(No Model.) 4 Sheets—Sheet 1.

M. WALSH.

PILE DRIVER.

No. 431,539. Patented July 1, 1890.

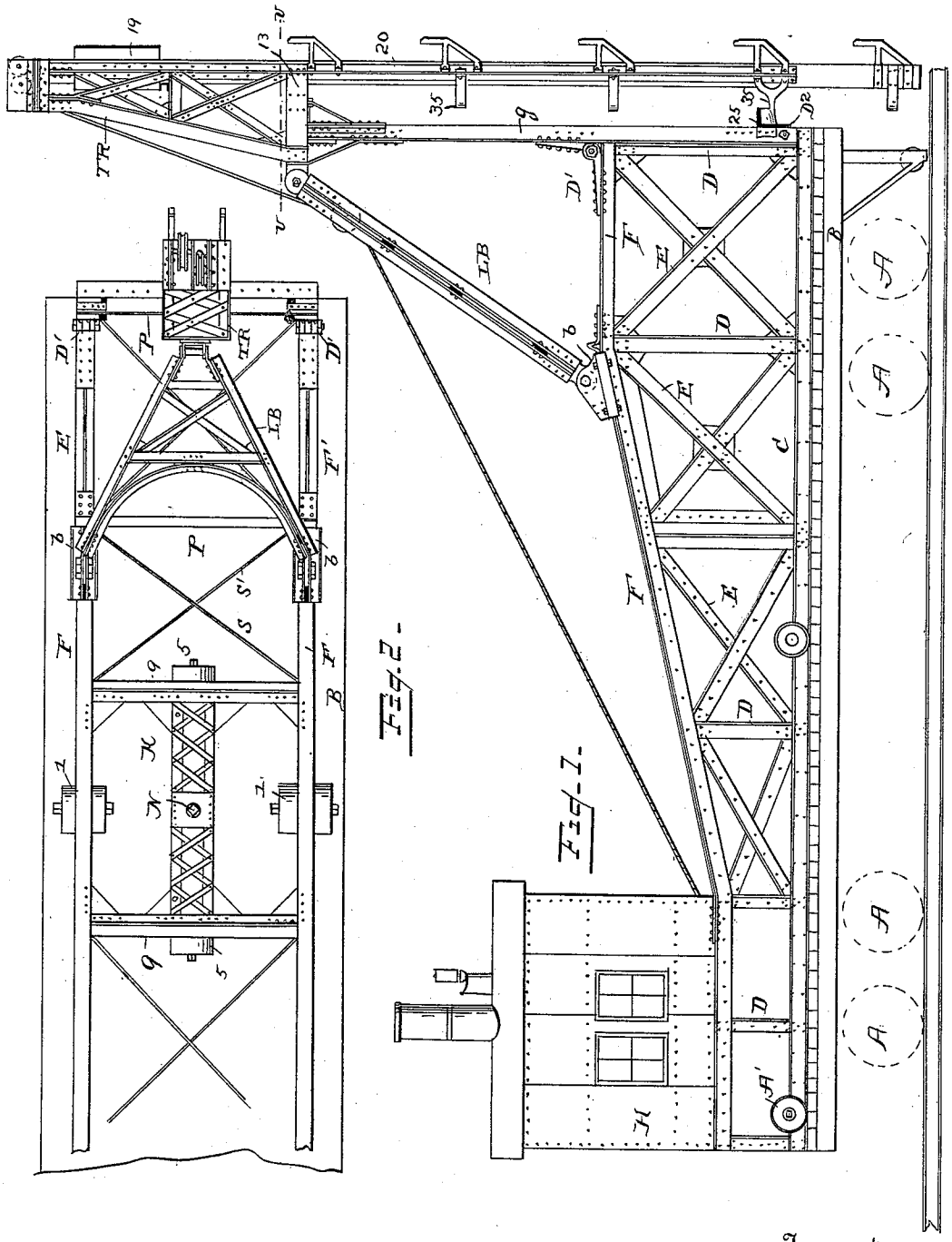


Fig. 2.

Fig. 1.

Witnesses
Ira R. Steward
Robert Burnett

Inventor
Michael Walsh
By Thos. & Boyd
Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.)

4 Sheets—Sheet 2.

M. WALSH.

PILE DRIVER.

No. 431,539. Patented July 1, 1890.

