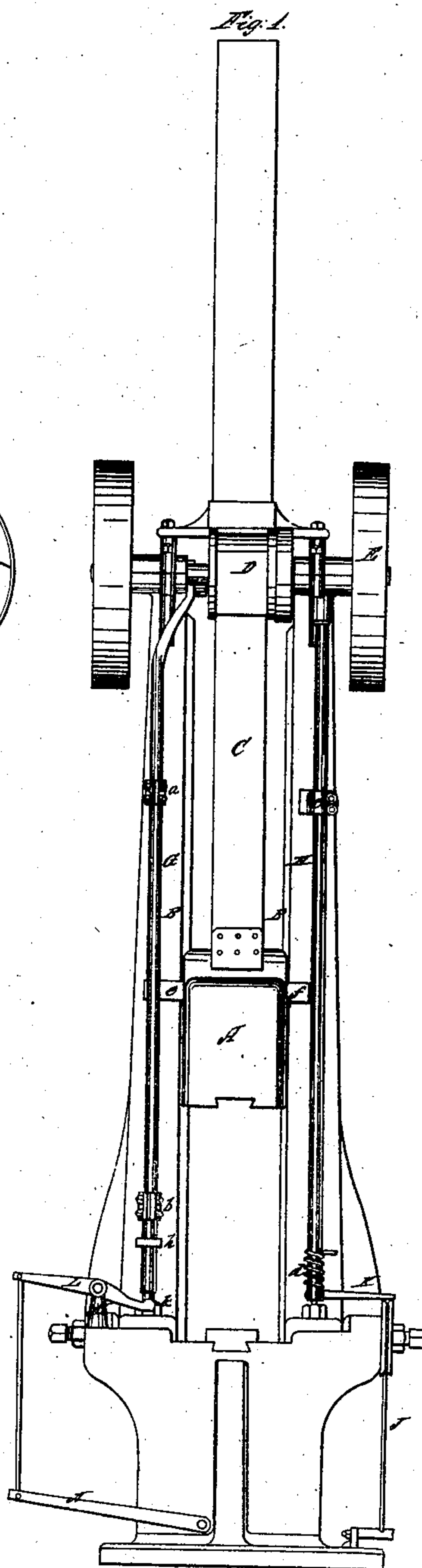
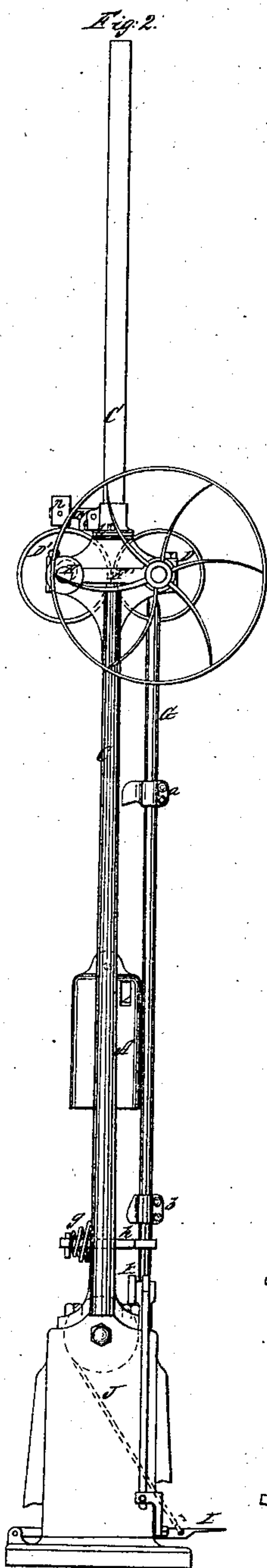
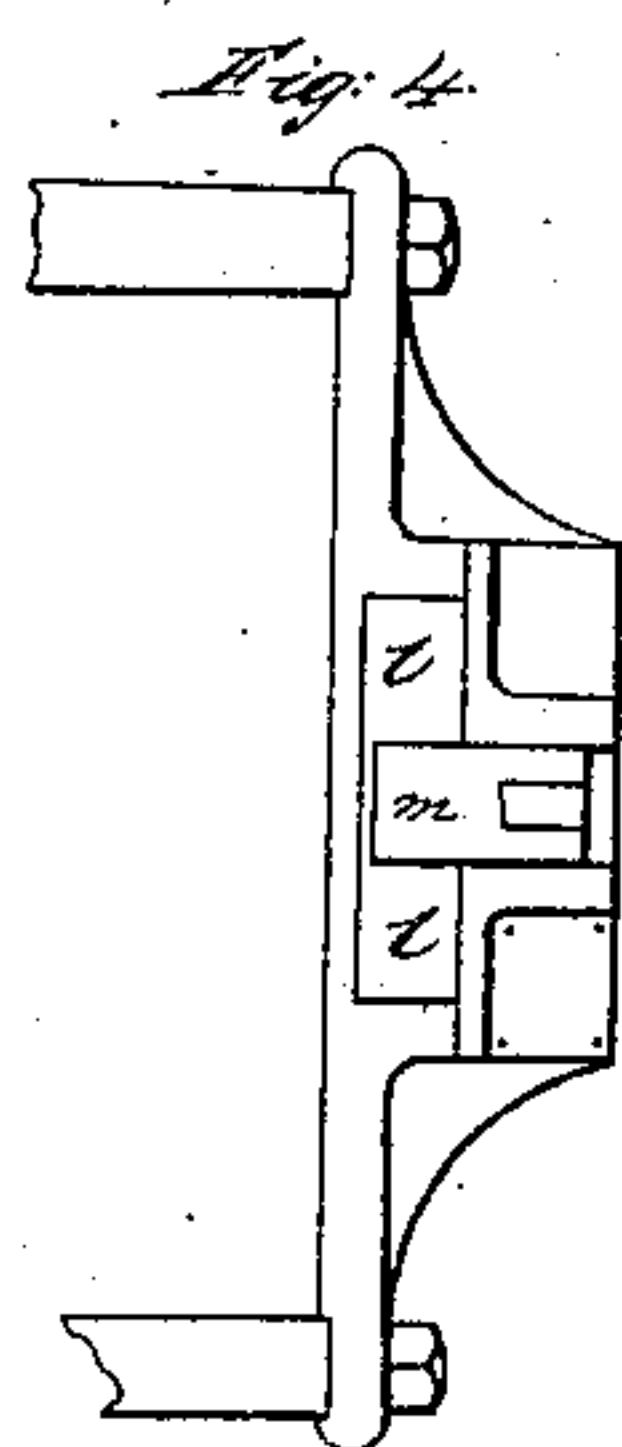
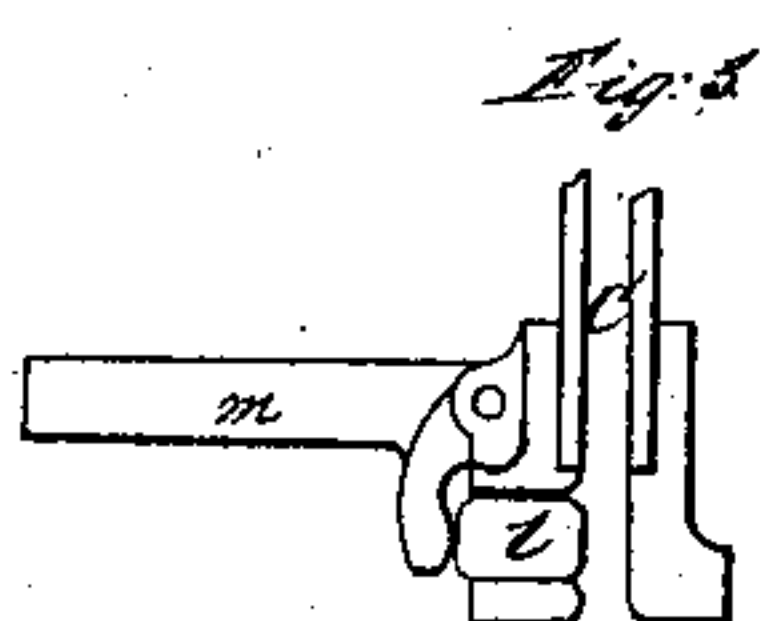


