

(No Model.)

2 Sheets—Sheet 1.

J. B. WEBBER.
STEAM SHOVEL OR EXCAVATOR.

No. 528,312.

Patented Oct. 30, 1894.

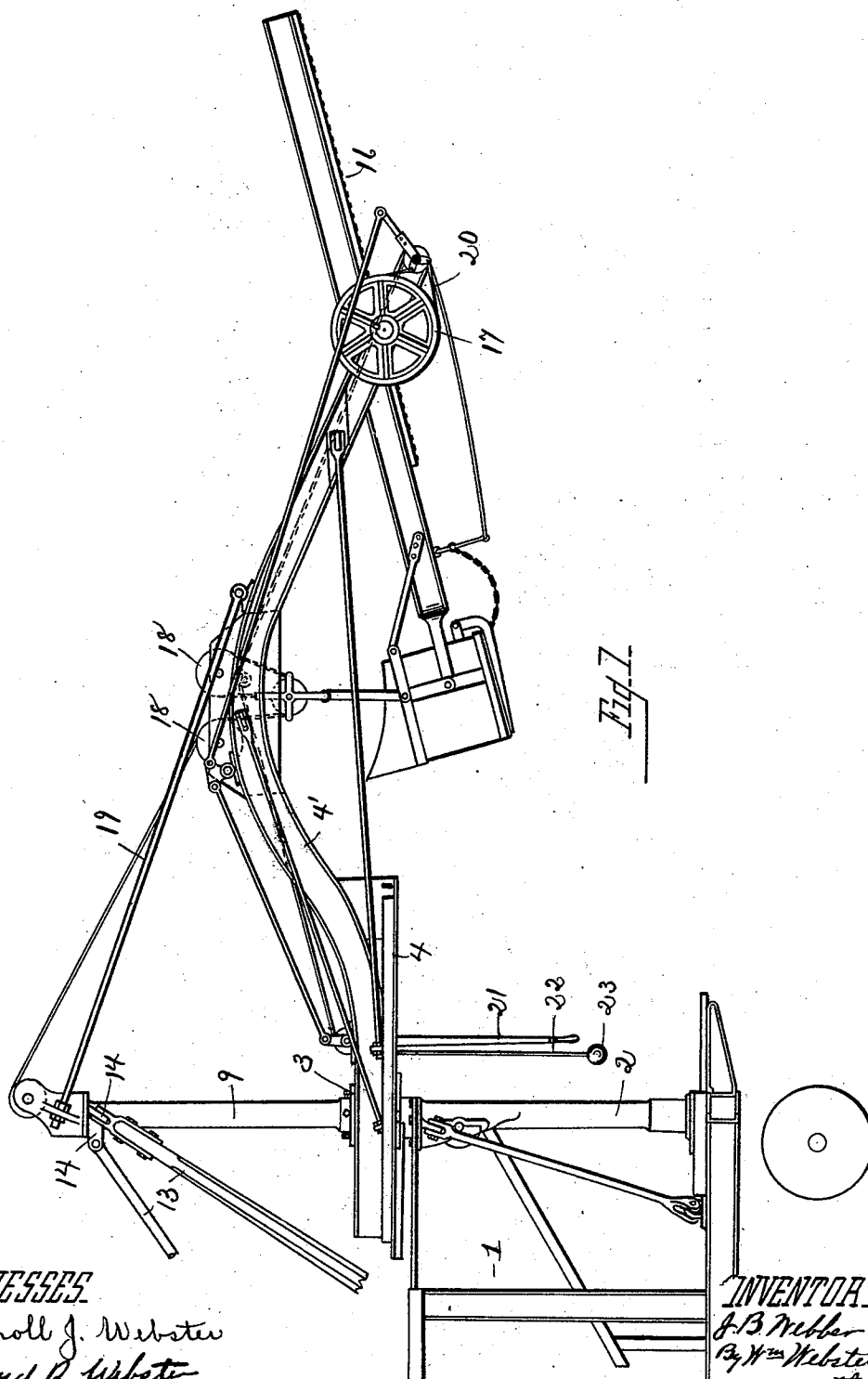


Fig. 1

WITNESSES

Carroll J. Webster
Floyd R. Webster

INVENTOR

J. B. Webber
By H. M. Webster
att'y

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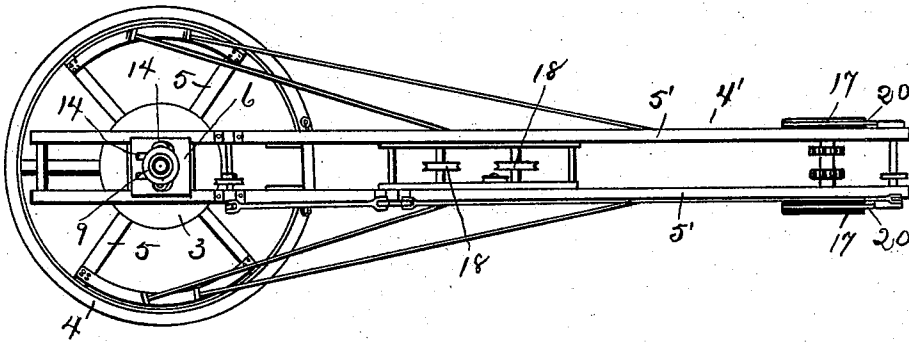


Fig. 2.

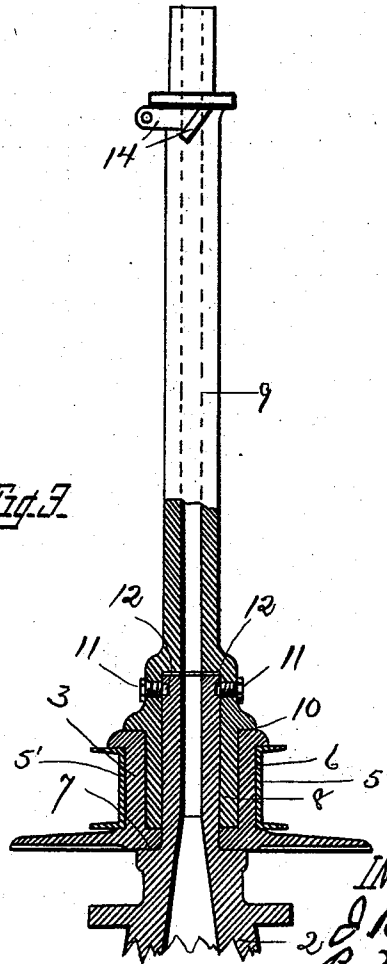


Fig. 3.

WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN BAPTIST WEBBER, OF TOLEDO, OHIO, ASSIGNOR TO THE VULCAN
IRON WORKS COMPANY, OF SAME PLACE.

STEAM SHOVEL OR EXCAVATOR.

SPECIFICATION forming part of Letters Patent No. 528,312, dated October 30, 1894.

Application filed October 7, 1893. Serial No. 487,425. (No model.)

To all whom it may concern:

Be it known that I, JOHN BAPTIST WEBBER, of Toledo, county of Lucas, and State of Ohio, have invented certain new and useful Improvements in Steam Shovels or Excavators; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form part of this specification.

My invention relates to steam shovels or excavators, and has especial relation to the manipulation and operation of the dipper.

The object of the invention is to provide a crane and dipper operating mechanism whereby the dipper may be worked toward the excavator in filling, and upward toward the center of the crane for discharging.

A further object is to provide a supplemental mast above the swinging circle by which to firmly support the crane through the medium of braces connected directly with the excavator frame.

The invention consists in the parts and combination of parts hereinafter described and pointed out in the claims.

