

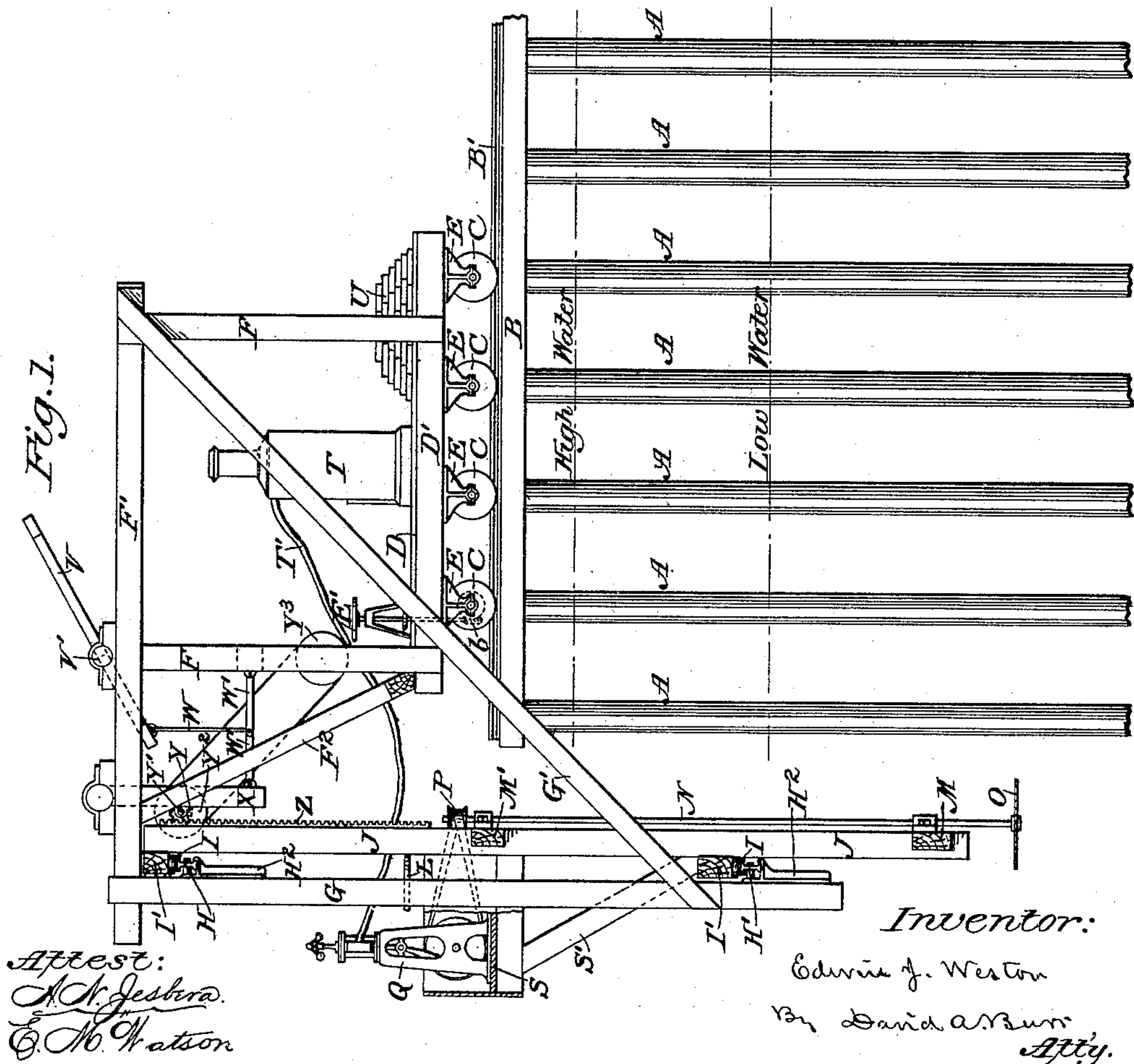
