

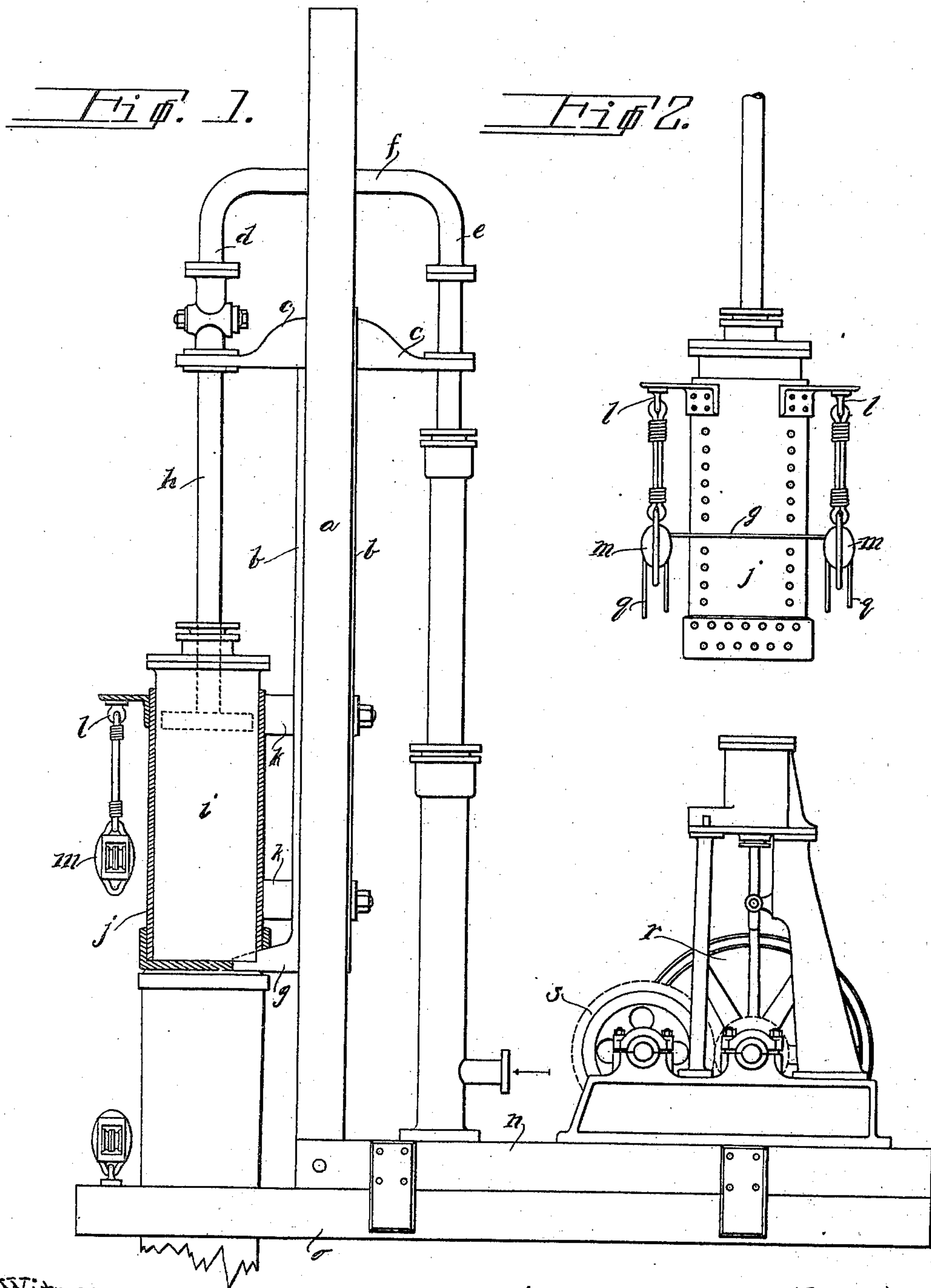
No. 693,600.

