

(No Model.)

3 Sheets—Sheet 1.

J. C. BRINDLE.
STEAM SHOVEL AND DREDGE.

No. 545,939.

Patented Sept. 10, 1895.

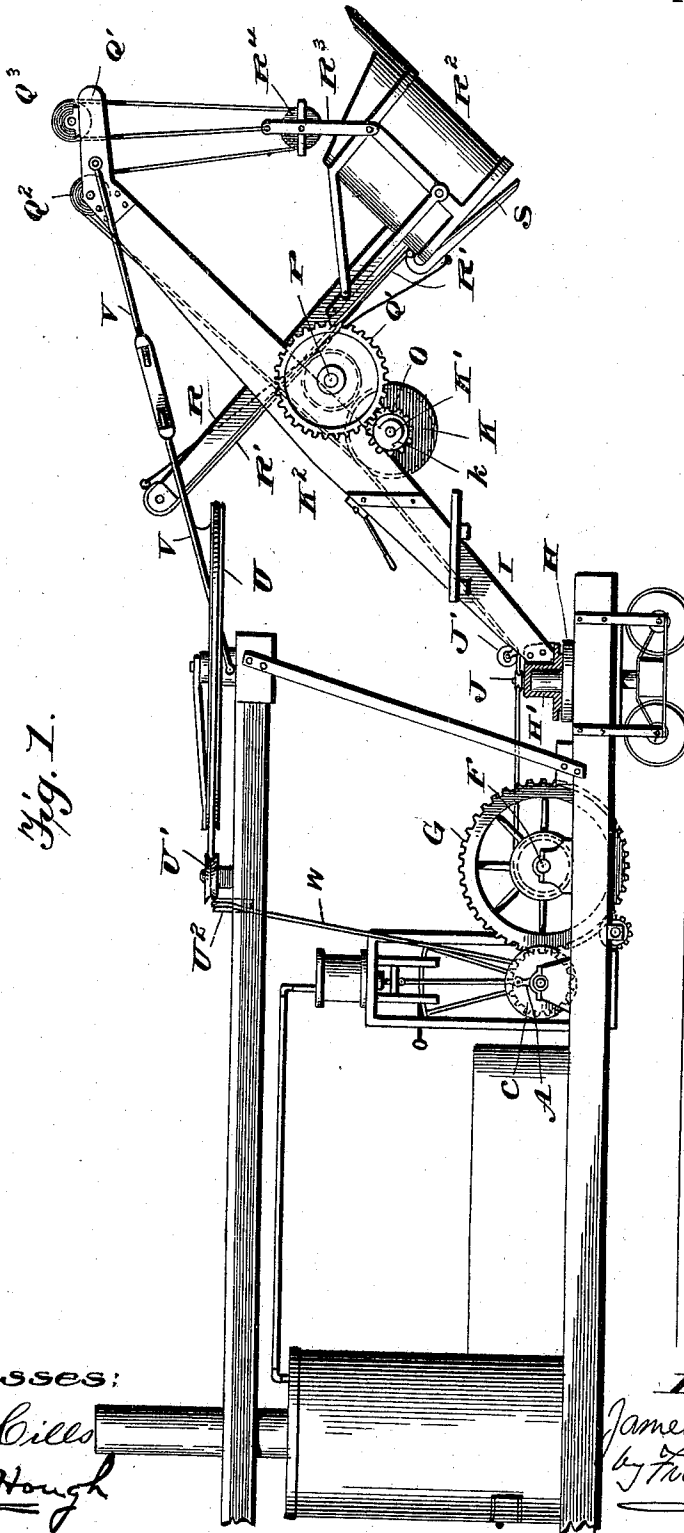


Fig. 1.

