No. 839,246. PATENTED DEC. 25, 1906.

W. A. WILLIAMS.

PILE DRIVER AND STONE BREAKER.

APPLICATION FILED MAY 23, 1906.

Fig. 1.

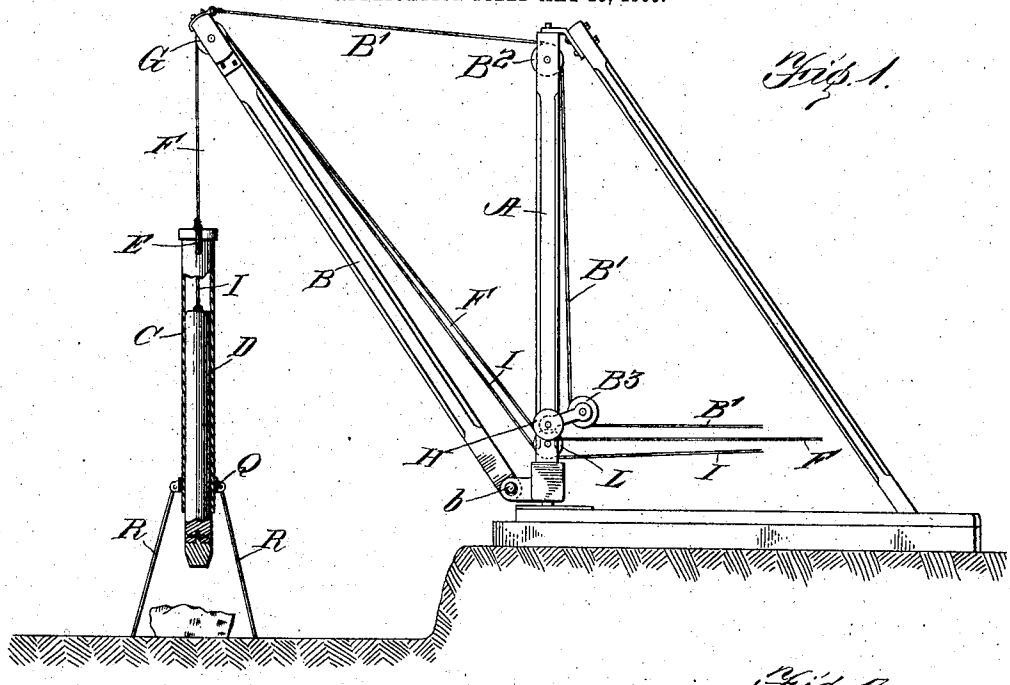



Fig. 3.

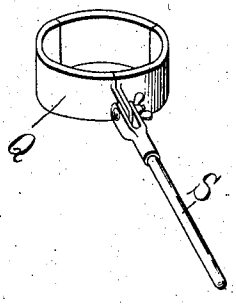



Fig. 2.

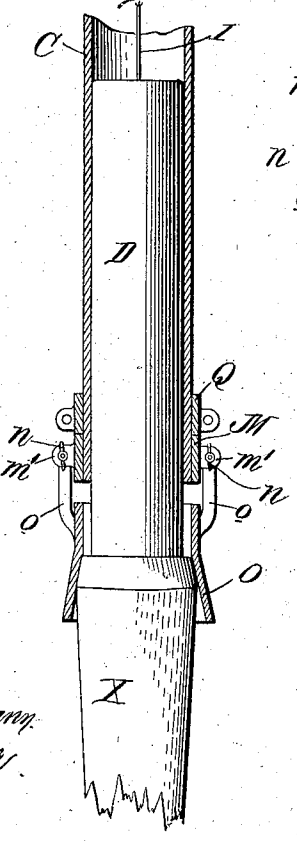



Fig. 4.

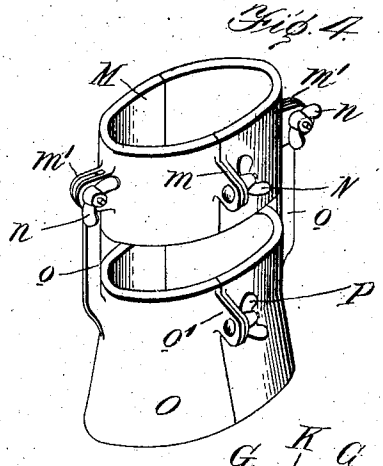
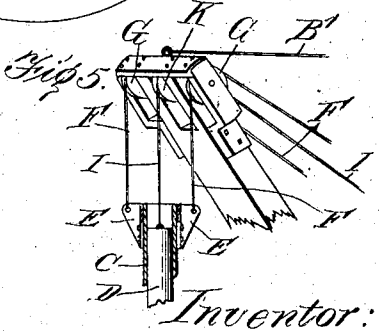



Fig. 6.




Fig. 5.




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# UNITED STATES PATENT OFFICE.

WILLIAM A. WILLIAMS, OF EASTON, PENNSYLVANIA.

## PILE-DRIVER AND STONE-BREAKER.

No. 839,246. Specification of Letters Patent. Patented Dec. 25, 1906.

Application filed May 23, 1906. Serial No. 318,334.

*To all whom it may concern:*

Be it known that I, WILLIAM A. WILLIAMS, a citizen of the United States, residing in Easton, in the county of Northampton and State of Pennsylvania, have invented certain new and useful Improvements in Pile-Drivers and Stone-Breakers, of which the following is a specification.

