

(No Model.)

2 Sheets—Sheet 1.

J. WHITE & A. O. KITTREDGE.
DROP HAMMER.

No. 511,381.

Patented Dec. 26, 1893.

Fig. 1.

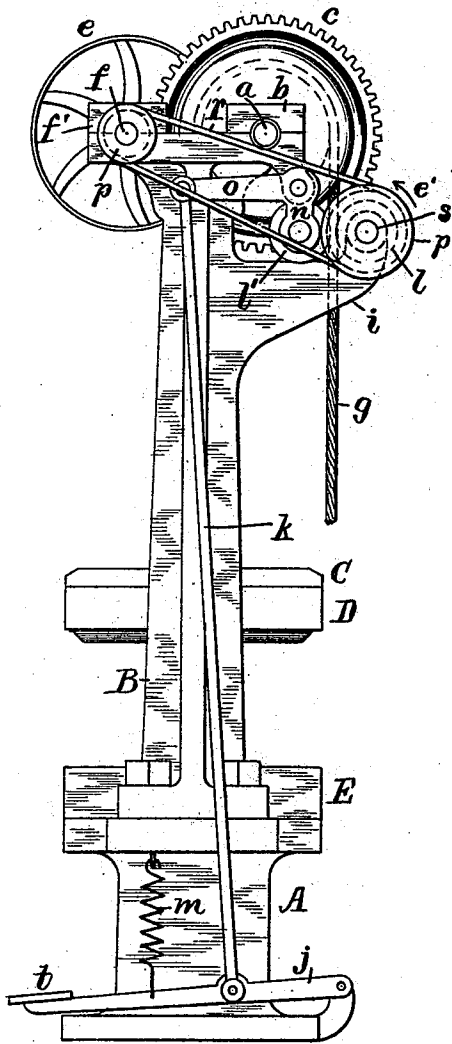
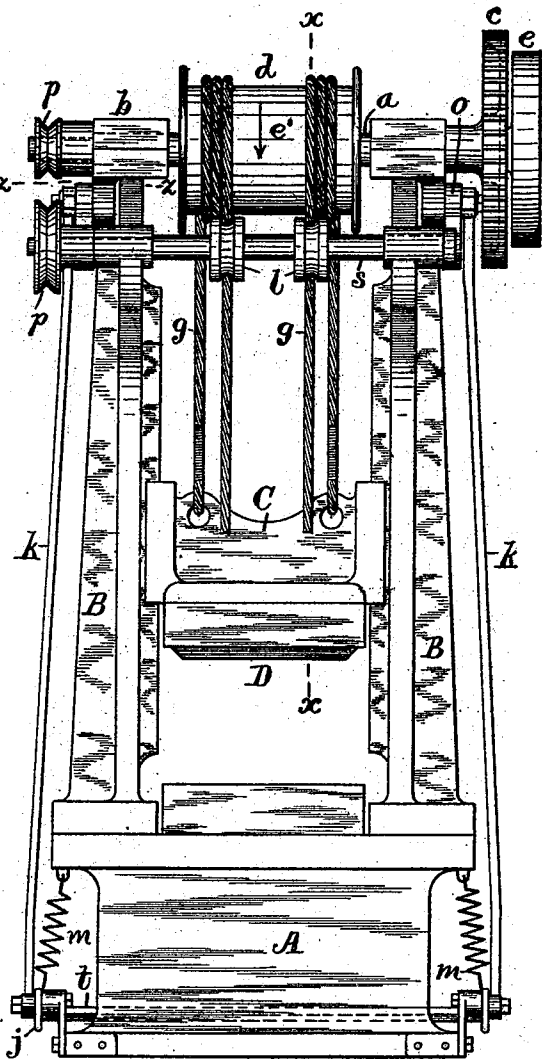


Fig. 2.



Attest:
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Clerk. *J. White and A. O. Kittredge*
per Crane & Miller, Attys.

(No Model.)

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Fig. 3.