Patented Feb. 18, 1902.

J. GRAPENGETER.  
STEAM PILE DRIVER.

(Application filed Dec. 10, 1900.)

(No Model.)



Witnesses:

J. D. Arty McMahon.  
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# UNITED STATES PATENT OFFICE.

JOHANNES GRAPENGETER, OF HAMBURG, GERMANY.

## STEAM PILE-DRIVER.

SPECIFICATION forming part of Letters Patent No. 693,600, dated February 18, 1902.

Application filed December 10, 1900. Serial No. 39,433. (No model.)

*To all whom it may concern:*

Be it known that I, JOHANNES GRAPENGETER, machinist, a subject of the German Emperor, residing at Ankermannstrasse 19, Hamburg, in the German Empire, have invented new and useful Improvements Relating to Steam Pile-Drivers, (for which I have made applications for patents in Germany, dated November 3, 1900, and in Great Britain, dated November 10, 1900,) of which the following is a specification.

My invention relates to improvements in steam pile-drivers, the object of which is to provide the ordinary steam pile-driver with a tackle having differential pulleys in such a manner that a pulling force is exerted upon the pile when the ram-block strikes the pile, thereby facilitating and accelerating the driving of the pile.

The invention consists in the construction and combination of the parts described herein and illustrated by the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, of the pile-driver; and Fig. 2, a front elevation of the ram-block.

Between two guide-rods *a* the guide-bars *b* are arranged, connected at their top by a cross-head *c* and provided at their lower ends with a projecting flange *g*, which carries the whole apparatus and is placed upon the pile to be rammed and moved down during ramming, guided by the rods *a*. The cross-head *c* carries the ends *d* and *e* of the steam-pipe *f*. The end *e* of the steam-pipe is connected with the hollow piston-rod *h* of the steam-cylinder *i*, which serves as a ram-block and is inclosed in a casing *j*, provided with shoes *k*, which are slidingly connected with the guide-bars *b*. At the outer side of said casing are fastened in a suitable manner at *l* the top tackles *m*, provided with differential pulleys. The bottom tackles *p* are fastened to the ends of the two timbers *o*, which are part of the framing-timbers *n*, serving as a foundation, and are slidingly movable parallel with each other. The rope *q* of the engine *r*, fastened to the drum *s*, is carried over suitably-arranged guide-rolls and over the pulleys of the tackles and fastened to the casing *j*.

The working of the apparatus is as follows: A pile is set below the casing *j* and the flange *g*, and then the valves of the ram-cylinder and of the engine are opened. The ram-cylinder *i* is prevented from following the direct pressure of the steam, because the piston-rod *h* is fastened to the cross-head *c*, and therefore being movable it takes a slide motion, similar to that of a ram-block moved by hand. In the meantime the rope *q* has been tightened by the action of the engine, and as the engine is under steam-pressure the casing *j* is continuously under the influence of the tackles, and when the ram-cylinder is rushing down and striking the bottom of the casing which rests upon the pile the pressure of the casing upon the pile is greatly enhanced by the pulling force of the engine, and such force will by *vis inertiae* maintain the driving of the pile for a brief instant. As the pile is driven in the ram-cylinder is sliding down, following the direction of the pile, until the pile has been driven to the desired depth. The ram-cylinder is then raised, the beams *o* drawn back, and the pile-driver moved bodily. A fresh pile is then placed beneath the ram-cylinder, the beams *o* pushed forward, and the pile is driven, as described above.

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

A steam pile-driver having a ram-block in shape of a steam-cylinder placed in a casing which is set upon the pile to be driven and receives the strokes of said steam-cylinder, against its bottom, in combination with rope connection of tackles with differential pulleys between the casing and the foundation of the pile-driver and with a drum of the engine, whereby a continuous pressure is exerted upon the pile through the casing in the longitudinal direction of the pile.

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

JOHANNES GRAPENGETER.

Witnesses:

E. H. L. MUMMENHOFF,  
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