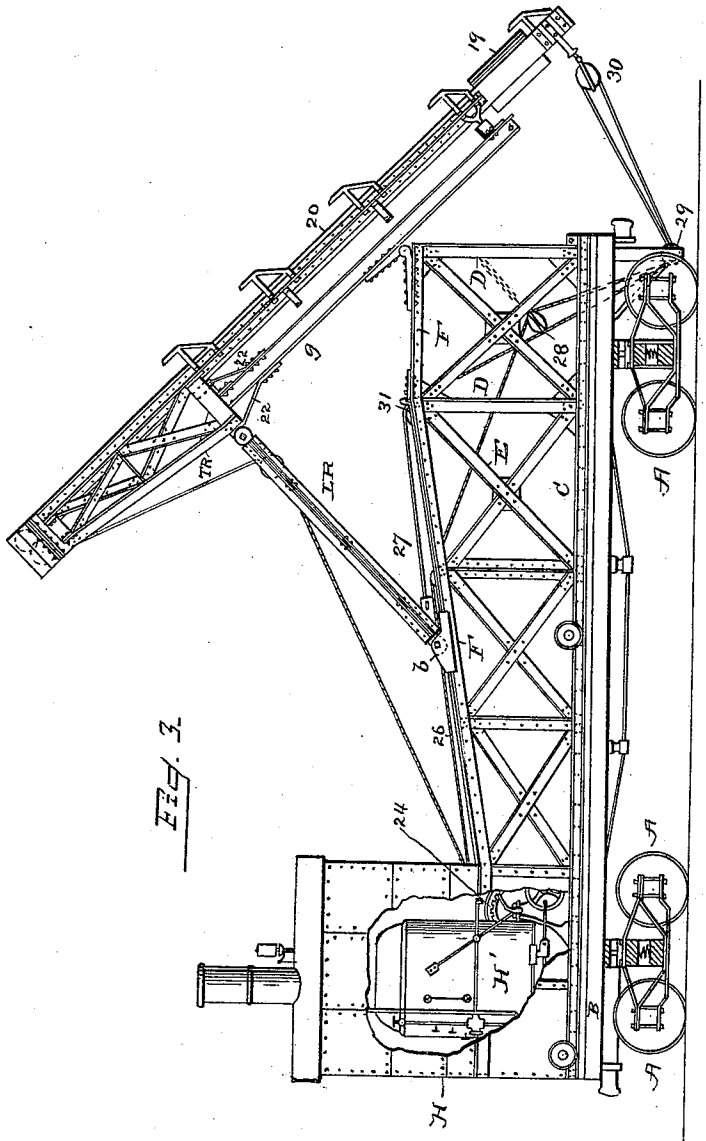


Fig. 1.

Witnesses
Ira R. Steward
Robert Swett

Inventor
Michael Walsh
By Wood & Boyd
Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 4 Sheets—Sheet 3.

M. WALSH.

PILE DRIVER.

No. 431,539. Patented July 1, 1890.

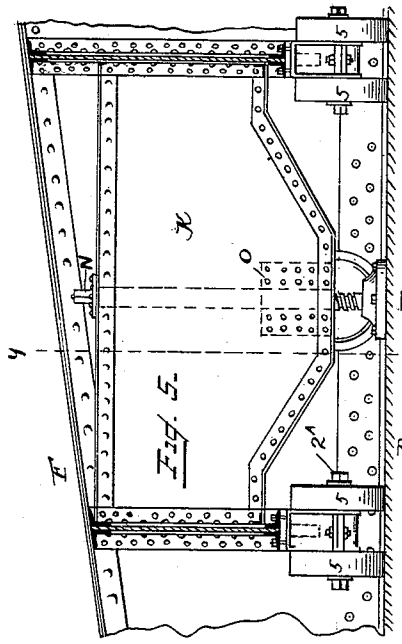


Fig. 5.

