

C. G. CROSS.
Drop-Hammer Lifter.

No. 228,324.

Patented June 1, 1880.

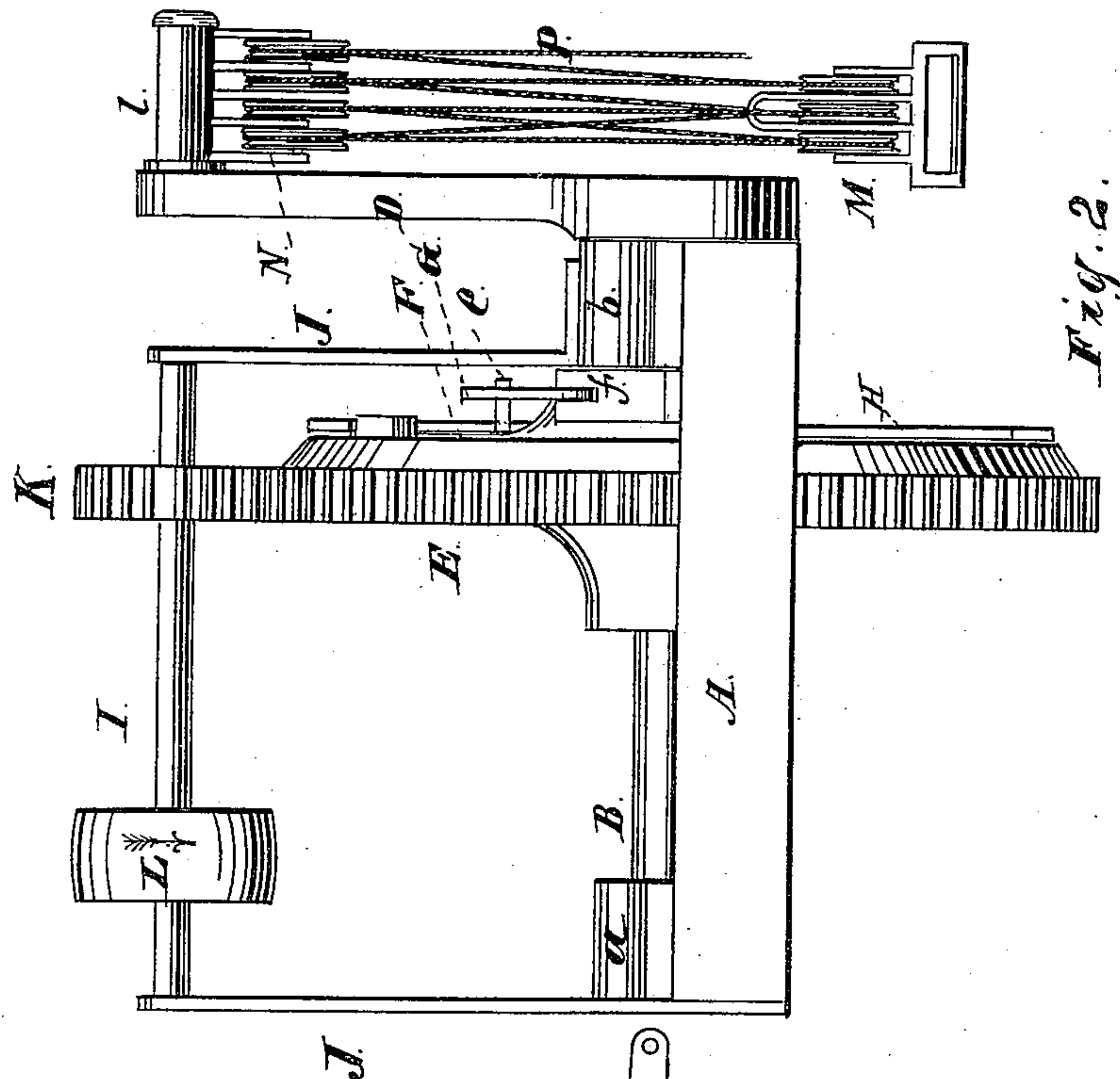


Fig. 2.

