2 Sheets--Sheet 1.

L. CHAPMAN.

Drop-Hammers.

No. 149,277. Patented March 31, 1874.

Fig. 1

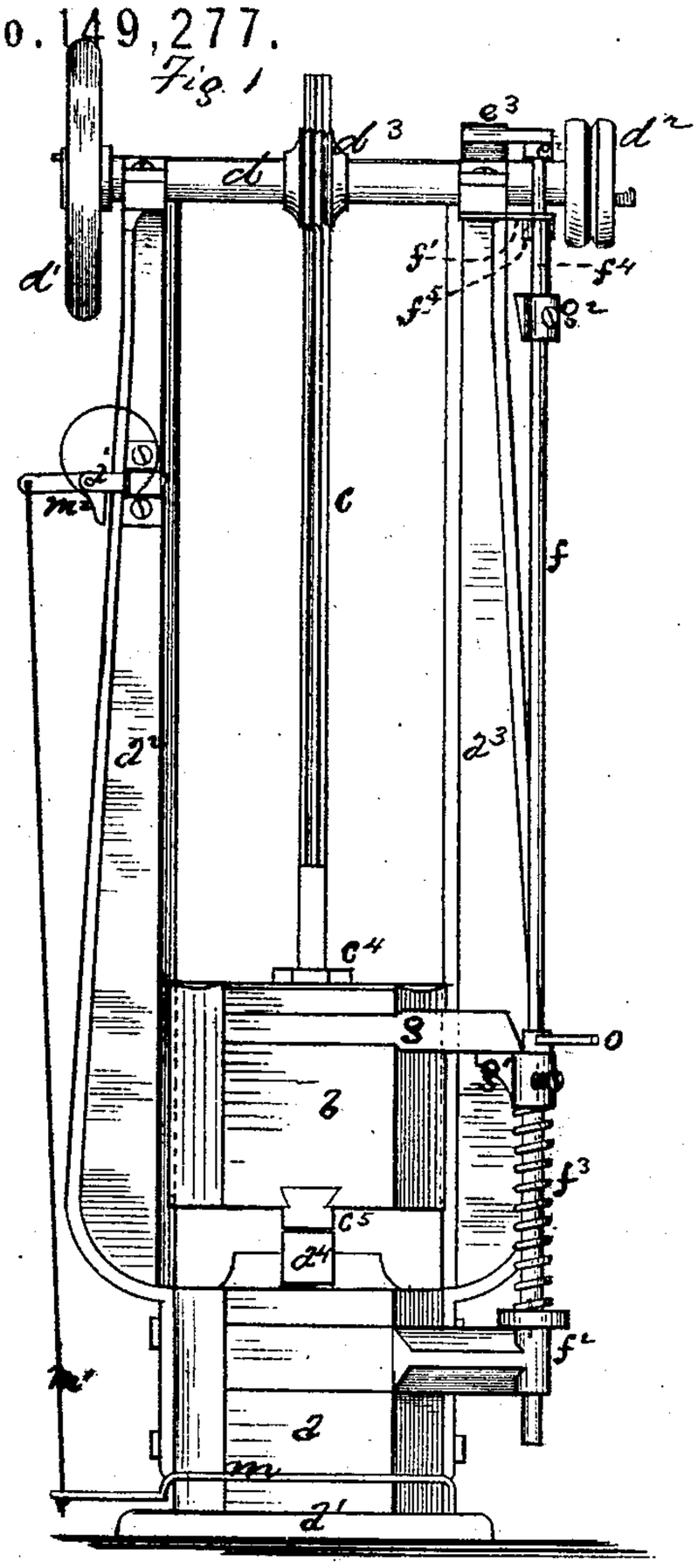


Fig. 2

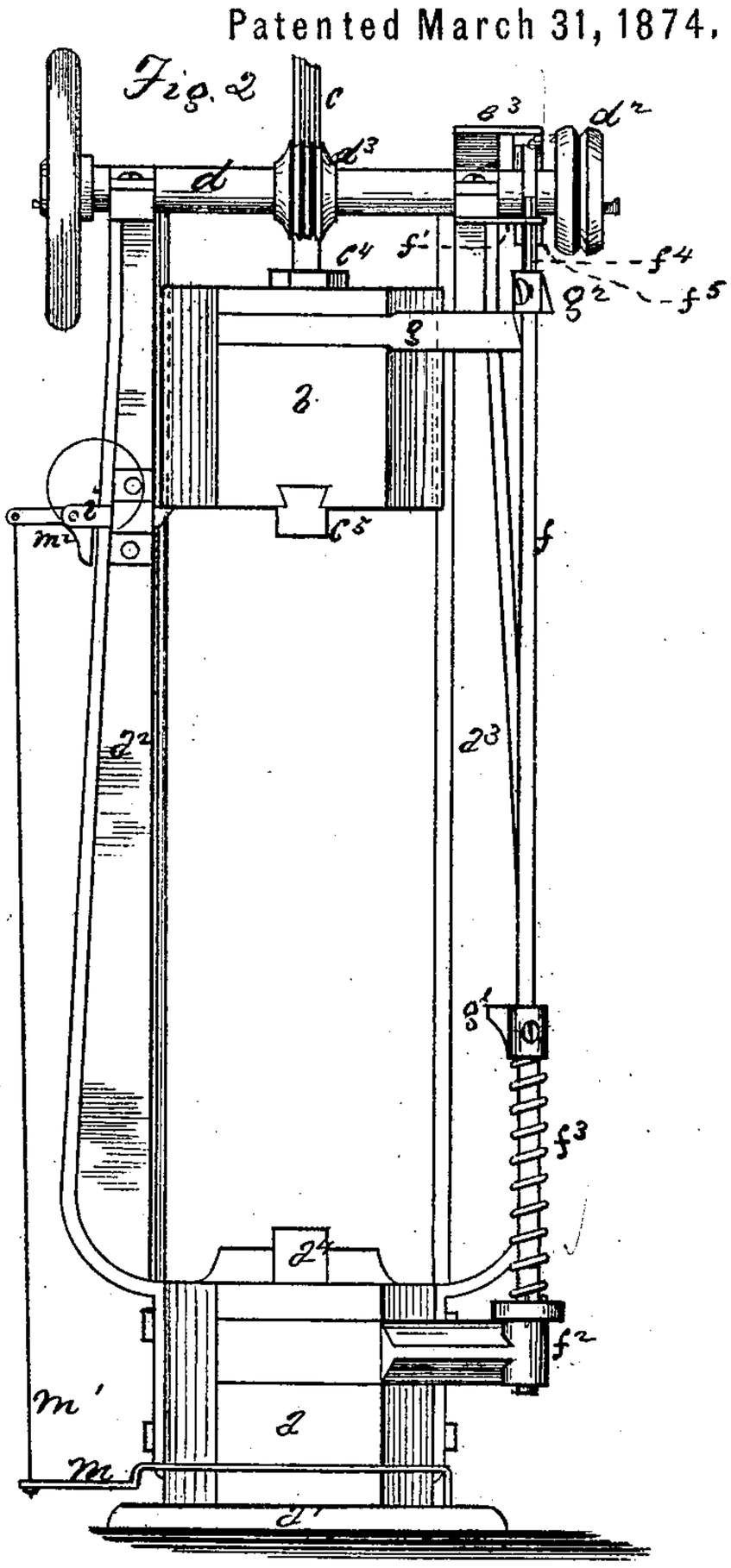
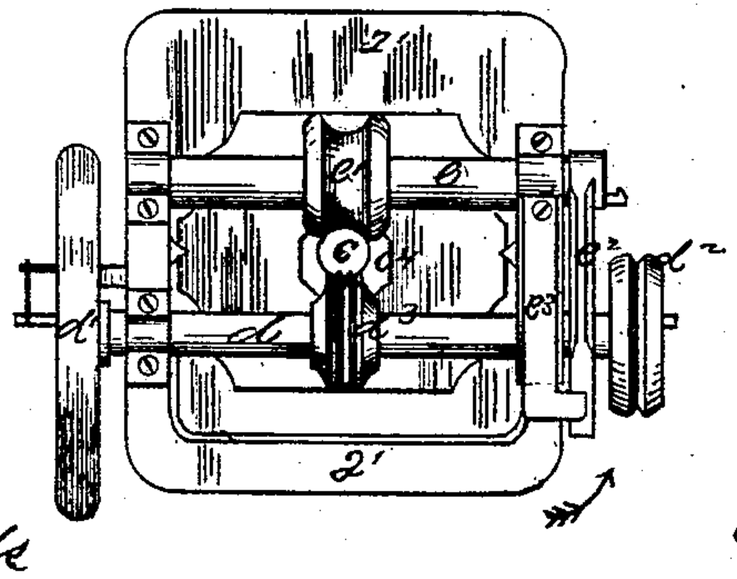