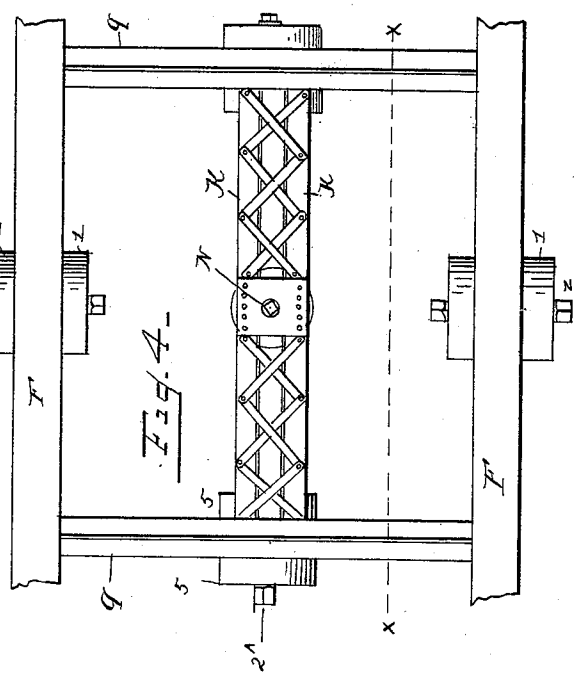


Fig. 4.

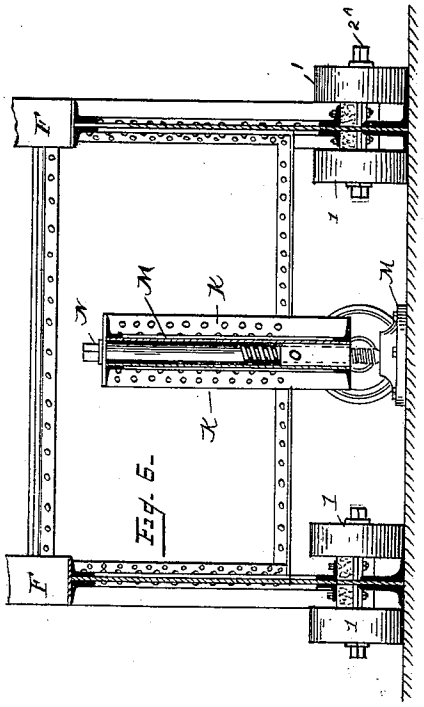


Fig. 6.

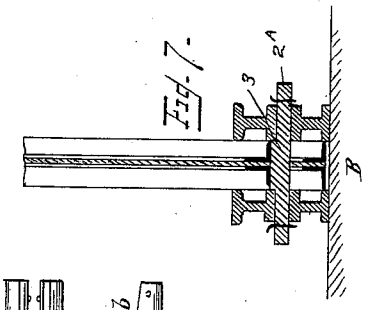


Fig. 7.

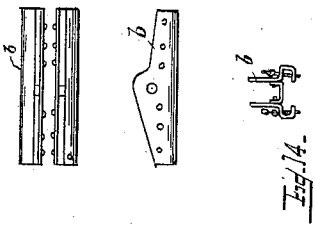


Fig. 14.

Witnesses
Ira R. Steward
Robert Connett

Inventor
Michael Walsh
By Wood & Boyd
Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 4 Sheets—Sheet 4.

M. WALSH.

PILE DRIVER.

No. 431,539. Patented July 1, 1890.

Fig. 8.

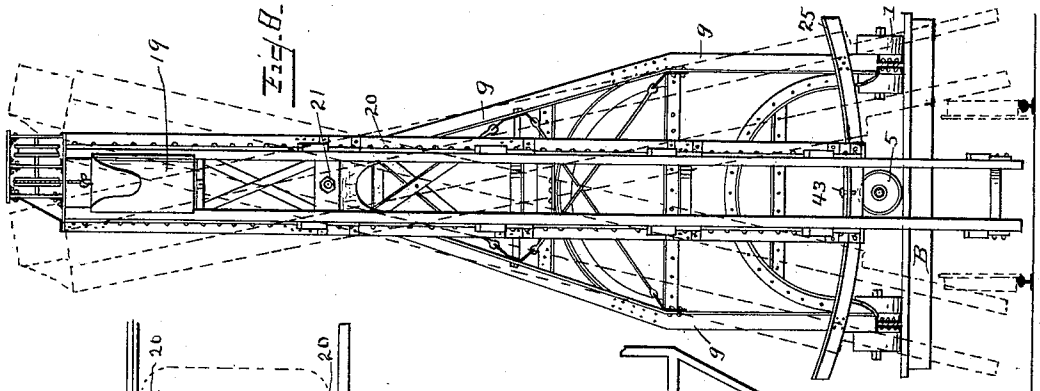


Fig. 9.