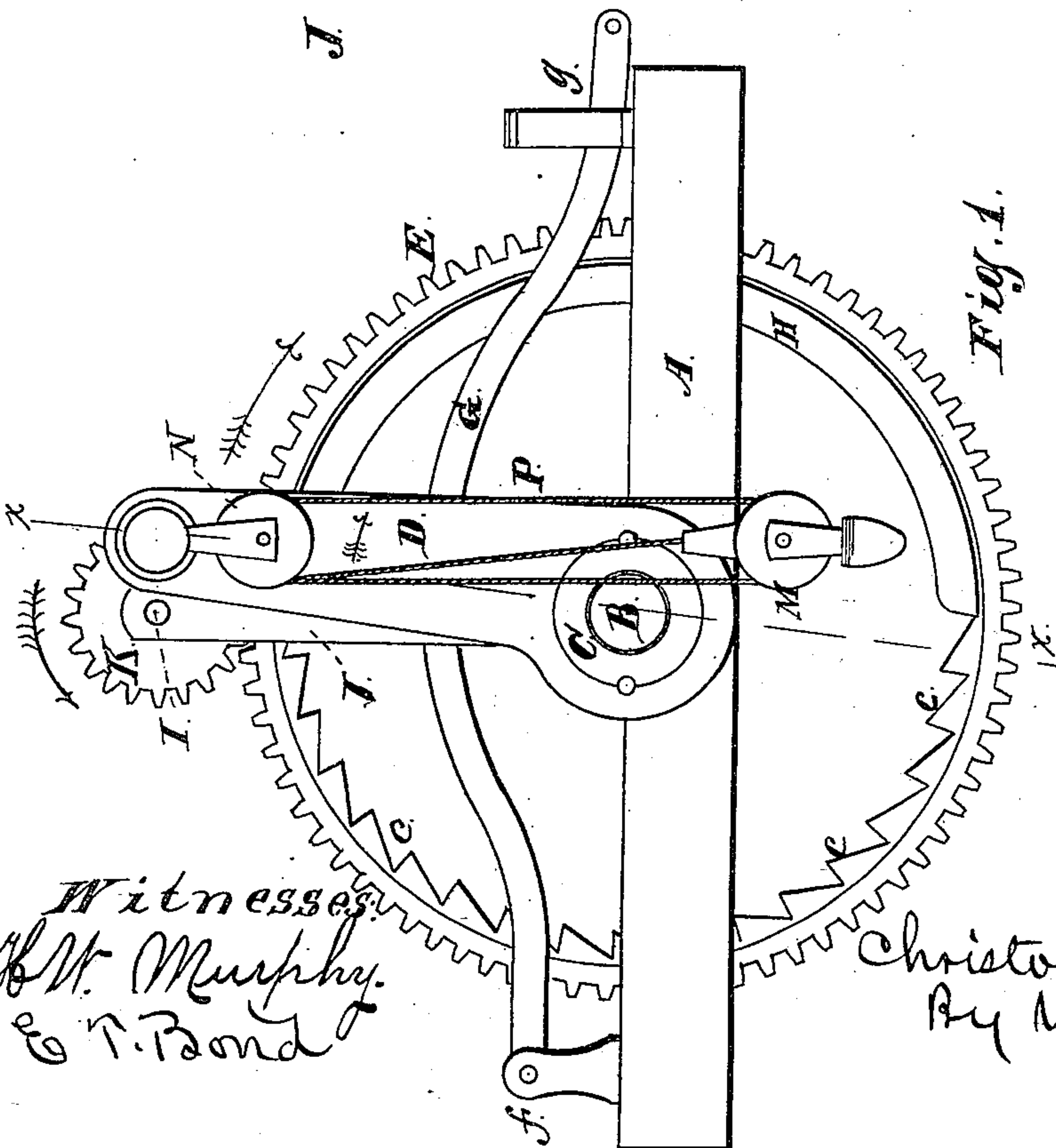


Fig. 1.

Witnesses:
H. M. Murphy.
E. T. Bond.