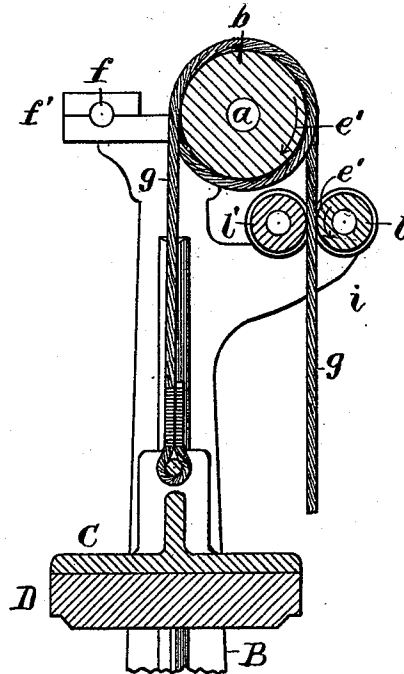
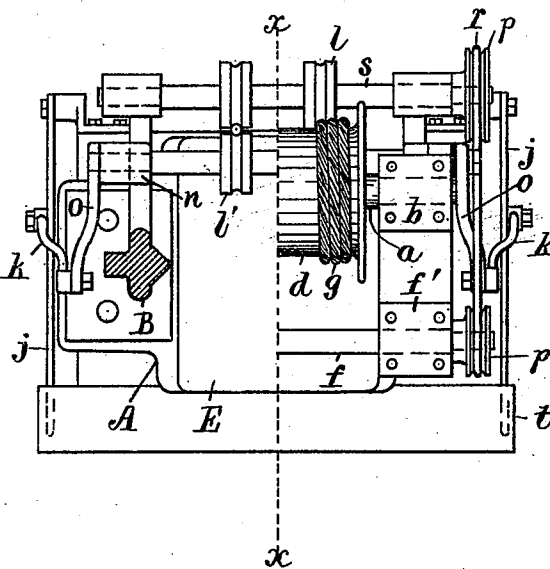


Fig. 4.



Attest:
L. Lee.
Chas. F. Kinsley

Inventors.
J. White and A. O. Kittredge,
per Crane & Miller, Attys.

UNITED STATES PATENT OFFICE.

JAMES WHITE AND ANSON O. KITTREDGE, OF BROOKLYN, ASSIGNORS
TO THE TWIST PIPE COMPANY, OF NEW YORK, N. Y.

DROP-HAMMER.

SPECIFICATION forming part of Letters Patent No. 511,381, dated December 26, 1893.

Application filed December 5, 1892. Serial No. 454,040. (No model.)

To all whom it may concern:

Be it known that we, JAMES WHITE and ANSON O. KITTREDGE, citizens of the United States, both residing at Brooklyn, Kings county, New York, have invented certain new and useful Improvements in Power-Lifters for Drop-Presses, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to drop presses in which the hammer or "force" is lifted by the frictional contact of a rope or strap with a revolving drum. In such presses, the rope or strap is attached at one end to the hammer, and the other end after being wrapped loosely over or around the revolving drum, is extended past the same, to be pulled when it is required to lift the hammer.

Heretofore, the rope or strap has been pulled or tightened by the hand of the operator, which has been applied to grasp and pull the same with the desired tension, and the object of the present invention is to grip and pull the rope or strap mechanically; so that the operator's hands may be wholly at liberty. He is thus enabled to use his hands more freely and rapidly in manipulating the objects which are submitted to the action of the "force."

In the present invention, the rope is extended between friction rolls which are pressed together at the pleasure of the operator by means of a treadle, and the rise and fall of the hammer is thus controlled without the use of the operator's hands.

Our construction is an improvement upon the "lifter for drop press hammers" claimed in F. W. Thompson's patent, No. 488,620, issued December 22, 1892, and we hereby disclaim the said Thompson's invention.

In lifting heavy forces a strap, extended half way around the drum, in the usual manner, does not produce sufficient traction unless a great tension is exerted by the operator, but by employing a rope and wrapping the same several times around the drum, as claimed by the said Thompson, a very slight tension upon the rope suffices to develop the friction required to lift a weight of many thousand pounds. As each turn of the rope

about the drum increases its friction therewith, it obviously increases the tendency to rub the rope and burn the same, and the application of mechanical means to grip and pull the rope secures the use of much greater traction than can be exerted by the operator's hand, and thus effects the lifting of the hammer with fewer turns of the rope about the drum. The tendency to rub and burn the rope is thus diminished in a corresponding degree.

The invention will be understood by reference to the annexed drawings, in which—

Figure 1 is a side elevation, and Fig. 2 a rear elevation of a drop press having grooved rolls to grip the rope. Fig. 3 is a section of the hammer and lifting devices on line *x, x*, in Fig. 4, with a part of the column in the rear of the same. Fig. 4 is a plan of the press with the parts at the left side of the center line removed above the line *z, z*, in Fig. 2.