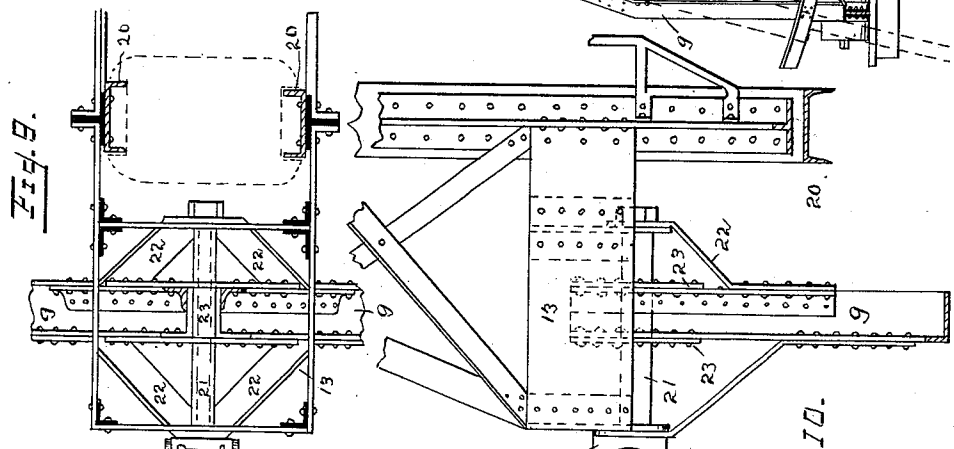


Fig. 10.

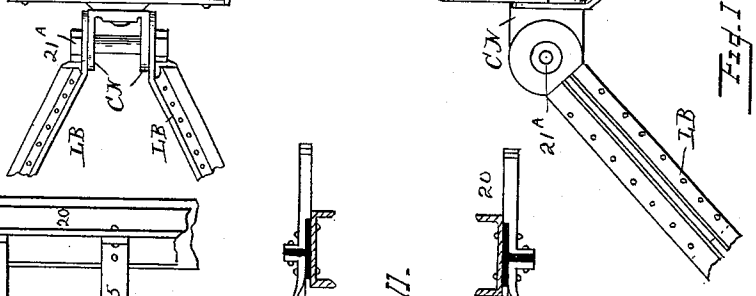


Fig. 12.

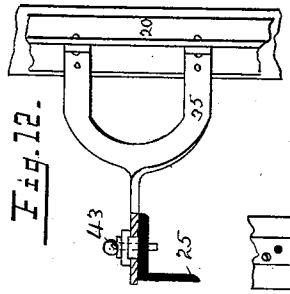


Fig. 11.

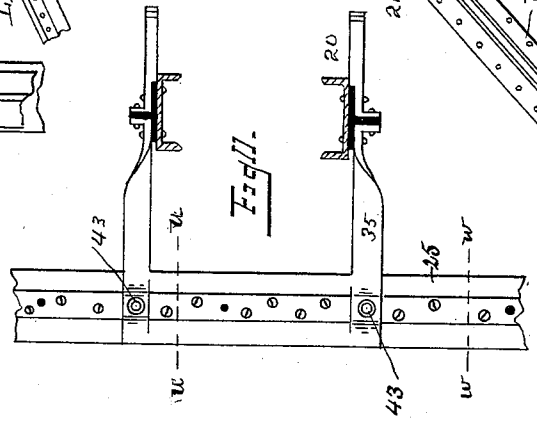
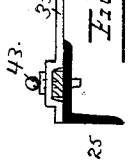


Fig. 13.



Witnesses
Ira R. Steward.
Robert Everett

Inventor
Michael Walsh
By Wood & Boyd
Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

MICHAEL WALSH, OF CINCINNATI, OHIO, ASSIGNOR OF ONE-HALF TO FREDERIC C. WEIR, OF SAME PLACE.

PILE-DRIVER.

SPECIFICATION forming part of Letters Patent No. 431,539, dated July 1, 1890.

Application filed February 5, 1890. Serial No. 339,364. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL WALSH, a citizen of the United States, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Pile-Drivers, of which the following is a specification.

My invention consists of an improved pile-driver designed for maintaining or constructing structures in which piles are used on railroads.