Witnesses:

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A. L. Hough

Inventor:

James C. Brindle,
by Franklin H. Hough

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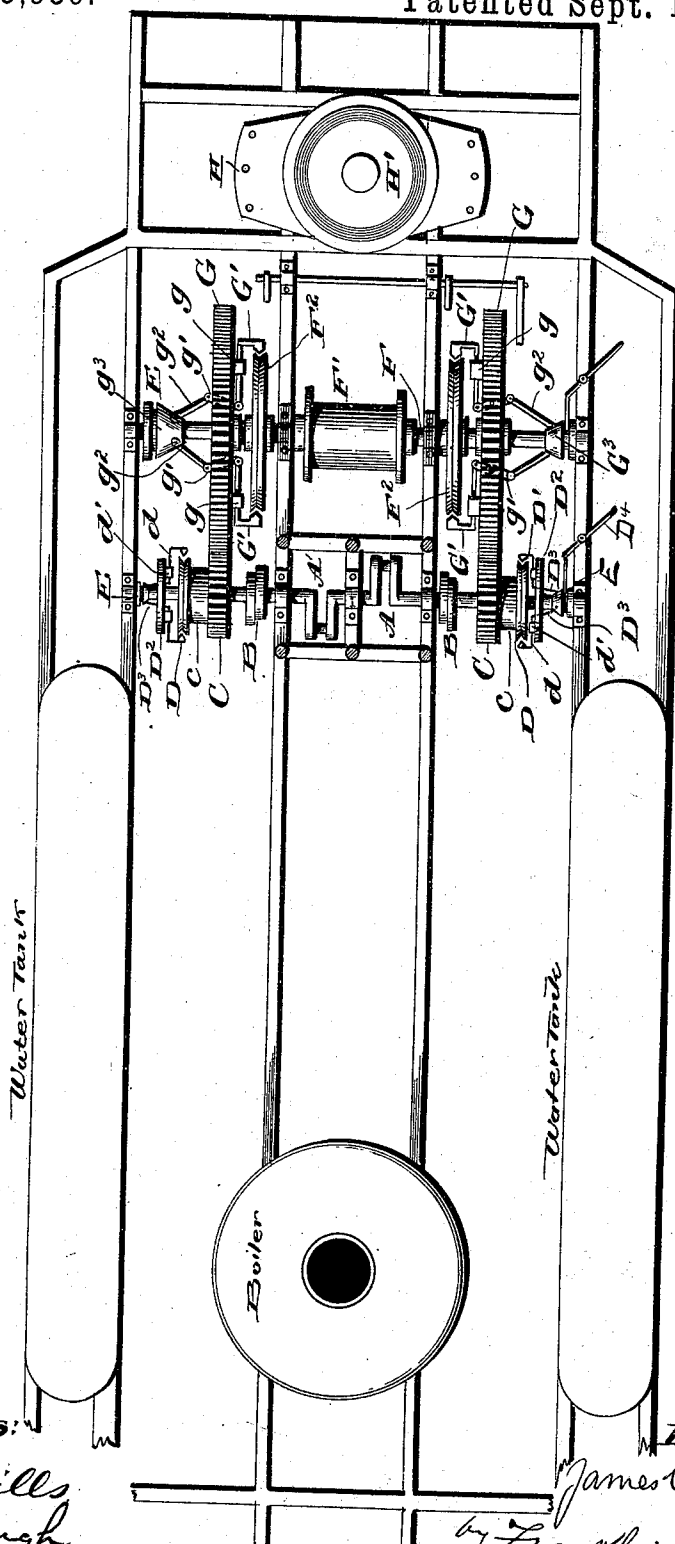
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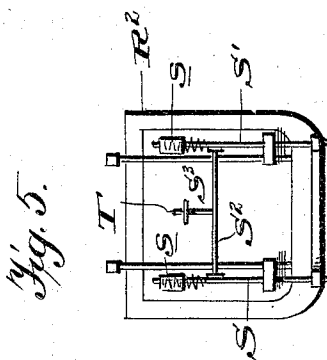
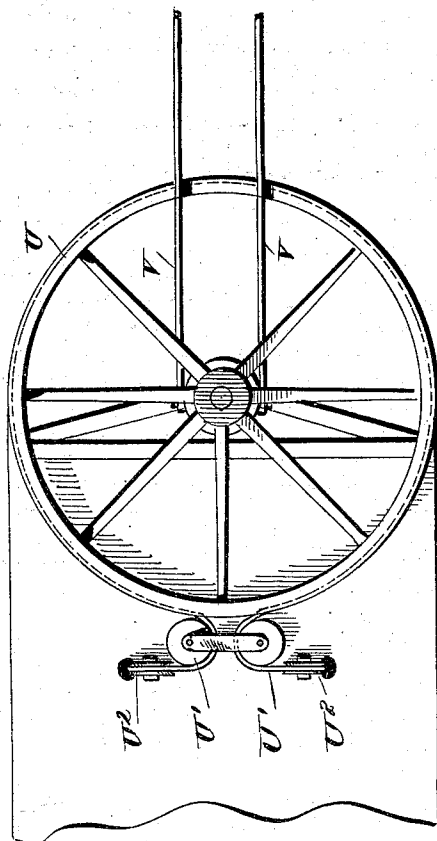
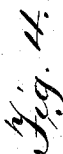
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3 Sheets—Sheet 3.