In the drawings: Figure 1 is a side elevation of a portion of the excavator frame with the crane and dipper mechanism in operative connection therewith. Fig. 2 is a top plan view of the crane and circle, and Fig. 3 is an elevation partly in section of the supplemental mast mounted upon the crane mast.

Heretofore in apparatus of this character, the dipper handle and scoop actuating mechanism has been arranged in a manner to actuate the scoop from the excavator in the act of filling, or in other words, the excavating has been carried on from the excavator forward, the dipper being lowered toward the excavator for filling, and raised from the excavator in filling. While this operation is preferable in some classes of work, it is impracticable in others, notably in excavating for railway beds, where it is desired to discharge the loaded scoop or dipper into cars for transporting the earth to a dump or place of deposit, as the area of the circle described

by the swing of the crane and extended scoop of dipper precludes the possibility of dumping into cars in parallel relation with the excavator unless the track upon which the cars are run is at an inconvenient distance from the work at one side of the same.

In excavating from the water's edge with the present form of apparatus, it requires that the excavator be placed within the water, and the load discharged into lighters at the side or receptacles upon the land. These are two of many other conditions that could be enumerated by which it will be at once apparent to those versed in the art in which the present construction of steam shovel or excavator is essentially impracticable.

In the present invention I have endeavored to provide a shovel or excavator especially adaptable to this class of work, and have not only succeeded in overcoming the various difficulties noted, and that have heretofore existed, but have relieved the parts of a great amount of strain by reversing the operation of the dipper, and bringing the load nearer the excavator when sustained and carried thereby, to a place of deposit.

I have provided an apparatus whereby the excavator may sit in parallel relation with, and immediately at the side of the track upon which the cars to be loaded are placed, the work of excavation and discharge into the cars being carried on with the greatest facility, as the arc traversed by the loaded bucket or dipper swings the same directly over the car, and the line of excavation is immediately in front of the car and excavator, thereby permitting the car to run directly to the edge of the excavation. The same is true in excavating from the water's edge. The excavator can be placed upon the extreme edge of the bank, and the scoop or dipper in operation is lowered from the excavator, and works toward the same in filling. The advantages of this operation will be at once apparent, as the excavator may be retracted as the work progresses, and the shovel be caused to work in the channel progressively as the work is being accomplished. In working toward the excavator, and thereby decreasing the area of the arc of the circle traversed by the load, I have relieved the crane and consequently

the excavator frame of practically one half of the strain incident to sustaining the load at the extreme end of the crane, and have devised novel means for assisting in sustaining the weight of the crane independently of the axial post or circle.

1 designates what I shall hereinafter term the excavator, by which will be understood the entire frame work, independent of the swinging crane and its connections therewith, and dipper mechanism; 2, the mast; 3, the star trunnion, and 4 the circle connected with the star trunnion by means of radial arms 5 in the usual or any preferred construction. Mounted upon the star trunnion 3 is the crane 4, comprising two channel bars 5' extending in parallel relation, and secured one upon each side of the trunnion upon a square portion 6 thereof, so that the crane will swing with the revolution of the circle. Mast 2 is reduced at the upper end, whereby a shoulder or bearing 7 is formed upon which the trunnion rests, and the squared portion 6 is bored out to a diameter to allow an annular space around the end of post 2 into which seats an annular end 8 of a supplemental mast 9, which closely fits the end of post 2, thereby forming a bearing for the end of mast 2. The end 8 of mast 9 is formed with an annular bearing 10 which seats upon the upper surface of the star trunnion, and the extreme end of the angular portion rests upon the inner concentric portion of the trunnion at the termination of the bore, whereby the trunnion is supported vertically upon the mast 2, and revolves upon the same and a bearing formed by the supplemental mast. The supplemental mast is held in position from vertical displacement by means of the projecting ends of a plurality of screws or bolts 11 tapped through the same, and entering the annular groove 12 formed in the end of the mast 2.

