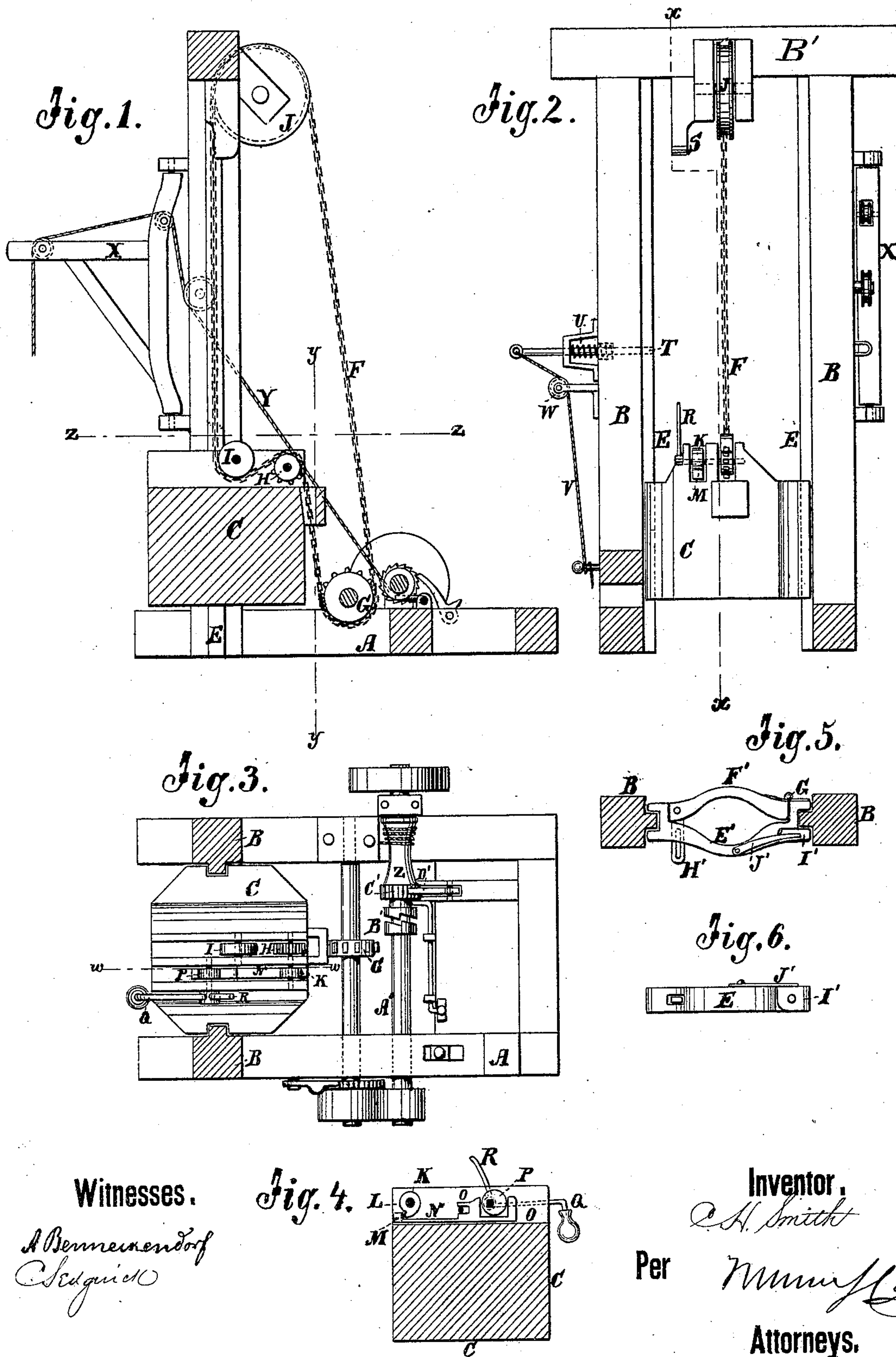


C. H. SMITH.  
Pile-Drivers.

No. 141,086.