Goulding & Cheney, Drop Hammer,

N^o 36,459.

Patented Sep. 16, 1862.



W. Crosson:
J. H. Wells
Clarence Grant
John B. Pierce
L. H. H. H.

Inventors
Frank Cheney
W. H. Goulding

UNITED STATES PATENT OFFICE.

FRANK CHENEY, OF HARTFORD, CONNECTICUT, AND WILLIAM F. GOULDING, OF PROVIDENCE, RHODE ISLAND.

IMPROVEMENT IN DROP-PRESSES.

Specification forming part of Letters Patent No. 36,459, dated September 16, 1862.

To all whom it may concern:

Be it known that we, FRANK CHENEY, of Hartford, in the State of Connecticut, and WILLIAM F. GOULDING, of the city and county of Providence, in the State of Rhode Island, have invented a new and useful Improvement in Drop-Presses; and we do hereby declare that the following specification, taken in connection with the drawings making a part of the same, is a full, clear, and exact description thereof.

Figure 1 is a front view. Fig. 2 is a side view. Figs. 3 and 4 are detailed parts to be referred to hereinafter.

In the accompanying drawings, the drop weight or hammer A is fitted to work in guides on a gallows-frame, BB. It is raised by means of a straight strap, C, of leather, sheet metal, or other material possessing the requisite friction-surface to enable the lifting-pulley to act. This strap, which may be of any desired thickness and should possess no elasticity, passes between the faces of the two pulley-wheels D D'. These pulleys are provided with toothed gears, which are of the same size and fitted to engage with each other, and are thereby driven in opposite directions by the belt, which passes over the driving-pulley E, attached to the shaft to which pulley D is secured.