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UNITED STATES PATENT OFFICE.

JAMES C. BRINDLE, OF ASHLAND, OHIO, ASSIGNOR OF ONE-HALF TO PERRY WESTMAN, JAMES MYERS, AND GEORGE A. NICOL, OF SAME PLACE.

STEAM SHOVEL AND DREDGE.

SPECIFICATION forming part of Letters Patent No. 545,939, dated September 10, 1895.

Application filed June 15, 1895. Serial No. 552,951. (No model.)

To all whom it may concern:

Be it known that I, JAMES C. BRINDLE, a citizen of the United States, residing at Ashland, in the county of Ashland and State of Ohio, have invented certain new and useful Improvements in Steam Shovels and Dredges; and I do declare the following to be a full, clear, and exact description of the invention, such as 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 the letters of reference marked thereon, which form a part of this specification.

This invention relates to certain new and useful improvements in steam shovels and dredges, and especially to the class of dipper-excavators carried on a swinging crane, and in which I dispense with the endless chain commonly used, and in place of a chain use a cable, which communicates power from the main driving-wheel to pulleys carried on the crane, which actuate the movement of the dipper, suitable frictional gripping mechanism being used for throwing in and out of gear both the main driving-wheel and the drums about which the dipper-operating ropes or cables work.

A further object of the invention resides in the construction of mechanism for swinging the crane, consisting of a horizontally-journaled wheel mounted on the roof or top framework of the dredge, and around which wheel that has a circumferential groove pass the cables which turn on a winding-drum keyed to the main driving-shaft.

To these ends and to such others as the invention may pertain the same consists, further, in the novel construction, combination, and adaptation of the parts, as will be hereinafter more fully described, and then specifically defined in the appended claims.

I clearly illustrate my invention in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification.

Similar letters of reference indicate like parts throughout the several views, in which—

Figure 1 is a side elevation of my improved dredge. Fig. 2 is a plan view of the driving-shaft, winding-drum, and frictional gripping

mechanism, the boiler, water-tanks, and the motive power not being shown. Fig. 3 is a top plan view of the swinging crane carrying the dipper-operating mechanism; Fig. 4, a top plan view of the wheels for operating the swinging of the crane. Fig. 5 is an end view of the bucket, showing the way of drawing the latch for dumping.

Reference now being had to the details of the drawings by letter, A A designate the crank-shafts receiving power from the engine-driving pistons. B, B are eccentric-cams mounted on the said shaft; C, the main pinions fast upon the shafts; c, drums loosely journaled to said shafts, which drums are used for swinging the crane, hereinafter to be described in detail.

D is a friction-wheel having a V-shaped circumferential groove D' and is fast to drum c, and friction-shoes are mounted on the arms d, which latter work through the boxes d' on the wheel D², keyed to the driving-shaft, and have connection through the medium of the levers D³, held to the inclined members E, which latter have an annular recess for the reception of a shifting-lever D⁴.

F is a shaft mounted in suitable boxes, and has keyed thereto a winding-drum F', the frictional wheel F'' also keyed to said shaft F, and G is a main driving-wheel loosely journaled on the said shaft, having teeth about its circumference which are adapted to mesh with the teeth of the pinion C, and the said wheel G carries friction-shoes G', mounted in boxes g and having lever and link connection g' and g² with the inclined member G³, having an annular recess for the reception of a shifting-lever.

