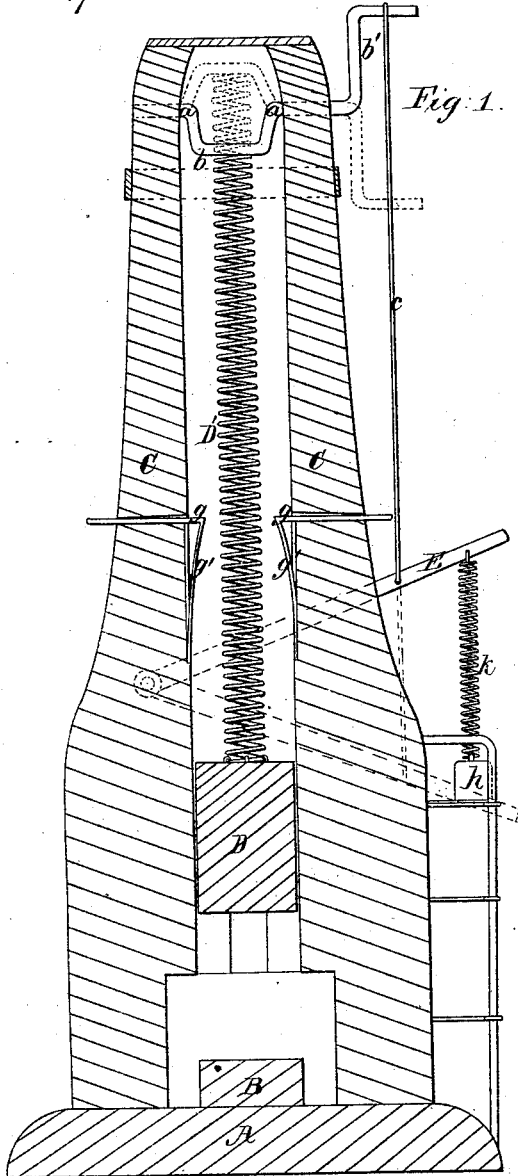


*E. F. McFarland,*

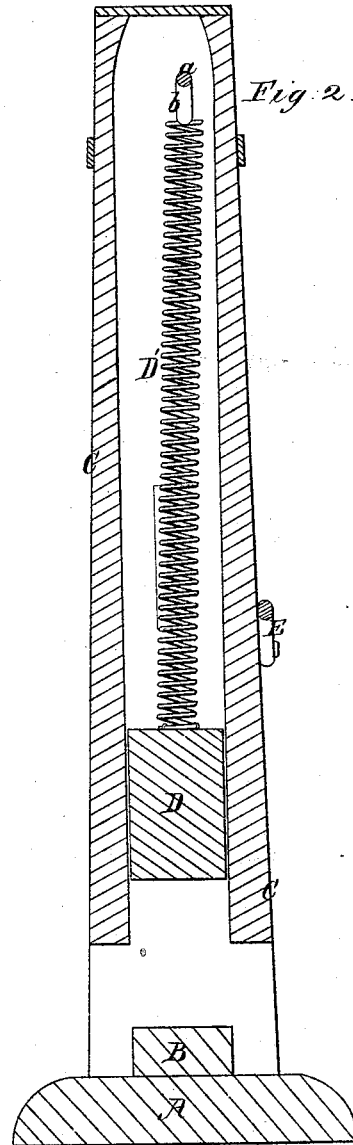
*Oliver,*

*N<sup>o</sup> 45,928.*

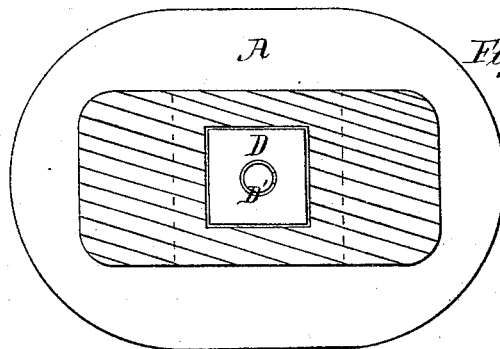
*Patented Jan. 17, 1865.*



*Fig. 1.*



*Fig. 2.*



*Fig. 3.*

*Witnesses;  
Edw. J. McFarland  
R. L. Campbell*

*Inventor,  
Edw. J. McFarland  
by his atty,  
Mason, Remond & Co.*

# UNITED STATES PATENT OFFICE.

EDWARD F. McFARLAND, OF WORCESTER, MASSACHUSETTS.

## FORGING APPARATUS.

Specification forming part of Letters Patent No. 45,928, dated January 17, 1865.

*To all whom it may concern:*

Be it known that I, EDWARD F. McFARLAND, of Worcester, county of Worcester, State of Massachusetts, have invented an Improvement in Forge-Hammers or Stamping-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a vertical section through the frame-work which supports the hammer, showing the contrivances for operating it. Fig. 2 is a horizontal section through Fig. 1. Fig. 3 is a cross-section through Fig. 1.