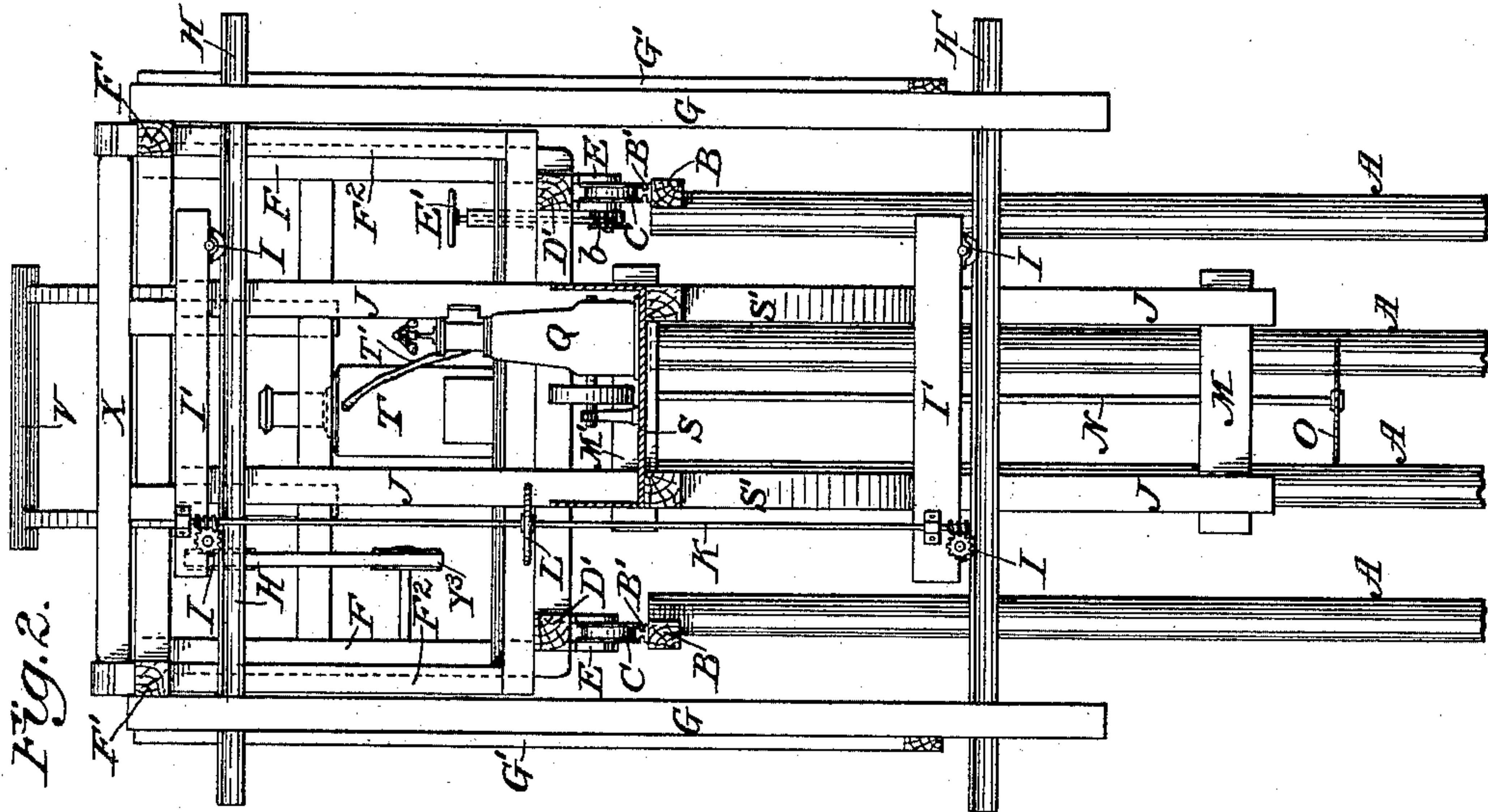
(No Model.)

