels "d^{10} Fig. 5" which wheels run in the channel tracks, "a^8 Fig. 5". I make my plow interchangeable with a scraper for use in soft soils.

I mount my machine upon ordinary, power operated cars of steel construction preferred, placing my machine, together with the drums and engine, or other power, upon the upper car "c Fig. 1" though the engine may be mounted upon the ballast carrying frame or car if desired, the car "c" revolving in a complete circle on track c^8 on the second car "c^1 Fig. 1" and the second car "c^1, Fig. 1" moving laterally back and forth across the excavation on tracks c^5 on the lower car, "c^2, Fig. 1". The lower car "c^2, Fig. 1" moving forward and back on the tracks "c^7, Fig. 4."

In use I place my machine in the position shown in "Fig. 1" and operate the same by any suitable power in the following manner: I move the scraper and plow around the grade regulating frame or car to positions above the grade regulating car and upper boom by means of the scraper and plow cable "a^{10}" and power operated drum "b^7", then lower the longer ends of the twin booms until the grade regulating frame, or car, reaches the point at which the excavation is desired by means of the block and tackle arrangement, "b^1 and b^2" and the cable used thereon, "b^{10}" and the drum, "b^5". I then by means of the drum "b^8" and the plow and scraper cable "a^{10}" move the plow and scraper around and under the grade regulating frame and lower boom plowing the soil and filling the scraper, then elevate the grade regulating frame and the long ends of the twin booms to the height desired by the drum "b^5" and the block and tackle arrangement. I then revolve the turntable car "c" moving the car "c^1" laterally on track c^5, until the grade regulating car is directly over the place where the dirt is to be deposited, then by means of the drum "b^7" and cable "a^{10}" move the loaded scraper out around the end of the grade regulating frame until the scraper assumes a vertical position and the dirt is deposited and the scraper and plow again assume a position above the grade regulating frame and the upper boom. This process is repeated the position of the turn table car "c" being moved laterally on car "c^1" as the excavating progresses and circumstances require and car "c^2" being moved forward and backward as most convenient during progress of the work. My machine so used enables the bottom of the excavation to be made on a level, the grade regulating frame having its lower side horizontal at any elevation or depression it may assume owing to the novel construction of my machine.

When I desire to make the excavation on a slope, as for the sides of a cut I move the axle of the upper twin boom by the mechanism provided therefor until the lower side of the grade regulating frame assumes the incline, or decline desired and proceed as before with the excavating, the novel construction of my machine then holding the grade regulating frame at the same angle at all elevations and depressions. Moving the axle of the upper boom forward causes the grade regulating frame to decline and slope forward, moving the axle backward causes the grade regulating frame to incline and slope upward.

The mode of operating my machine is exceedingly simple and its utility is at once apparent. Besides doing all kinds of excavating it will build a grade or dike, cut down a bank in front and make a fill in the rear, excavate at the sides and make a fill in front, build its own grade and it may be used as a derrick to pick up sections of its own track from the rear and swing them

into position in front, having leveled off its grade by passing the scraper back and forth over same. It may be also used to handle and operate a pile driver and for many other useful purposes.

I am aware that a turntable car mounted to rotate on a second car, a second car mounted to move transversely on a third car, a third car mounted on tracks are not new and I do not broadly claim same.

What I claim as my invention and desire to secure by Letters Patent is:—

1. In an excavating machine, or similar structure, in combination, a pair of twin booms, said booms being pivoted one above the other at approximately one third their length so as to have a vertical rocking motion and a ballast car, pivotally attached to each of said booms.

2. In an excavating machine, or similar structure, the combination of a regulating frame or car and a pair of twin booms pivotally connected with each other and excavating appliances mounted on the regulating frame and booms.

3. In an excavating machine or similar structure, in combination a pair of independent, parallel, moving twin booms, a ballast car pivotally attached to said twin booms, a grade regulating frame pivotally attached to said twin booms and power mechanism for operating said booms by raising and lowering said ballast car.

4. In a machine of the type described, in combination, a pair of independent, parallel, moving twin booms, a ballast car which is pivotally attached to each of said twin booms, a grade regulating frame which is pivotally attached to each of said booms and excavating appliances mounted upon said grade regulating frame and booms.

5. In a machine of the type described, a pair of independent, parallel, moving twin booms, a ballast car, which is pivotally mounted to each of said twin booms, a grade regulating frame, which is pivotally attached to each of said booms, and mechanism for operating said booms by raising and lowering said ballast car, in combination with excavating appliances mounted on said grade regulating frame and booms.

6. In an excavating machine, or similar structure, the combination of a grade regulating frame or car, a pair of twin booms, each of said booms being pivotally connected with said regulating frame, excavating appliances mounted on said regulating frame and booms and mechanism for longitudinally adjusting one of said booms independently.

7. In an excavating machine, or similar structure, in combination, a pair of independent, parallel, moving twin booms, which are pivotally attached to each other, a grade regulating frame which is pivotally attached to each of said booms, mechanism for shifting one of said booms to change the slope of said grade regulating frame, and excavating appliances which are mounted on said frame and booms.

8. In a machine of the type described, a pair of independent, parallel, moving twin booms which are pivotally attached to each other, a grade regulating frame which is pivotally attached to each of said booms, mechanism for shifting one of said booms to longitudinally tilt said regulating frame and excavating appliances which are mounted on said frame and booms, in combination with mechanism for operating said excavating appliances.

9. In a machine of the type described, in combination, a pair of parallel twin booms, said booms being pivoted one above the other, a grade regulating frame, said frame being pivotally attached to each of said booms, mechanism for shifting one of said booms, a ballast car, said car being pivotally attached to each of said booms, and excavating appliances mounted on said grade regulating frame and booms.

In testimony whereof I have signed my name to this specification at Lincoln, Nebraska in the presence of two subscribing witnesses.

CLELL D. CAMPBELL.

Witnesses:

T. F. A. WILLIAMS,

FREDERICK SHEPHERD.