Similar letters of reference indicate corresponding parts in the three figures.

This invention relates to an improvement in operating hammers for forging or other purposes; and it consists in suspending a hammer by means of a spiral spring-stem which is connected to a lever in such manner that the resiliency of the spring, together with the rebound of the hammer after each blow, will assist in elevating the hammer to the proper height to give the required momentum to it in the downward stroke, as will be hereinafter described.

Another object of my invention is to relieve the hammer-stem from the weight of the hammer when the latter is not in immediate use, for the purpose of preventing injury to the spring-stem, substantially as will be hereinafter described.

To enable others skilled in the art to make and use my invention, I will describe its construction and operation.

In the accompanying drawings I have represented the hammer arranged within a frame-work which consists of two upright guides, erected upon a solid foundation, A, upon which the anvil B is supported. The guides C C are grooved to receive the hammer D, and to allow this hammer to rise and fall through a sufficient space to give it the required impact. If desirable, the frame may be constructed in any other manner which will adapt it to serve as guides for allowing the hammer to rise and fall vertically. At or near the upper end of the frame C C is a horizontal crank-shaft, a, having a crank, b, formed on fit within the space left between the guides C C, and also a crank, b', formed

on that end which projects beyond the frame, as shown in Fig. 1. To the inner crank, b, I attach the hammer-stem D' in any suitable manner, and to the outer crank, b', I attach a rod, c, which projects downward and is connected to a vibrating lever, E, which is located near the base of the machine. The hammer-stem D' consists of a spiral spring, which is made of sufficient strength to sustain the weight of the hammer, and of sufficient length to allow the hammer to strike the anvil with considerable force when the hammer falls from its highest point. It is also intended that the hammer D shall extend the spring-stem D' in its downward stroke, so that the retraction of the spring will operate to assist in elevating the hammer again to the desired height; but it is not expected that the spring-stem, in its recoil, will elevate the hammer to the height from which it started, for during this recoil of said stem an upward impetus is given to the hammer by a person standing near the machine and actuating the lever E, which impetus will raise the hammer to the proper height.

By my invention the operator elevates the stem and the hammer together, and then allows them both to descend together. This movement being repeated several times, the spring-stem begins to act with full force upon its hammer in the upward stroke, and as provision is made for taking advantage of the resiliency of the spring, the operator can keep the hammer in motion and cause it to strike the anvil at every downward stroke by giving a very slight but quick movement to the lever E at the moment the hammer commences its upward stroke and then suddenly releasing this lever again at the moment the hammer commences to descend.

It will be seen that by properly regulating the length of the spring-stem the operator can, at any moment, prevent the hammer from striking the anvil, or he can regulate the force of the blow by depressing the lever E more or less during the descent of the hammer. It will also be seen that the jar and concussion caused by the hammer striking the anvil will not be communicated to the mechanism for operating the hammer-stem, for the reason that this stem is the only connection between the hammer and said mechanism, and and it will not transmit the jar.

To prevent injury to the hammer-stem when the former is not in immediate use, I employ two shelves, *g g*, arranged at such a height from the anvil as will sustain the hammer above the tension-point of the spring-stem, and thus relieve this stem of its load. These shelves *g g* are acted upon by springs *g' g'*, which keep them in a position to receive the hammer at all times, and as the latter is moved up to be supported upon the shelves they spring back and receive it upon them. By withdrawing the shelves *g g* the hammer will fall, and may be acted upon by the lever *E*, as above described.

In Fig. 1 I have represented a weight, *h*, suspended from the long arm of lever *E* by means of a spring, *k*. The object of employing this weight is to assist the operator in working a very heavy hammer, it serving to counteract or counterbalance the weight of the hammer. The spring *k*, by its resiliency, will assist the operator in lifting the weight *h*.

If desirable, the crank-shaft *a*, from which the hammer *D* is suspended, may be operated by steam or horse power, acting upon it through the medium of well-known machinery.

In the above description I have referred particularly to a hammer for forging purposes;

but it will be seen that without changing the principle of my invention it may be applied for operating stampers or other contrivances which are required to move very rapidly through a short space and to strike with considerable force.

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

1. Constructing the stem *D'* of a hammer, *D*, of a spring which is attached at its upper end to a crank-shaft, *a*, substantially as described.

2. The combination of a hammer, *D*, spring-stem *D'*, crank shaft *a*, and lever *E*, operating substantially as described.

3. The use of shelves *g g*, adapted to support the hammer *D* when not in use, substantially as described.

4. The application of a counter-weight, *h*, which is suspended by a spring, *k*, to a hammer, or its equivalent, which is also suspended by a spring-stem, substantially as described.

EDWARD F. MCFARLAND.

Witnesses:

DANIEL O'CONNELL,  
MICHEAL O'DRISCOLL.