2 Sheets—Sheet 1.

E. J. WESTON.
MACHINE FOR CUTTING OFF PILES.

No. 409,342.

Patented Aug. 20, 1889.



Attest:
A. V. Jespersen.
G. M. Watson.

Inventor:
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By David A. Burr
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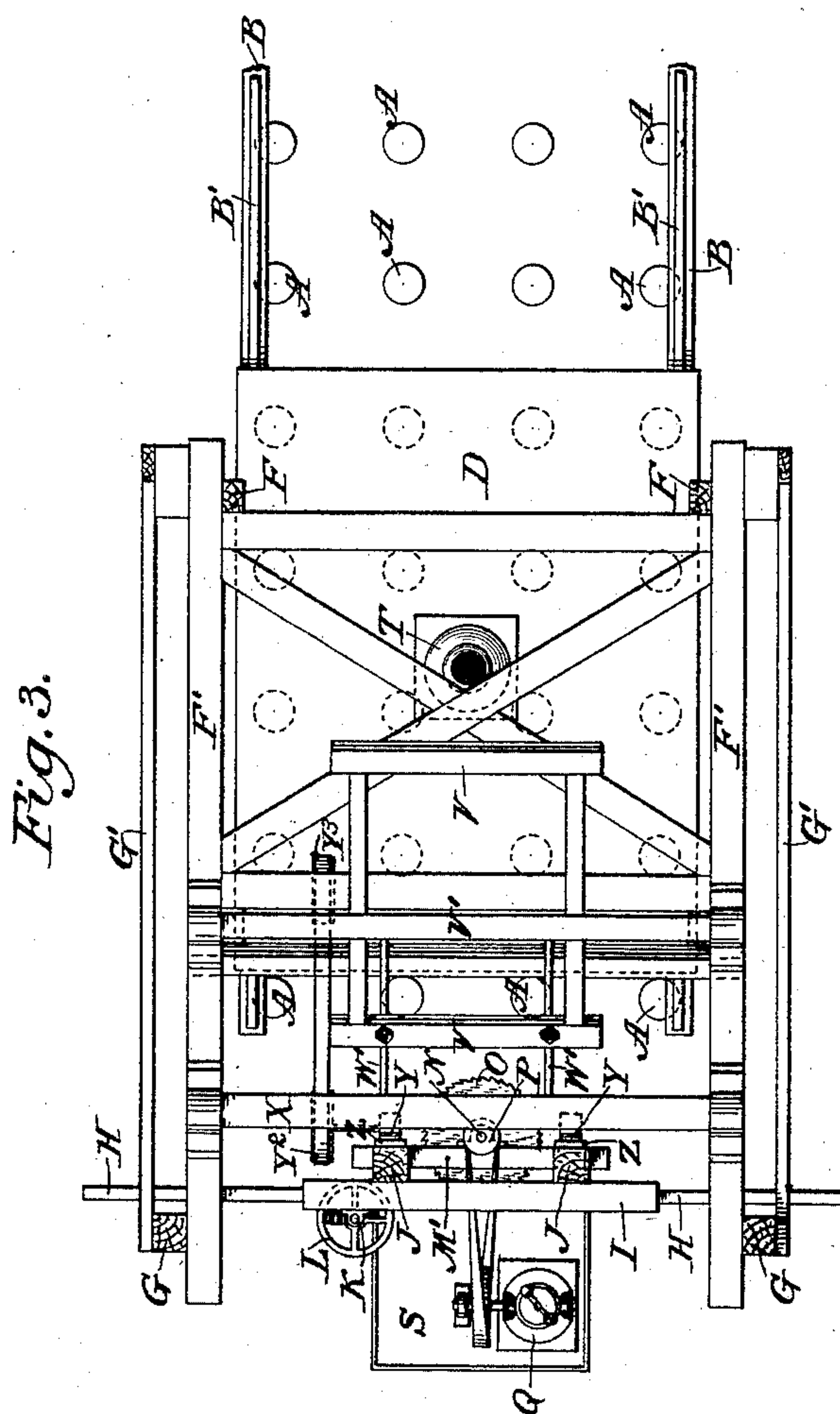
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2 Sheets—Sheet 2.