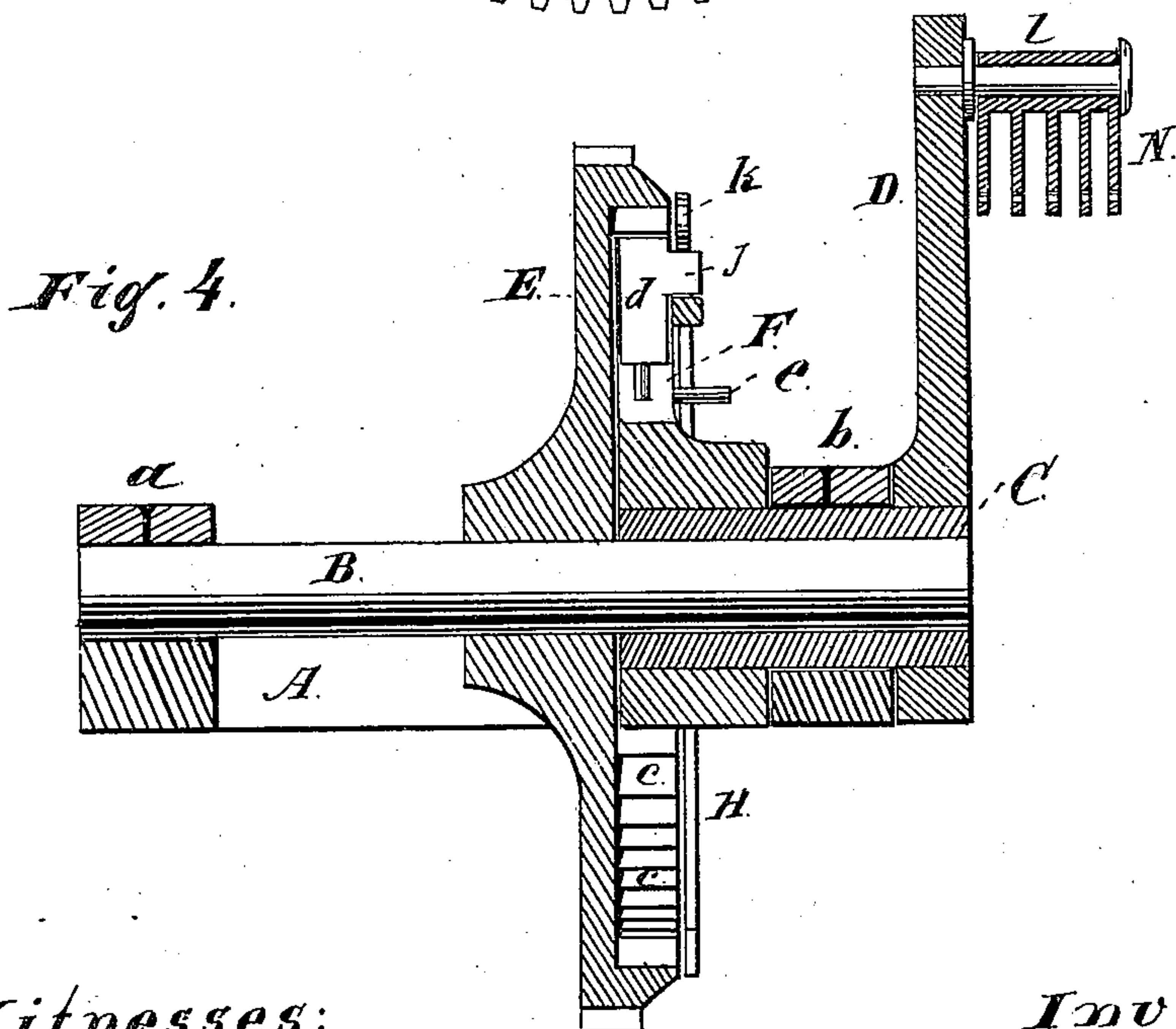