I have described but one side of the mechanism for driving the dredge; but it is my purpose to have two sets of driving mechanism, one on either side of the dredge, there being two crank-shafts, one connected with each engine, each operated by an engine, the two engines being side by side and designed to work together.

H represents a casting known familiarly in the art as a "coffin-plate," and H' is a metallic cap mounted on said casting, and on which the base of the crane I is pivoted.

J J are pulleys mounted on the casting H,

about which pulley the main hoisting rope or cable is designed to run coming from the winding-drum. J' is a pulley mounted at right angles to said pulley J, designed for
 5 guiding the hoisting-cable which runs from the main winding-drum F' over a pulley K, mounted on a shaft journaled in boxes $\frac{1}{2}$ on the crane-arms K². The said pulley K is loosely journaled and carries friction-shoes
 10 L in boxes L', connected by levers to an inclined recessed wheel L², which has a shifting-lever l for throwing the said friction-shoes into and out of frictional contact with the grooved wheel M, keyed to the shaft K'. N
 15 is a check-belt lever, and O is a pinion keyed to an end of the said shaft K'.

O' is a geared wheel meshing with the pinion O and keyed to the end of a shaft P, mounted in suitable boxes on the crane-arms.
 20 The said shaft P has keyed to it a winding-drum Q. The outer free end of the crane is provided with a casting Q', upon which the pulleys Q² and Q³ are mounted.

R is the dipper-shaft, and R' are ropes connected at their upper ends to the upper free end of the said dipper handle or shaft, thence
 25 pass about the winding-drum Q, thence passed down the dipper-handle and fastened to the under side of said handle near the dipper.

R² is the dipper, to the forward free end of which is pivoted the bail R³, carrying a pulley R⁴, about which the said rope or cable is
 30 passed after being passed over the pulley Q², after which it is continued and run over the pulley Q³ and its end secured to a loop in the said bail R³. The swinging bottom S of the dipper is pivoted to the dipper-handle and has two latches S' slidably held to the said
 35 bottom and spring-actuated, the springs being located in boxes s; and S² is a cross-bar connecting the two latches, and has secured near its middle a bar S³, which is connected by a rod T running up to the free end of the
 40 dipper-handle, where it may be connected by any suitable rope by which the latches may
 45 be released by the operator or cranesman.

Horizontally journaled on the roof of the dredge or framework is a circumferentially-grooved wheel U, and U' are two small wheels
 50 also grooved and mounted in the rear of said wheel U.

U'' are two grooved wheels mounted at right angles to the wheels U and U'. The said wheel U is mounted so as to cause the

turnbuckles or rods V to swing laterally as 55 the wheel is partially revolved.

W is a rope passing from around the drum c, thence up over the pulleys U' and around the pulley U.

It will be observed from the foregoing description that I dispense with the endless 60 chain commonly used and run the swinging mechanism of the crane and the dipper by frictional wheels which may be easily and quickly controlled, and that I provide two 65 sets of operating mechanism throughout the machine, by which both the dipper and main driving machinery may be driven by two engines side by side and working together. The crane is swung laterally by connection 70 with the drums c, each carried on separate shafts.

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

1. In combination in a dredge a winding drum and a friction wheel keyed to a shaft 75 mounted in suitable boxes on the dredge frame, a driving wheel loosely journaled on said shaft, friction shoes mounted on said driving wheel, a sliding beveled wheel on said shaft and lever connection with said brake shoes, means for operating same, and the main crank shaft carrying a pinion designed to mesh with the peripheral teeth of said 85 driving wheel, substantially as shown and described.

2. In combination with the driving mechanism as described, a swinging crane, the shaft K' journaled on said crane, pulley K 90 loosely turning thereon, the friction wheel M keyed to said shaft, the friction shoes carried by said pulley K and having connection with a beveled sliding member L², means for operating the same, the shaft P having keyed thereto the drum Q, pinion wheels Q and O 95 meshing with each other, the cables R', secured to a dipper handle and winding about said drums Q, and the main driving cable connecting the driving drum with the dipper, 100 all substantially as shown and described.

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

JAMES C. BRINDLE.

Witnesses:

BYRON STILWELL,
 GEO. M. HOWLAND.