The objects of my invention are, first, to provide a quick and convenient method of raising the hammer-leads and to so assemble the different parts of the pile-driver that when the hammer-leads are raised the driver is ready for work, thus saving time and labor; second, when the pile-driver is at work and a train approaches in either direction to provide a quick and convenient method of lowering the hammer-leads and to so assemble the different parts of the pile-driver that when the hammer-leads are lowered the driver is ready for transportation through any bridges or tunnels, or under any overhead obstructions over the track between the approaching train and the nearest side track the pile-driver can be run on to clear the approaching train; third, to provide an improved means of connecting the hammer-leads with the other parts of the driver, so that piles guided by them may be driven vertically or at any reasonable angle from the vertical in any given direction; fourth, to connect the pile-driver with a strongly-built flat or platform car in such a manner that when there is no work for the pile-driver it may be detached from the car and the car put into transportation-service; fifth, to provide connections between the pile-driver and car which will admit of the driver being revolved on the car in any arc of a circle, or in a complete circle, permitting the ends of driver to be reversed on the car, thus avoiding having to take the driver to a turn-table when it is required to work in an opposite direction in case of washouts, and to admit of piles being driven at variable distances from the railroad-track center, and, sixth, to provide connections between the pile-driver and car which will admit of the driver being run backward or forward on the car, so that in cases of structures to be repaired being washed out or undermined, thereby being weakened, so that they will not carry the car and driver, the driver may be run forward on the car one panel-length in order to re-enforce or renew the bent ahead of the car each time, and when such repairs have been completed the driver may be returned to its original position on the car.

The methods by which all of the foregoing is intended to be accomplished will be fully set forth in the description of the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side elevation of my improvement in position for use. Fig. 2 is a top plan view of the front portion of the same. Fig. 3 is a side elevation showing the hammer-leads and their connections partly lowered and the method of lowering or raising the same. Fig. 4 is a top plan view of the attachments for pivoting and turning the driver on the car. Fig. 5 is a section on line $x\,x$, Fig. 4. Fig. 6 is a section on line $y\,y$, Fig. 5. Fig. 7 is a section through one of the journals on line $z\,z$, Fig. 4. Fig. 8 is a front elevation of Fig. 1. Fig. 9 is a section on line $v\,v$, Fig. 1. Fig. 10 is a side elevation of Fig. 9. Fig. 11 is a detail sectional view of the hammer-leads. Fig. 12 is a section on line $w\,w$, Fig. 11. Fig. 13 is a section on line $u\,u$, Fig. 11. Fig. 14 is a detail view of the shoe which is shown in top plan view, side, and end elevations.

A A represent ordinary car-trucks.

B B represent a strongly-built flat or platform car resting on its trucks and carrying the pile-driver.

C, E, D, F, and F′, Figs. 1 and 2, represent chords, struts, and braces, which, when built up, as shown, form twin composite girders, connected with each other by cross-girders $q\,q$ and struts P P and braced by lateral rods S S. The cross-girders $q\,q$ are in turn connected together by the twin girders K K, between which at their bottom center is firmly secured the female screw O, (see Fig. 6,) through which passes the male screw N, which is stepped in socket-shoe M, the whole forming a rigid frame-pivoting screw N in socket M.

To the front end of the main frame is hinged at D′, Fig. 1, the leader-supporting frame *g*, which is also connected with the frame at its bottom ends by pin D^2, Fig. 1. The leader-supporting frame *g* is composed of bars which are connected at their head by the eye-plates 23 and bent eye-plates 22, through which passes axial journal 21, Figs. 9 and 10. The frame *g* carries a swiveled yoke C N, which is provided with a transverse axial journal 21^A, to which the leader-braces L B are also swiveled, thereby forming a universal joint for the connection of the leader-braces, which are hinged to shoes *b*, which journal on the incline tramways F, so that the tower-frame T R, which is mounted upon the yoke 13, may be adjusted to any vertical angle when the shoes are inclined in the opposite direction. Attached to and suspended in this tower are the hammer-leads 20, Figs. 1, 8, 9, and 10, which guide the pile-hammer 19, Figs. 1, 3, and 8. Owing to the rocking adjustment of the tower T R, the hammer-leads are permitted to swing as a pendulum, as shown by dotted lines, Fig. 8. The hammer-leads are connected with the frame or supports *g* by the segment-beam 25. Details of this construction are shown in Figs. 11, 12, and 13. Beam 25 is bent to the arc of a circle, the radius of which is the distance between the center of pin 21 and the face of beam 25, the hammer-leads being swung to any desired angle and fastened to beam 25 by bolts 43. (Shown in Figs. 11, 12, and 13.)