E. J. WESTON.
MACHINE FOR CUTTING OFF PILES.

No. 409,342.

Patented Aug. 20, 1889.



Attest:
A. H. Jackson
C. M. Watson

Inventor:
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UNITED STATES PATENT OFFICE.

EDWIN J. WESTON, OF SAN FRANCISCO, CALIFORNIA.

MACHINE FOR CUTTING OFF PILES.

SPECIFICATION forming part of Letters Patent No. 409,342, dated August 20, 1889.

Application filed May 1, 1889. Serial No. 309,211. (No model.)

To all whom it may concern:

Be it known that I, EDWIN J. WESTON, of San Francisco, in the county of San Francisco and State of California, have invented certain
5 new and useful Improvements in Machines for Sawing Piles; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of
10 reference marked thereon, making a part of this specification.

This invention relates to machines for cutting off the heads of piles under water; and it consists in the novel details of construction
15 and combination of parts involved in the machine, as hereinafter described and claimed.

In the work for which the machine is specially designed the tops of piles driven in deep water require to be cut off some eighteen
20 feet below the high-water mark in manner to be all alike perfectly level and true, so that the floor of a caisson sunk to rest thereon shall have an equal and even bearing on each pile. To facilitate the work the two outer
25 rows of piles are driven at a distance apart equal to the width of the bed-frame of the pile-cutter—say fourteen feet—and the upper ends of these piles are cut off level, about one foot, more or less, above high-water mark, and
30 a suitable piece of timber is checked in the outer side of each row at the top and made fast by spikes or bolts to serve as a stringer. Upon each stringer a metallic or wooden rail is laid, and a track is thus constructed extending the entire length of the row of piles upon which the pile-cutting machine may travel. The track is laid in short lengths to permit it to be taken up section by section as the machine moves back after the piles immediately in front of it have been cut off by
40 its operation.

In the accompanying drawings, Figure 1 is a side elevation of the improved pile-cutting machine in position for work; Fig. 2, a front
45 end view, and Fig. 3 a plan view thereof.

Similar letters indicate like parts in all of the figures.

A A A represent a number of piles driven in several rows to serve as a foundation under water for a caisson or other superstructure,
50 and B B a pair of stringers severally secured to the piles above high-water mark in parallel

lines at a suitable distance apart to serve as a tramway for the pile-cutting machine. To facilitate the movement of the machine upon
55 this temporary tramway, metallic or wooden rails B' B' are laid in short sections upon the stringers B B, and the flanged wheels C C of the carriage D of the machine are mounted upon these rails. The carriage is constructed
60 simply of a bed-frame D' D', floored over to form a platform, and the axles for the wheels are journaled to rotate in suitable hangers E, dependent therefrom, as shown in Figs. 1 and 2. Upon the axle of one of the wheels C is
65 fixed a worm wheel or pinion *b*, which is engaged by a worm on the lower end of an upright shaft operated by a hand-wheel E', so that the carriage may be moved back and forth upon the tramway by turning said hand-
70 wheel. Upon this carriage D is erected a frame-work F F, whose upper timbers F' F' are made to project over beyond its front end, and are braced by the diagonal struts F² F², extending from the platform-frame
75 D' D'. From the front ends of said upper timbers F' F' the two vertical side bars G G of a dependent frame are suspended and made fast by suitable iron connections, and are steadied by braces G' G', extending
80 diagonally from the lower ends of the uprights G G on each side to the rear ends of the upper timbers F' F', and also by means of an upper and a lower horizontal transverse rail or beam H and H', preferably of wrought-
85 iron, mounted and secured upon iron brackets H² H², bolted to the inner faces of said uprights. Grooved or flanged wheels I I are mounted to travel upon said parallel rails and to support thereby the adjustable saw-frame
90 carrying the saw and its motor. This saw-frame is constructed of two horizontal pieces I' I', severally mounted upon the wheels I I, each immediately over its appropriate rail or beam H or H', and which are connected by
95 two vertical pieces J J, made fast to the inner faces thereof. The vertical pieces J J are so extended as to project below the ends of the uprights G G of the main fixed frame by which they are supported, and are fitted with cross-
100 beams M M', secured thereto, the one near to their lower ends and the other about midway their length, as shown in Figs. 1 and 3. Against the inner faces of these cross-beams