Mast 9 extends above the circle some distance, and is supported by means of a plurality of braces 13 secured to the ears 14 formed thereon, and connected with the frame work at rigid points. Channel bars 5 forming the crane are curved upwardly from the circle, reaching the highest curvature at the desired point of the greatest elevation of the dipper or scoop, and from this point incline downwardly to the end, where the usual shipper shaft is journaled, having a gear meshing with the rack 16 upon the dipper handle, and the brake wheel 17 and the sheaves 18 for the hoisting rope or chain are journaled between the bars at the point of highest curvature. Crane 4 is sustained in addition to its connection with the trunnion by means of rods 19 connected at one end to a casting 24 revolvably secured upon the reduced upper end 24' of the supplemental mast 9, and to the channel irons, thereby greatly relieving the mast 2 and trunnion from strain when the load is being elevated. The brake 20 upon the shipper shaft wheel is actuated by means of a lever 21, and the trip of the dipper

or scoop is thrown by means of a rope 22 having weight 23 to take up the slack during the movement of the dipper.

In operation, the excavator is firmly anchored, and as the dipper is lowered, it swings from the excavator in the act of lowering, and is pulled toward the same in the act of filling, and until finally raised into the raised portion of the crane when the crane may be swung in either direction, casting 24 revolving on the mast, due to the pull given by the crane, and the load discharged. It will be seen that great time is gained and strain relieved by reason of the close proximity of the load at the time the dipper or shovel is being swung to a point to discharge over those constructions where the arc of the circle described is greater and the load sustained upon the extreme end of the crane. It will be also seen that by reason of the highest point of the boom being substantially central of its length at a point at which the hoisting sheaves are located, the dipper will swing upward to a point above either a car into which the contents are to be discharged, or an accumulation of dirt, and that by providing a supplemental mast to mast 2, it is only necessary to remove the section 9 in transportation or in moving from place to place.

While I have shown and described specifically a preferred form of securing the two masts in vertical adjustment, I may vary this form greatly without departing from the spirit of my invention.

What I claim is—

1. In a steam shovel or excavator, a swinging crane having its highest point substantially central of its length, a shovel or dipper handle movably secured at the outer end, and means for drawing the dipper toward the excavator in filling, and into the raised portion of the crane for discharge.

2. In a steam shovel or excavator, a swinging crane comprising channel bars secured to the trunnion and having an upwardly central curved portion, sheaves journaled in the curved portion, a shovel or dipper handle movably secured at the outer end, and a hoisting rope or cable secured to the shovel or dipper and passed over the sheaves, whereby the shovel or dipper may swing from the excavator in lowering, and be drawn toward the excavator in filling, and into the curved portion in swinging.

3. In a steam shovel or excavator, the mast, the swinging circle secured therein, a crane secured to the circle trunnion, a supplemental removable mast supported centrally of the circle having braces secured to the supplemental mast and crane.

4. In a steam shovel or excavator, the excavator frame, a sectional mast supported thereon, a crane journaled upon the mast intermediate its length, braces extending from the excavator frame to the top of the mast, and braces from a casting revolvably secured upon the top of the mast to the crane.

5. In a steam shovel, a mast formed with a conical upper end and a shouldered bearing, a circle wheel trunnion upon the shoulder having an annular bearing, and a supplemental mast formed with a shouldered annular bearing to fit the end of the mast, whereby the two bearings may telescope and rest upon the shoulders.

6. In a steam shovel or excavator, the excavator frame, a sectional hollow mast secured thereon, a crane journaled upon the mast intermediate its length, a casting carrying a sheave revolubly secured upon the top of the

mast, a dipper handle carried by the crane, and a hoisting rope or cable connected with the dipper passing over the sheave and through the mast to the hoisting mechanism, and means for holding the mast in position. 15

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses. 20

JOHN BAPTIST WEBBER.

Witnesses:

WILLIAM WEBSTER,
CARROLL J. WEBSTER.