Fig 6



WITNESSES.

S. S. Simonds

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Luke Chapman

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2 Sheets--Sheet 2.

L. CHAPMAN.

Drop-Hammers.

No. 149,277. Patented March 31, 1874.

Fig 3.

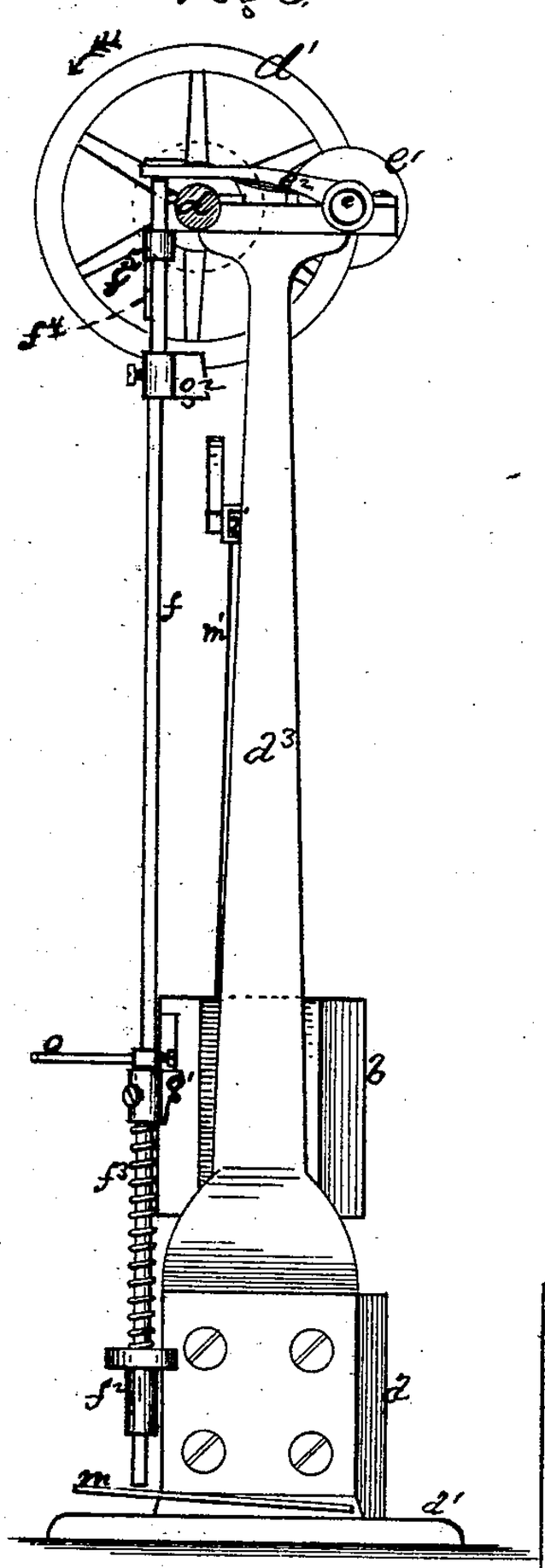


Fig. 4

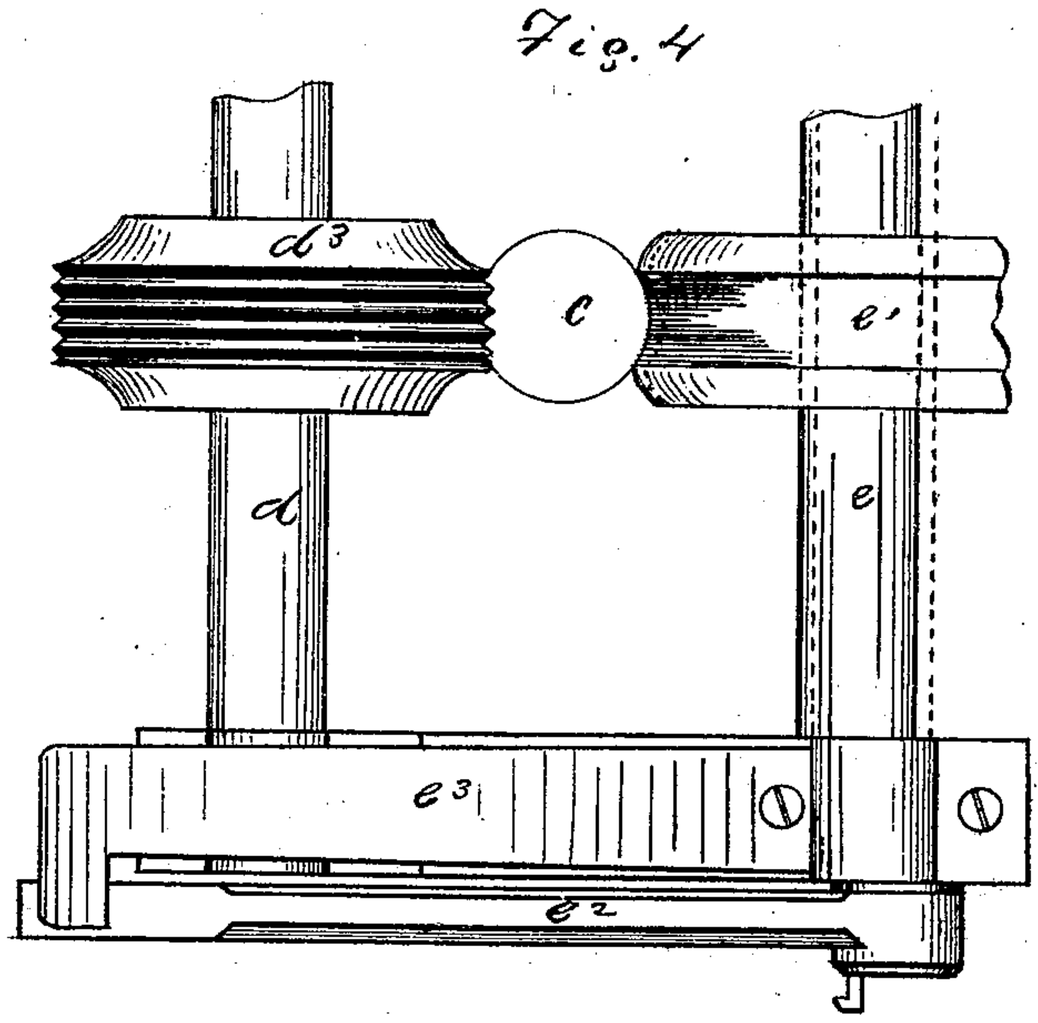
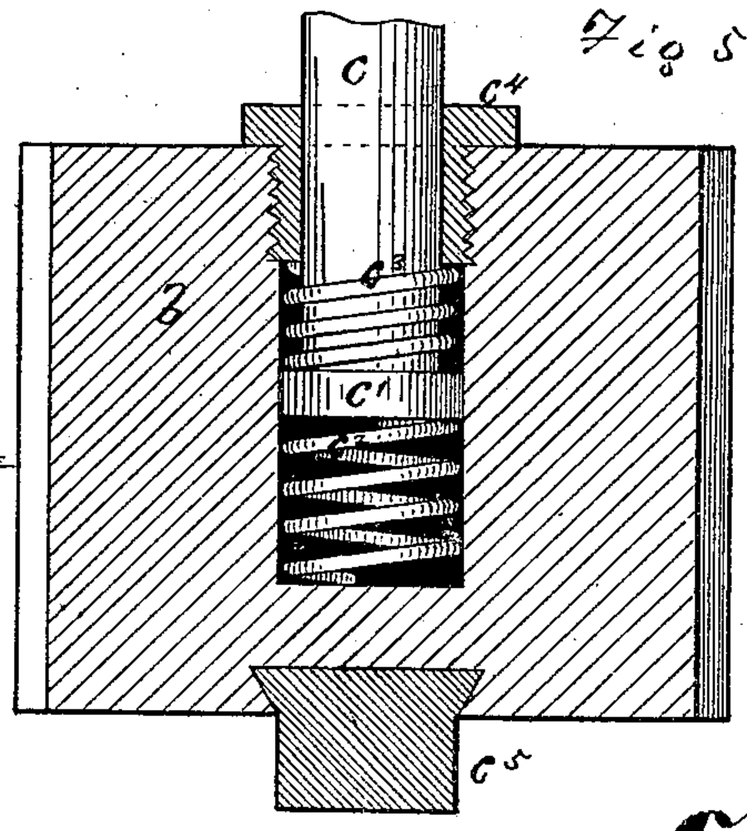