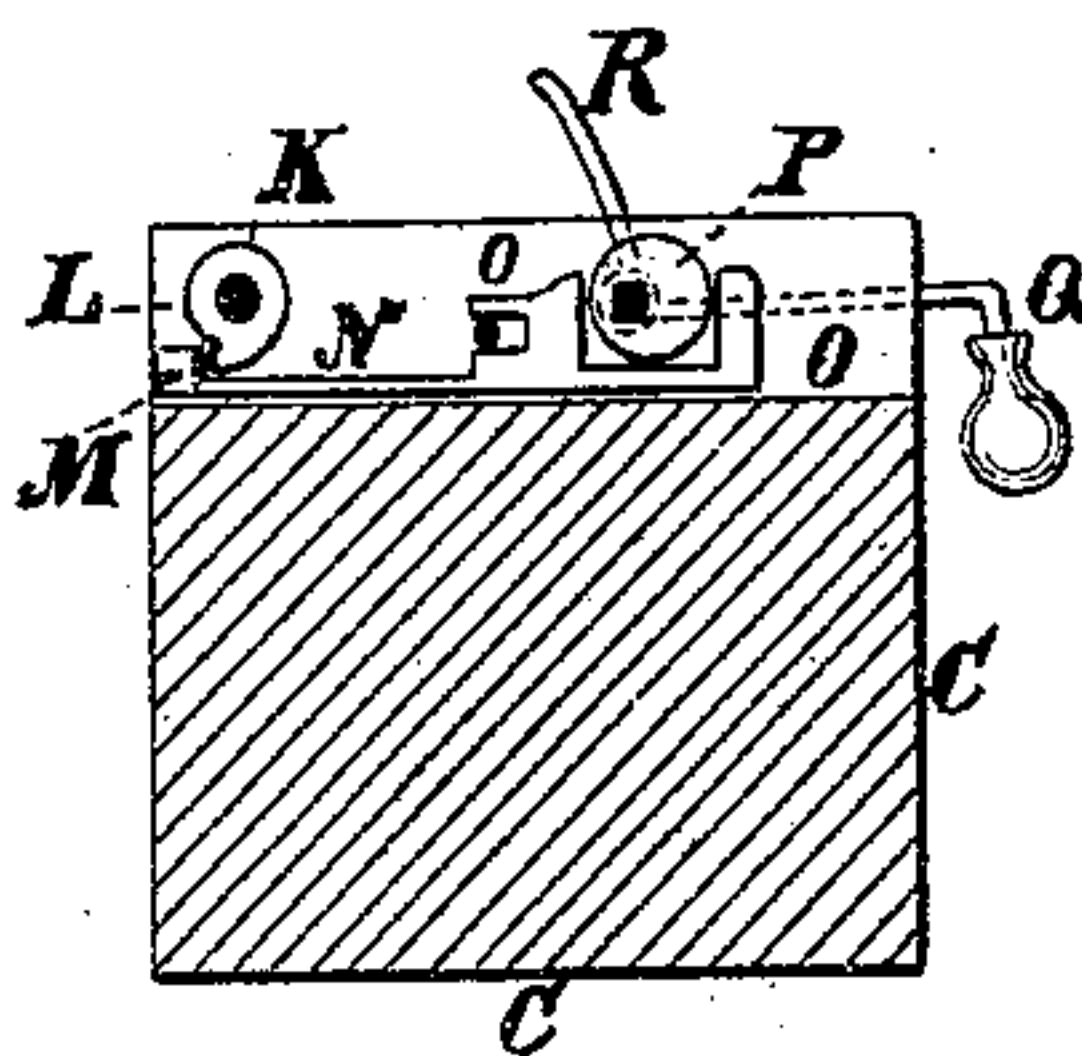
Patented July 22, 1873.



Witnesses.

A Bennekenendof  
C Sedgwick

Fig. 4.



Inventor.

C. H. Smith

Per

Munn & Co.

Attorneys.



# UNITED STATES PATENT OFFICE.

CHARLES H. SMITH, OF BLOOMER, WISCONSIN.

## IMPROVEMENT IN PILE-DRIVERS.

Specification forming part of Letters Patent No. **141,086**, dated July 22, 1873; application filed May 10, 1873.

*To all whom it may concern:*

Be it known that I, CHARLES H. SMITH, of Bloomer, in the county of Chippewa and State of Wisconsin, have invented a new and useful Improvement in Pile-Drivers, of which the following is a specification:

My improvement in pile-drivers consists of an endless chain for raising the drop, working over a driving-wheel at the bottom and a drum at the top of the frame, and through contrivances on the drop, with which a lock and a trip are arranged, so that a weight causes the lock to engage the chain when the drop strikes, so that the chain immediately lifts the drop again, and thus saves the time lost in the ordinary pile-drivers in running the hooks down to connect with it. The lock is tripped at the top of the frame, or at any desired intermediate point, by an arm coming against any suitable stop in the ascent of the drop. My invention also consists of a crane and hoisting-rope combined with the driver and the driving mechanism in a simple manner, for raising a pile while another is being driven by the same driving-gear by which the drop is worked. My invention also consists of a guide for controlling the head of the pile while being driven, contrived so as to be engaged with the rib-guides, on which the drop works, after being attached to the head of the pile before it is raised up to be fixed in the machine.