My invention relates to mechanism for driving piles and breaking stones of the class in which a vertically-reciprocating hammer is supported by a derrick by means of which it can be conveniently moved from place to place as required.

The object of my invention is to simplify mechanism of this class, make it strong, durable, and accurate, as well as free from jars and undue strains.

In carrying out my invention I provide a derrick of any suitable kind, and from the boom thereof I suspend, by means of ropes or other suitable flexible supports, a tubular guide for a hammer, which latter is adapted to reciprocate vertically in the guide. Devices are provided for clamping the guide to a pile for supporting it on a stone or over stones to be broken and for moving it from place to place as required.

In the accompanying drawings, Figure 1 is a view, partly in side elevation and partly in vertical section, of my improvements. Fig. 2 is a view, on an enlarged scale and in vertical section, showing particularly how the tubular hammer-guide is clamped to a pile. Fig. 3 is a perspective view of the handle employed for moving the hammer-guide when breaking stone. Fig. 4 is a perspective view of the devices employed for clamping the guide to a pile. Fig. 5 is a detail view in perspective, showing the upper end of the derrick-boom and the devices employed for suspending therefrom the hammer-guide and the hammer. Fig. 6 is a perspective view of one of the legs of the tripod employed for supporting the hammer-guide when breaking stone.

The derrick may be mounted on a barge when driving piles or on any suitable support or foundation when breaking stone.

The vertical post A of the derrick is pivoted to its support, and the boom B is hinged at *b*, as usual, so that its outer end may be adjusted vertically to any desired extent. A rope B′, attached to the outer end of the boom and passing over pulleys $B^2$ $B^3$, is employed for raising and lowering the boom. The hammer-guide C is tubular. It need not be made exactly cylindrical, as shown in the drawings, but it should be such as to permit the hammer D to be reciprocated vertically and to be confined in the guide. At its upper end the guide C is provided with laterally-projecting ears E, to which are attached the suspending-ropes F, that extend over pulleys G on the end of the boom, pass down to the base portion of the mast A, and then pass under pulleys H. By these means the guide may be raised and lowered to any desired extent and held at any desired elevation. The ropes or other flexible means employed, while securely holding the guide, prevent any jars or strains from being communicated from the guide to the derrick when the hammer is in operation. The hammer D is suspended by means of a rope or other flexible support I from the outer end of the boom. The rope passes over a pulley K in the upper end of the boom and then under a pulley L at the bottom of the mast A. This rope may be attached to any suitable engine or mechanism for raising and dropping the hammer.

When the mechanism is being employed for driving piles, I preferably employ devices for clamping the tubular guide to the pile in the manner illustrated in Fig. 2. These devices preferably consist of a split ring M, having ears *m*, connected by screws N and formed with ears *m′* to receive the upwardly-projecting arms *o* of the clamping member O. The arms *o* are detachably connected with the ears *m′* by the screws *n*. The clamping member O is made in two parts and formed with ears *o′*, attached by screws P. As thus constructed the clamping members O when separated can be applied to a pile X and then clamped thereon. The clamping member M may be clamped on the tubular guide and then the arms *o* attached to the ears *m′*. When thus connected, the hammer may be reciprocated vertically in the guide and apply blow after blow to the top of the pile. As the pile is driven the guide descends with it. The clamping member O is flared outwardly and downwardly, as shown, so that it may be readily applied to the pile and will give some freedom of movement.

When the mechanism is employed for breaking stone, the clamping members M and O are not used. If the mechanism is used for breaking a large stone, I preferably support the guide C over the stone in the manner illustrated in Fig. 1. For this purpose a split

ring Q is employed which is clamped to the guide and to which the legs R of a tripod are attached. The legs of the tripod are hinged to the ring, and one of these legs may be used as a handle for moving the guide into position over the stone to be broken. When the mechanism is being used for breaking small stones, I preferably dispense with the tripod, removing the legs R and substitute for one of them a handle S, such as shown in Fig. 3. When the handle is thus applied, the guide may be moved within certain limits to locate the hammer over the stones to be broken and the hammer may be reciprocated by the automatic mechanism.

It will thus be seen that the mechanism is very simple in construction and operation and that it can be used for driving piles, as well as breaking stones, without imparting jars, vibrations, or strains to the derrick mechanism.

I claim as my invention—

1. The combination of a derrick, a tubular hammer-guide flexibly suspended therefrom and adjustable vertically thereon, a hammer reciprocating vertically in the guide and flexible means for raising and lowering the hammer.

2. The combination of a derrick, an inflexible tubular hammer-guide suspended therefrom and adjustable vertically thereon, a hammer reciprocating vertically in the guide and clamping devices at the lower end of the guide.

3. The combination of a derrick, an inflexible tubular hammer-guide suspended therefrom and adjustable vertically thereon, a hammer reciprocating vertically in the guide, and means for supporting or steadying the guide applied to the lower end thereof.

4. The combination of a derrick, a tubular hammer-guide suspended therefrom and adjustable vertically thereon, a hammer reciprocating vertically in the guide, a sectional detachable clamping member secured to the lower end of the guide, and a sectional detachable clamping member connected therewith having a lower flared portion for the purpose specified.

5. The combination of a supporting-frame, an inflexible tubular hammer-guide flexibly suspended therefrom and adjustable vertically thereon, a hammer reciprocating vertically in the guide and flexible means for raising and lowering the hammer.

In testimony whereof I have hereunto subscribed my name.

WILLIAM A. WILLIAMS.

Witnesses:
CHAS. B. BRUNNER,
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