M M' are secured the bearings for the vertical shaft N, to the lower end of which is attached a circular saw O. The saw-shaft N is properly mounted in the usual manner to rotate freely in its bearings, and is fitted at its upper end with a driving-pulley P, Figs. 1 and 3, which is geared by a belt to a motor Q, mounted upon a platform S, secured to the uprights J J of the saw-frame at or below its upper cross-piece M', so as to project in front thereof, and which is properly braced by diagonal struts or brackets S' S', extending from the upright to the outer end of the platform, as shown in Fig. 1.

The motor Q may be of any approved description. Where a steam-engine is used the boiler T therefor is mounted upon the carriage D and serves to counterbalance the weight of the motor and saw-frame, the counterbalance being further maintained, as required, by means of pig-iron or other ballast placed upon the carriage, as shown at U in Fig. 1. The engine will receive steam from the boiler by means of a flexible steam-pipe T'.

One of the upper and one of the lower wheels carrying the saw-frame are severally fitted with pinions, each to engage a worm upon a vertical shaft K, (see Fig. 2,) mounted to rotate in suitable bearings in the upright supporting-frame, and this shaft is provided with a hand-wheel L, secured thereto in position to be readily reached and operated from the platform S, so that by turning said wheel the saw-frame may be made to travel back and forth upon the rails H and H'.

For the purpose of elevating the saw whenever it may be necessary to sharpen it or to have access thereto for any purpose, racks Z are formed upon the uprights J J of the saw-frame in position to be engaged severally by pinions Y upon a horizontal shaft Y', mounted upon a swinging frame X, pivoted on or between the upper timbers F' F' of the machine to admit of being swung into and out of engagement with said racks Z. The movement of the pinions Y to and from the racks Z is effected by means of a pair of toggle-levers W' W', pivoted at one end to a cross-bar in the frame-work F F, supporting the upper beams F' F', and at the other to the lower bar of the swinging frame X, and at their central intersection to the lower end of a rod W, dependent from one end of an oscillating frame V, secured to a cross-bar V', pivoted upon the upper beams F' F', as shown in Figs 1 and 3, so that by dropping the free end of the frame to a horizontal position the rod W will be drawn up, and by causing the toggles W' W' to bend upward will thereby draw the swinging frame X back from the racks Z, so as to leave the saw-frame free to travel upon the rails; but by elevating the free end of said frame V the toggles will be brought to a straight line and thereby force the pinions over into gear with the racks. The shaft Y' may be rotated as required by means of a pulley Y², geared to a crank-wheel Y³, mounted

in position to be operated from the platform of the carriage.

In the operation of the machine the carriage D is run out upon the stringers B B, mounted, as described, upon the piles A A A until the vertical saw-frame is brought in position in front of the outermost row or tier of piles. The saw-frame is then lowered into the water to the desired depth below the high-water level, and the lever V is brought down into a horizontal position, so as to disengage the pinions Y, by which the saw-frame was lowered, and leave the frame free to traverse upon the rails H H' in front of the row of piles to the extent of the width of the machine.

From the peculiar construction of the machine as described none of its weight will rest upon the outermost line of piles, so that they may be cut off without disturbing it. This operation is effected by first bringing the center of the saw-frame, and with it the saw O, opposite the center of one of the outer piles, and after setting the saw in motion by bringing the motor Q into action by turning the hand-wheel E' on the carriage so as to cause the latter to move gradually backward and carry the saw with it against the pile with a steady feed until it is cut through. When this is accomplished, a reverse movement of the carriage is effected, so as to carry the saw outward again, and the hand-wheel L is turned so as to cause the saw-frame and saw to move laterally until the saw is brought opposite the next outer pile, which is then cut off in like manner as the first. When all the outer row of piles have thus been cut, a short section of the front end of the tramway is cut away, and the machine is moved back to bring the saw into play against the next tier of piles, the rails being taken up section by section as the machine is carried off of them. Extra piles need to be driven at the inner end of those which are to be cut to afford a support for the machine after the permanent piles have all been operated upon. The framing of the machine is preferably so constructed that it may be taken apart to facilitate its removal and transportation.