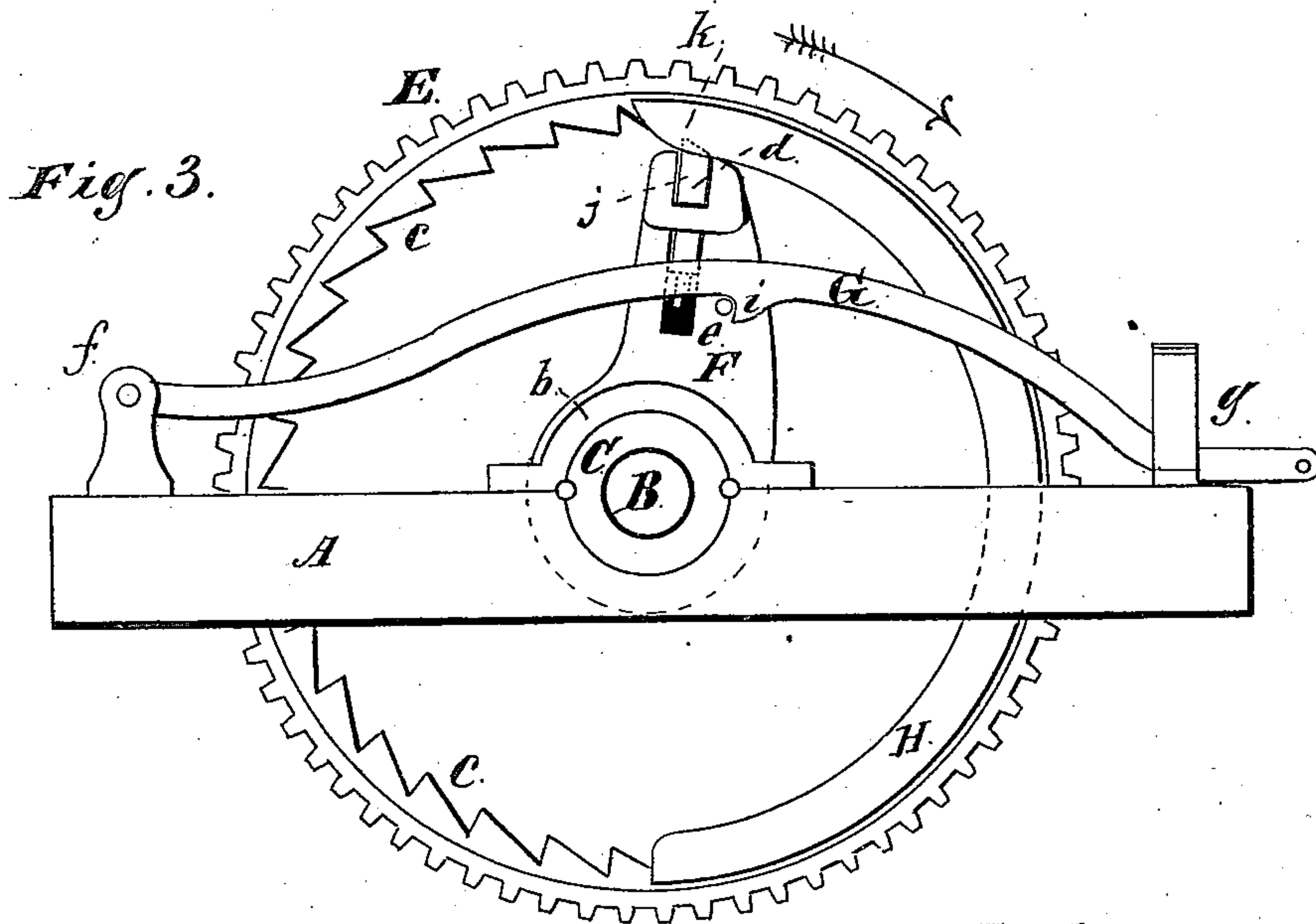
Inventor:

Christopher G. Cross.
By West & Bond.
His Atty.

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UNITED STATES PATENT OFFICE.

CHRISTOPHER G. CROSS, OF CHICAGO, ASSIGNOR TO WILLIAMS, WHITE & CO., OF MOLINE, ILLINOIS.

DROP-HAMMER LIFTER.

SPECIFICATION forming part of Letters Patent No. 228,324, dated June 1, 1880.

Application filed December 26, 1879.

To all whom it may concern:

Be it known that I, CHRISTOPHER G. CROSS, residing at Chicago, in the county of Cook and State of Illinois, and a citizen of the United States, have invented new and useful Improvements in Drop-Hammer Lifters, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation. Fig. 2 is a side elevation. Fig. 3 is a front elevation, the crank and parts connected therewith having been removed. Fig. 4 is a vertical section of the parts shown therein, taken at line *xx* of Fig. 1.

My improvement relates to that class of drop presses or hammers in which the weight is raised by means of a crank; and it consists in improved devices for raising the weight or hammer and in the means employed to suspend and adjust the weight, as hereinafter set forth.

In the drawings, A represents a frame in which the lifting devices are supported, which frame may be constructed in any suitable manner. B is a shaft, supported at one end in a bearing, *a*. The front end of this shaft projects beyond the frame A. C is a sleeve on or around the shaft B, which sleeve rotates in a bearing, *b*, while the shaft B also rotates in this sleeve, and the sleeve rotates on the shaft, the sleeve and shaft moving independently of each other. D is a crank secured to the outer end of the sleeve C. This crank carries the weight. E is a gear-wheel secured to the shaft B. This wheel E is provided with internal teeth, *c*. F is an arm permanently secured to the inner end of the sleeve C, and moving on the inside of the wheel E. *d* is a sliding catch suitably arranged in the outer end of the arm F, so arranged that it can engage with and be disengaged from the teeth *c*, upon the inside of the wheel E. *e* is a pin projecting from the face of the arm F. G is a bar hinged at the end *f* to the frame or a post thereon. It is provided with a projection, *i*, to engage with the pin *e*. The end *g* of the bar G has a limited vertical movement, so that the projection *i* can be released from the pin *e*.

H is a shield, which prevents the catch *d* from touching the teeth upon the right-hand

side of the wheel E, in front of which the shield H is secured. The upper end of this shield is curved. There is a projection, *j*, on the catch *d*, arranged so as to come in contact with the curved end *k* of the shield.

I is a shaft supported in bearings at the upper ends of the standards J, which are connected with the frame in any convenient manner. K is a small gear-wheel secured upon the shaft I and engaging with the wheel E. L is a pulley on the shaft I, and is designed to revolve in the direction indicated by the arrow. The wheel E and the crank D, with the arm F, move in the direction indicated by arrows, but opposite to the direction in which the wheel K moves.

The weight is not shown in the drawings, but it is to be suspended from the pulley-block M. N is another pulley-block, having a sleeve, *l*, connected therewith, in which the wrist of the crank revolves. P is the tackle, by means of which the position of the weight can be adjusted, as may be necessary when dies of different thicknesses are used or when the position of the crank-pin is changed.

I have shown six pulleys; but a greater or less number may be used.

The crank-pin can be adjusted in different positions, according to the required length of stroke, holes being provided in the web of the crank.

Suitable devices for raising the bar G are to be used, being connected to the end *g* of the bar G in any suitable manner.

The operation is as follows: The shaft I, with the wheel K thereon, is to be in constant motion, giving to the wheel E and its shaft B the same constant motion. In the drawings, the lifting-crank D and parts connected or used therewith are in the position which they occupy when the weight is raised, the same being prevented from falling by the engagement of the pin *e* with the projection *i* on the bar G, the crank having been carried a little beyond the center, as shown in Fig. 1. If, now, the tripping-bar G be released from the pin *e*, the weight will immediately fall, carrying the crank-arm F and catch *d* to their lowest point, the crank and arm F being secured to the sleeve C, which is free to rotate on the

shaft B. At this moment the catch *d* will have passed from the lower end of the shield H, and, by gravity, will fall and engage with one of the teeth *c* upon the inside of the wheel E, and the catch, with the arm F and crank D, said arm and crank being connected with the sleeve C, will be carried around with the wheel E until the catch is disengaged from the teeth *c*, either by gravity or by coming in contact with the curved end *k* of the shield H, and the pin *e* on the arm F engages with the projection *i* on the bar G. Then the weight will have been raised ready for the next blow, which will be given whenever the operator again releases the bar or tripping device G from the pin *e*. While the weight and lifting-crank remain at rest the wheel E will continue to revolve. The catch *d* falls and engages with the teeth *c* in the wheel E, and is disengaged therefrom by gravity.

The pulleys and tackle furnish a convenient means of suspending the weight from the crank-pin and of adjusting the same as the conditions may require. This connection is yielding, which is an important feature in use, for the purpose of relieving the parts from the

shock and strain which would follow if a rigid connection should be adopted.

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. A shaft, B, and a gear-wheel, E, provided with internal teeth, *c*, in combination with a crank, D, which carries the weight, and an arm, F, carrying a catch to engage with such teeth, such crank and arm being secured to a sleeve, C, upon and rotating independently of the shaft B, substantially as and for the purposes set forth.

2. A shaft, B, and a gear-wheel, E, provided with internal teeth, *c*, in combination with a crank, D, arm F, catch *d*, sleeve C, and devices for arresting the movement of the crank and releasing the same, substantially as and for the purposes specified.

3. In a drop-hammer lifter, the combination of two pulley-blocks, sleeve *l*, tackle P, and crank D, substantially as and for the purpose set forth.

CHRISTOPHER G. CROSS.

Witnesses:

E. A. WEST,

O. W. BOND.