The pulley D' revolves upon a shaft, which, with reference to the bearing F, is set eccentrically, so that by raising the rod G, hinged to the arm F', which is keyed to the bearing F, the pulley D' will be moved away from the lifting-strap, against which at other times it presses. The rod G extends downward to near the foot of the frame and is provided with two adjustable sliding blocks, *a b*, the purpose of which will presently be understood.

Upon the side of the gallows-frame opposite to that where the rod G is placed there is a similar rod, H, which is capable of turning axially in suitable bearings. It is provided with an adjustable block, *c*, and also with a coiled spring, *d*, the latter being for the purpose of retaining the rod, with its attachments, in the proper relative position.

Projecting from each side of the drop-weight are the wedge-formed ears *e* and *f*, the office of which is to operate the adjustable stops *a b c*,

above referred to. Suppose, now, the pulley E to be revolving, the operation of the drop will be as follows: By the friction of the drums D and D' upon the strap C the weight A is carried upward until it reaches the point where the stop *c* is placed. The inclined face of *f* strikes against a corresponding inclination on the lower face of the stop *c*, whereby the rod H is turned in its bearings far enough to permit the ear to pass. The coiled spring *d* instantly returns the rod to its former position, so that the hammer upon its return will be sustained by the base of the wedge *f* resting on the upper surface of the stop *c*. The ear *e* on the opposite side should strike against the stop *a* as soon as the projecting ear *f* has fairly passed the stop *c* and raise the rod G high enough to act upon the arm F', and thereby move the drum D' so far from the drum D as to destroy the friction upon the strap C. The weight A will then descend until it is arrested, as before stated, by the stop *c*.

When it is desired to trip the weight, the operator depresses with his foot the treadle I; which, through the chain J and lever K, operates the rod H and removes the support to the weight.

In order to keep the drum D' from pressing against the lifting-strap until after the hammer has given its blow, and also to insure the ascent of the hammer the instant that the blow has been struck, the following arrangement has been employed. When the rod G is raised by the weight in ascending, the spring *g*, Fig. 2, acting on the link *h*, pulls the foot of the rod G toward the frame, so that when it would otherwise be permitted to return it will rest on a projecting shelf or short standard, *k*. The drum D' is thus prevented from acting on the strap C and impeding the free descent of the hammer whenever the foot-treadle is depressed. As, however, the hammer reaches the anvil, the projecting ear *e*, having its inclined face turned downward, comes in contact with the inclined face of the stop *b* and pushes the foot of the rod G from its supporting-shelf. The drum D' is then brought again to act on the strap C, and the hammer is at once raised to its former elevation.

Inasmuch as the strap C would, if there

were no means taken to prevent it, be liable to hang slack when the hammer was down, and thus increase the probability that the hammer would rebound upon the work, a friction-block, *l*, Fig. 3, is placed against the strap *C*, over the cross-head of the gallows-frame. The degree of friction which this block should exert in order to keep the strap at all times from bellying is regulated by the bell-crank lever *m*, upon the long arm of which is the weight *n*, by which the degree of pressure can be easily regulated.

It will be observed that the improvements described secure the following advantages, which render this machine superior to all others of its class heretofore known. The straight strap admits of any degree of strength which may be required, from the fact that a number of thicknesses of sole-leather, or strips of leather and sheet metal combined, may be used for the strap when made in this form, while it would be impossible to use the same thickness of leather or the same combination of materials in the form of a belt to be wound around a pulley. The friction block *l*, with its controlling lever *m*, is a cheap and effectual means for preventing the strap from becoming slack, while the adjustable blocks *a* *b* *c* admit of the ready adjustment of the height from which the hammer is to fall at the same time that they insure a free descent to the hammer in falling, and an immediate ascent to its proper elevation the instant that the blow has been struck.

In the majority of the kinds of work for which these presses are employed it is desired to have the hammer fall from a fixed point.

In some instances, however, it may be advantageous to give a succession of blows of varying force. A means for doing this is exhibited in Fig. 1, consisting of a lever, *L*, pivoted to the fulcrum-standard *M*, and so arranged that when the treadle *N* is depressed the short arm of the lever will raise the rod *G* and permit the hammer to fall (unless it has passed the supporting-stop *c*) from the elevation at which it happens to be.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination of a strap, *C*, either flexible or otherwise, (as distinguished from a belt,) or its equivalent, in combination with a pair of friction-pulleys, *D* *D'*, substantially as described, for the purposes specified.

2. The combination of a friction-drag, *m* *l*, with the strap *C*, or its equivalent, substantially as described.

3. The combination of the adjustable supporting-stop *b* and the hammer *A*, substantially as described.

4. The combination and arrangement of the hammer *A* with both the adjustable stops *a* and *b*, when the latter are combined with each other to arrest the further ascent of the hammer and to sustain it at any given point, substantially as described.

FRANK CHENEY.
WM. F. GOULDING.

Witnesses:

JOHN H. WELLIS,
CLARENCE GRAVES,
BENJ. F. THURSTON,
JOHN B. PEIRCE.