Fig 5



WITNESSES.

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INVENTOR.

Luke Chapman.

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Atty.

UNITED STATES PATENT OFFICE.

LUKE CHAPMAN, OF COLLINSVILLE, CONNECTICUT, ASSIGNOR OF ONE-HALF HIS RIGHT TO WILLIAM J. WOOD, OF SAME PLACE.

IMPROVEMENT IN DROP-HAMMERS.

Specification forming part of Letters Patent No. **149,277,** dated March 31, 1874; application filed February 7, 1873.

To all whom it may concern:

Be it known that I, LUKE CHAPMAN, of Collinsville, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Drops or Stamping-Machines, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation of my improved drop, with the weight down upon the anvil. Fig. 2 is a front elevation of the same, with the weight elevated for a stroke. Fig. 3 is an elevation of the right side of the drop, with the weight down. Fig. 4 is an enlarged detached view of the friction-wheels made use of, and the adjacent mechanism. Fig. 5 is a view of the weight in transverse vertical section through the center of the weight. Fig. 6 is a top view of the drop.

The letter *a* indicates the anvil-block sitting upon the foot a^1, with the standards a^2 a^3 rising therefrom. a^4 is the anvil set in the anvil-block. *b* is the weight moving up and down on ways on the inner sides of the standards a^2 a^3. The weight is pulled up by means of the rod *c*, which has an elastic attachment to the weight, as follows: On the lower end of the rod *c* is a collar or flange, c^1, just fitting in a circular hole made in the top of the weight. Under the end of the rod is placed a spring or packing, c^2, and above the collar, and encircling the rod, is placed the spring or packing c^3, bearing against the nut c^4, which screws into the round hole in the weight, and through which runs the rod. This arrangement prevents the concussion of the weight from breaking or bending the lifting-rod. The letter c^5 indicates the striking-face of the weight. On the top of the standards is hung the rotary shaft *d*, on which is the balance-wheel d^1 and the pulley d^2, by which power is communicated to the drop. This shaft turns constantly in the direction indicated by the arrow. On this shaft is the friction-wheel d^3, the face of which is, by preference, corrugated, as shown in the drawings. If corrugated, the lifting-bar *c* is also correspondingly corrugated. On the top of the standards is also hung the cam-shaft *e*, having upon it the loose pulley e^1, having its face grooved out to fit against the lifting-bar *c*. To the cam-shaft *e* is attached the arm e^2. When the end of this arm or rocking lever e^2 is depressed a little from the position shown in Fig. 3, the body of the cam-shaft will be thrown forward, so that the loose pulley e^1 will press the lifting-rod *c* tightly between the corrugated pulley d^3 and itself, and, as the friction-pulley d^3 is turning, it will run the lifting-rod upward, and so raise the weight.