A is the bed of the press, B the columns, C the hammer, D the force, and E the die upon the bed. A drum *d* is shown affixed to a shaft *a* mounted in bearings *b* in the tops of the columns, and driven by means of cog-wheels *c* and a pulley *e*, which is affixed to a pulley shaft *f* in bearings *f'* adjacent to the bearings *b*.

Two ropes *g* are shown attached to the hammer C and wound three times around the drum, with their free ends in contact with traction rolls *l, l'*. The rolls *l* are mounted in brackets *i* projected from the columns, and the rolls *l'* are mounted in movable bearings *n* upon bell-cranks *o* which are pivoted upon the columns. A treadle *t* is fixed to arms *j* which are pivoted upon the bed A, and the treadle arms are connected with the bell-crank *o* by rods *k*. The rolls are grooved to hold the rope in place, and to grip the same more effectively; and springs *m* are arranged to normally lift the treadle and thus retract the rolls *l'* from the ropes. Pulleys *p* are fixed to the shaft *f* and the spindle *s* which carries the rolls *l*, and are connected by a belt *r*. The drum *d* and the traction rolls *l* are continuously rotated by the pulley *e* in the direction of the arrows *e'*, and the pressure of the rolls upon the rope, when the treadle is depressed,

operates to pull the free end of the rope downward, as required to lift the hammer C. With this construction the operator may, by pressing upon the treadle, actuate the traction rolls and raise the hammer and force D to any desired height, and permit the same to fall by relaxing the pressure upon the treadle; the spring *m* then operating instantly to lift the treadle and retract the rolls *V*, which releases the ropes *g* and terminates the friction of the drum upon the rope. As such friction is necessary to sustain and lift the hammer, the hammer immediately falls, while the free ends of the ropes remain in the grooves of the traction rolls, in readiness to be gripped whenever the treadle is depressed. By the use of two ropes the friction necessary to lift a heavy hammer is secured without excessive winding of the ropes about the drum, and the diameter of rope necessary to lift a given load is also diminished, thus securing a greater flexibility in the rope and a greater freedom and rapidity of movement around the drum when the hammer falls.

The hammer is shown partly lifted in Figs. 1 and 2, and may obviously, with the lifting device shown, be raised to any desired height, and the traction upon the ropes released instantly to drop the hammer. The foot board of the treadle *t* is shown upon one side of the press in Fig. 1, and the ropes *g* upon the opposite side, thus placing the ropes *g* and their traction gearing entirely clear of the operator, who stands upon the side where the treadle is located.

It is common in drop presses to furnish a pawl to sustain the hammer when not in use, and also to furnish automatic devices for regulating the upward movement of the hammer and permitting it to fall uniformly from the same height; but these devices are not shown herein as they are already well known, and form no part of the present invention.

With the devices described, the operator's hands are entirely free to manipulate the machine, while all the advantages are secured which attend the use of a hammer raised by the friction of a rope upon a continuously rotating drum.

The operator may obviously, by gradually lengthening the pressure upon the treadle, produce a succession of graduated blows, and

is thus enabled by degrees to work the metal up into high relief.

The devices shown are adapted to raise hammers above one ton in weight, which have never heretofore been provided with automatic lifting apparatus that could produce a succession of graduated blows. Such heavy hammers, when used to stamp sheet metal in high relief, have heretofore been provided with a series of graduated dies or forces, and the metal has required successive treatments in the same press by changing the "forces" in succession, and stamping the metal repeatedly with such series of "forces," to raise the impression by a succession of operations.

By means of our improvement, a die or "force" of the highest relief can be used in the gentlest manner to draw the metal gradually into its finished shape, and the metal, at the close of the operation, be stamped with the heaviest blow, to finish it in the desired manner.

Having thus set forth our invention, what is claimed herein is—

1. In a power lifter for drop presses, the combination, with a hammer, and drum rotated continuously above the same, of a rope or strap attached to the hammer and extended over the drum, traction rolls arranged to grasp and pull the free end of the rope, a treadle for pressing the rolls upon the rope, and means, as a spring *m*, for separating the rolls when the treadle is released, substantially as herein set forth.

2. In a power lifter for drop presses, the combination, with a hammer and drum rotated continuously above the same, of a rope or strap attached to the hammer and extended over the drum, traction rolls grooved to fit the rope, a treadle for pressing the rolls upon the rope, means for separating the rolls automatically, and gearing, as the pulleys *P* and belt *R*, for rotating the traction rolls continuously, substantially as herein set forth.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

JAMES WHITE.

ANSON O. KITTREDGE.

Witnesses:

THOMAS S. CRANE,

JOSEPH M. STOUGHTON.