Figure 1 is a sectional elevation of a pile-driver constructed according to my invention, the section being taken on the line *x x* of Fig. 2. Fig. 2 is a sectional elevation taken on the line *y y* of Fig. 1. Fig. 3 is a horizontal section taken on the line *z z* of Fig. 1. Fig. 4 is a section of the drop on the line *w w* of Fig. 3. Fig. 5 is a plan of the clamp and section of the guide-posts, and Fig. 6 is a side elevation of the clamp.

Similar letters of reference indicate corresponding parts.

A represents the bed-frame; B, the posts, and B' the cap, of the frame of a pile-driver of any approved form. C is the drop, which works up and down on the guide-ribs E in the usual manner. F is the endless chain which I propose to use for raising the drop. It works over the driving drum or wheel G at the bottom, over the wheel H, and under the wheel

I, on the drop, and over the drum J, suspended from the cap. The driving-wheel G, also the wheel H, are toothed, to engage the links of the chain to prevent it from slipping. The shaft of wheel H, which is mounted on the drop, has a little wheel or disk, K, with a projection, L, on the face, which is engaged by the hook or shoulder M of a slide, N, arranged under said wheel K, in a groove, O, in the drop, and having an eccentric, P, for working it one way to engage the wheel K to lock the chain, and the other way to release it. The shaft of this eccentric has a weighted arm, Q, to move the slide in the direction to lock the chain, and a trip-lever, R, to move it the other way for unlocking it. The weight, being down, holds the slide so as to lock the wheel K. This prevents the wheel H from turning, so that the chain, which cannot slip on it, raises the drop until the lever K comes against the stop S at the top of the frame or T, at an intermediate point, and is held thereby, so that it turns eccentric P and releases wheels K and H, which lets the drop fall instantly, when it strikes the weight Q, throws the slide back, and locks the chain again, so that it lifts the drop immediately after it strikes the blow, and thus saves the time lost in the ordinary drivers in re-engaging the chains or hoisting-ropes. The intermediate stop T is thrown out by a spring, U, when not wanted, and back by a rope, V, and pulley W, when it is to be used. Several of these may be used at different heights, or one made adjustable. To hoist the piles up, ready for adjusting in the driver, I propose to have a crane, X, with a hoisting-rope, Y, working over suitable pulleys and on the drum Z on the driving-shaft A', and provided with a clutch, B', to set it in motion when required; also, provided with a holding-ratchet, C', and pawl D', to hold the pile up after it has been raised until it is swung into place. The guide for controlling and guiding the head of the pile consists of the two curved bars E' F', jointed together at G' at one end, and fastened at the other by the slotted link H' and a key. The bar E' has notches in the ends to fit on the guides E, and one of the end projections I' is arranged like a button, to turn down, so that said end can swing into place past the rib E after the other end of the guide

has been adjusted with its guide-rib. The said end is then turned back into position, and held by a spring, J'. Thus the guide is readily fitted in its place after being fastened to the pile on the ground, where it can be conveniently adjusted, and it holds the head and guides it until the pile is driven. Several of these guides will be used, so that while one is on the pile being driven another can be fitted on the next pile.

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

1. The combination, with a rag-wheel, over which passes the chain by which the hammer is raised, of a ratchet, K L, on the rag-wheel

shaft, and a subjacent sliding pawl, to enable the hammer to be locked to and unlocked from the chain, in the manner described.

2. The combination, with chain F, wheel G, and drum J, of rag-wheel H and centering-wheel I journaled in the drop, to give a non-frictional perpendicular rise and fall.

3. The combination, with movable detent pawl or slide N that locks the rag-wheel shaft, of a shaft having eccentric P and trip-arm R thereon, and with a stop, T or S, to enable the hammer to be tripped at the times and in the manner set forth.

Witnesses:

CHAS. H. SMITH.

T. B. MOSHER,

ALEX. F. ROBERTS.