I will now describe how the pulley e^1 is thrown forward so as to cause the lifting of the weight, and how, at the proper time, the cam-shaft is again rocked backward, so as to cause the upward movement of the rod *c* to stop.

The letter *f* indicates what I will call the "mesh-rod," having a short up-and-down movement in the sockets f^1 and f^2. It also has a short rotary play. f^3 is a spring tending to push the mesh-rod upward, and also to turn it around in the direction indicated by the arrow in Fig. 6. On the mesh-rod is a feather f^4, and in the socket f^1 is a spline-slot extending straight toward the front, through which the feather will slide upward when the mesh-rod is turned, so that the feather will extend toward the front, and thus correspond in position with the spline-slot. When the rod *f* is depressed and turned in any other position, the upper end of the feather will lock under the socket f^1 and prevent the mesh-rod from springing upward. Just under the socket f^1 is a stop, f^5, which prevents the feather from turning sidewise any farther than is sufficient to allow the feather to lock under the socket. A spring e^3 presses the arm e^2 downward with force sufficient to make the pulley e^1 press upon the rod *c* and raise the weight. The spring f^3 is strong enough to overcome the force of the spring e^3, and when the rod *f* rises it pushes up against the arm e^2, and thus throws the pulley e^1 out of mesh, so that it will lose its hold on the rod *c*.

When the weight *b* falls, just before it strikes on the anvil, the arm *g*, projecting from the weight, strikes upon the finger g^1 projecting from the mesh-rod, thus pulling the mesh-rod down till the upper end of the feather f^4 comes below the socket f^1, when the spring f^3 will throw the feather around sidewise against the stop f^5, thus locking the mesh-rod from an upward movement. The spring e^3 now comes into play, pressing down the arm e^2 and throwing the loose pulley e^1, rod *c*, and friction-pulley

d^3 into mesh, thus causing the rod c and weight to rise. At the proper time the arm g strikes upon the finger g^2, throwing the mesh-rod around so as to bring the feather f^4 under the spline-slot in the socket f^1, when the spring f^3 will push the mesh rod upward, and thus raise the end of the rock-lever e^2, so as to throw the loose pulley e^1 out of mesh, causing the upward movement of the weight to cease. It will be observed that this unmeshing movement is sudden and almost instantaneous. There is a spring-catch, i, attached to the standard a^2, upon which catches and rests the weight when its upward movement ceases. The weight is released when a stroke is desired by the operator pressing his foot upon the treadle m, which is connected, by the link m^1, to the cam-lever m^2, which is pivoted to the outer end of the spring-catch i. This pulls the catch outward, releasing the weight and giving a stroke, the weight being again elevated, as before.

The distance to which the weight is elevated is regulated by the elevation of the finger g^2 and the catch i. If the operator desires, for any reason, to give a short stroke of the weight, he can release the weight at any time during its upward movement by taking hold of the handle o and bringing the feather f^4 under the spline-slot in the socket f^1.

All that part of this drop which is set upon the top of the standards, commonly called the "lifter," can be detached from the standards and set upon overhead beams, as is often done in other drops.

I claim as my invention—

1. The combination of the socket f^1, having the spline-slot and the stop f^5 just underneath, the mesh-rod f, having the feather f^4 and the spring f^3, the cam-shaft e, loose pulley e^1, rock-lever e^2, spring e^3, shaft d, friction-pulley d^3, and lift-rod c, the whole constructed, arranged, and designed for operation and use, substantially as described.

2. The combination of the socket f^1, having the spline-slot and the stop f^5 just underneath, the mesh-rod f, having the feather f^4 and the spring f^3, the fingers g^1 g^2, and the arm g projecting from the weight, all substantially as described.

LUKE CHAPMAN.

Witnesses:

OLIVER F. PERRY,

ALBERT L. THAYER.