I claim as my invention—

1. The combination, in a pile-cutting machine with its carriage moving upon a tramway, of a movable saw-frame and saw supported by the carriage and traversing its line of movement, a motor carried on the saw-frame and geared to the saw, and independent mechanism, substantially as described, for actuating the carriage and saw-frame, whereby the one is made to move at a right angle to the other for adjustment or feed, substantially in the manner and for the purpose herein set forth.

2. The combination, in a pile-cutting machine, of a carriage mounted upon wheels to run upon a tramway, a frame-work upon said carriage constructed to project beyond and overhang its front end, a fixed frame depend-

ing vertically from said frame-work in front of the carriage, a movable frame traversing the front of the carriage upon said dependent fixed frame, and a saw mounted upon 5 said movable frame and geared to a motor carried upon the same frame, substantially in the manner and for the purpose herein set forth.

3. The combination, in a pile-cutting machine, of a carriage mounted upon wheels to 10 run upon a tramway, a frame-work upon said carriage constructed to project beyond and overhang its front end, a fixed frame depending vertically from said frame-work in front 15 of the carriage, a movable frame traversing the front of the carriage upon said dependent fixed frame, a saw mounted upon said movable frame and geared to a motor carried upon the same frame, and a counterbal- 20 ancing-weight upon the carriage, substantially in the manner and for the purpose herein set forth.

4. The combination, in a pile-cutting machine with a carriage having a frame-work 25 thereon made to project and overhang its front end and a vertical frame fixed to the outer end of the projecting frame-work to depend therefrom in front of the carriage, of 30 parallel transverse rails secured to the up- rights of the dependent vertical frame, a saw-frame mounted upon wheels running upon said rails, a motor supported upon said frame, and a circular saw fixed upon a vertical shaft 35 rotating in bearings in said saw-frame and geared to the motor, substantially in the manner and for the purpose herein set forth.

5. The combination, in a pile-cutting machine with a carriage having a frame-work 40 thereon made to project and overhang its front end and a vertical frame fixed to the outer end of the projecting frame-work to depend therefrom in front of the carriage, of parallel transverse rails secured to the up-

rights of the dependent vertical frame, a saw-frame mounted upon wheels running upon 45 said rails, a saw carried thereby, a vertical actuating-shaft rotating in bearings in said frame, and worm-gear interposed between each end of said shaft and one of the wheels on each rail, substantially in the manner and 50 for the purpose herein set forth.

6. The combination, in a pile-cutting machine, of a carriage, a frame-work mounted thereon to project and overhang its front end, a fixed frame depending vertically from said 55 frame-work in front of the carriage, a movable saw-frame mounted upon said fixed frame, racks fitted to the uprights of said movable saw-frame, a swinging frame pivoted to the frame-work in front of the racks, pin- 60 ions upon an actuating-shaft mounted in said swinging frame to engage the racks, levers interposed between the swinging frame and the frame-work to form a toggle, and a lever 65 coupled to the toggle to move it and thereby actuate the swinging frame to throw the pin- ion into and out of gear, substantially in the manner and for the purpose herein set forth.

7. The combination, in a pile-cutting machine with the carriage and the saw carried 70 thereby, substantially in manner as described, of the driving-axle and wheels under the carriage, the vertical shaft rotating in bearings on the carriage and fitted with a hand-wheel, and the worm-gear coupling the shaft to said 75 axle and wheels to facilitate the movement of the carriage and the feed of the saw, substantially in the manner and for the purpose herein set forth.

In testimony whereof I have signed my name 80 to this specification in the presence of two subscribing witnesses.

EDWIN J. WESTON.

Witnesses:

E. H. THARP,
W. E. LAMB.