H, Fig. 1, represents an engine or cab-house inclosing a boiler and double-cylinder friction-clutch engine H′, Fig. 3, which furnishes the power for driving piles, moving and turning the driver, &c. Pivotal screw N is so located that the weight of cab-house H and engine and boiler H′ and that portion of the frame back of the screw-step is counterbalanced by the hammer-leads and hammer and that portion of the frame forward thereof. To maintain the equilibrium of this balance in case of turning, the driver, the double radial wheels 1 and 5, Figs. 4, 5, 6, and 7, are placed and connected with girders and cross-girders, as shown.

2^A, Fig. 7, represents the axle on which the wheels 1 and 5 journal. It is provided with an eccentric axis 3 between the pairs of wheels, so that when the pivotal screw N is screwed hard down and takes the weight the axle 2^A may be turned with a wrench and by means of its eccentric motion lift the wheels 1 and 5 above the lower edge of the main frame, after which the screw N is unscrewed until the lower edge of said main frame rests solidly upon the platform of the car-truck, which is the correct position of these parts for driving piles. Wheels 5 are pivoted under cross-girders *q*, so that in case of working the driver backward or forward on the car they may be turned at right angles to their radial position and be used for assisting wheels 1 and A′ in carrying the driver backward or forward on or off the car. Wheels A′ are also provided with eccentric axles for the purpose named.

The leader-frame *g* is raised and lowered by the tackle attached to the engine.

26 represents a rope passing from the rope-operating drum 24 of the engine over sheave 27, and thence over sheave 28 29, thence over sheave 30, which is shackled to the lower end of the leaders 20, as shown in Fig. 3, thence back through a second sheave 29, thence over sheave 31, and attached to the shoes *b* of the leader-braces L B. By this means as the engine-drum 24 is turned in one direction the leader-frame *g* is elevated, and as it turns in the reverse direction it is lowered. The leaders 20 are connected by a U-frame 35, which frame rests upon the segmental tramway 25.

43 represents bolts which pass through the frame 35 to secure it to the tramway and hold the leaders to any desired angle of inclination. The frames are preferably made of I-beams or angle-irons riveted together in the manner shown, which is deemed the best form of construction; but I do not wish to limit myself to the details of construction of the frame.

Additional wheels to support the central structure and allow it to be turned on the table may be applied at pleasure.

Having described my invention, what I claim is—

1. A pile-driver supported upon a frame and provided with radial wheels 1 and 5, which are journaled upon the eccentric axles 2, in combination with the pivotal jack-screw N, secured to the frame and stepped upon the platform of the car, whereby the wheels may be turned with the eccentric axle to shift the weight to and from the wheels, substantially as specified.

2. A pile-driver having the engine and driving apparatus supported upon opposite ends of a portable platform, journaled upon eccentric axles 2, and the elevating device N for lifting the frame to permit turning the eccentric axle to shift the weight off the wheels to the sills of the frame, substantially as specified.

3. The combination, with a portable platform-car, of a frame carried thereby and turning on the wheels 1 and 5, a pile-driver supported by said frame, a screw N for raising and lowering the frame relatively to the car, and means for adjusting said wheels to permit lowering the frame, substantially as described.

4. The combination, with a pile-driver main frame having a tramway F, of the leader-frame *g*, pivoted to the main frame, the leader-braces L B, having shoes movable on the tramway, the engine-drum 24, and the cable 26, passing over sheaves attached to the lower end of the leader-frame and connected with the shoes of the leader-braces, substantially as described.

5. The combination, with a portable plat-

form, a pile-driver main frame supported thereon, of a leader-frame *g*, hinged to said main frame by a pivot D′ and at its end above the latter provided with the journals 21 and 21ᴬ, located at right angles to each other, the tower-frame carrying the hammer-leaders and hung on one of said journals, the leader-braces L B, secured to the other journal, and means for moving the leader-braces and adjusting the hammer-leaders laterally, substantially as described.

In testimony whereof I have hereunto set my hand.

MICHAEL WALSH.

Witnesses:
T. SIMMONS,
C. W. MILES.