

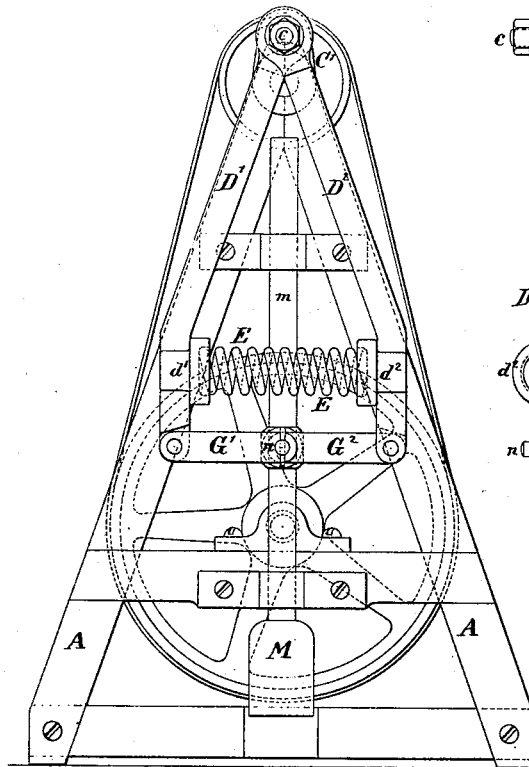
*G. F. Case,*

*Ore Crusher.*

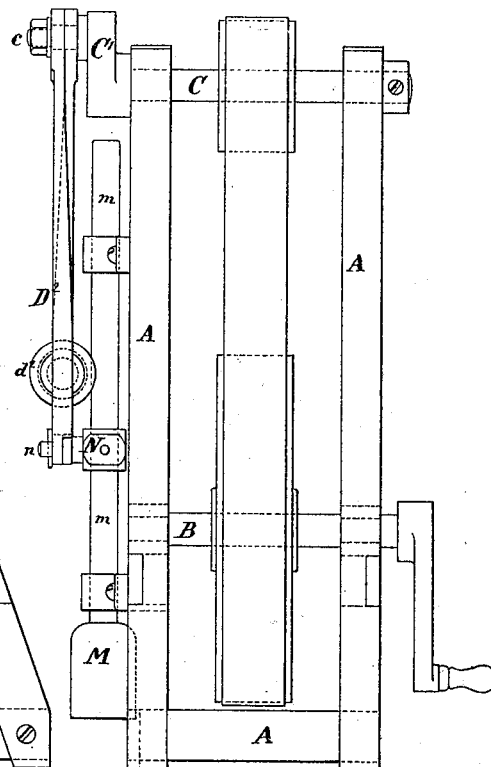
*No. 110,010.*

*Patented Dec. 13, 1870.*

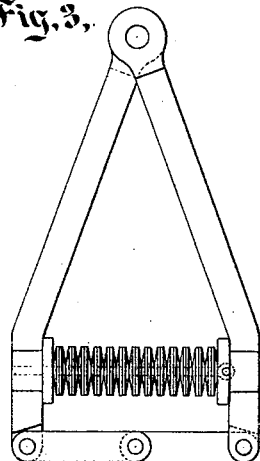
*Fig. 1,*



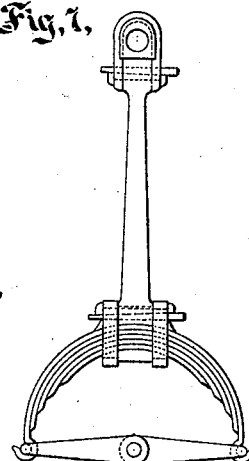
*Fig. 2,*



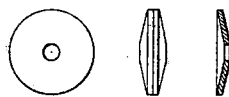
*Fig. 3,*



*Fig. 4,*



*Fig. 5, Fig. 6,*



*Witnesses,*  
*C. F. Livings*  
*A. Hermann*

*Inventor,*

*G. F. Case*  
*by his atty J. L. Slaton*

# United States Patent Office.

GEORGE F. CASE, OF WINDSOR, VERMONT, ASSIGNOR TO HIMSELF AND MILAN C. BULLOCK, OF SAME PLACE.

Letters Patent No. 110,010, dated December 13, 1870.

## IMPROVEMENT IN STAMPING-MILLS OR CRUSHERS.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern:*

Be it known that I, GEORGE F. CASE, of Windsor, in the county of Windsor and State of Vermont, have invented certain new and useful Improvements in Stamping-Mills or Crushers, adapted for crushing quartz and analogous material.

I do hereby declare that the following is a full and exact description thereof.

My invention relates to the parts which give motion to the stamper.

I impart the motion from a revolving shaft, turned by a steam-engine, or by any suitable power, and communicate a reciprocating motion, up and down, to the stamper, through peculiarly-arranged devices adapted to spring or yield.

I am able, by this mechanism, to operate rapidly and safely on all varieties of material, and on mixtures of the hardest with softer material.

At proper velocities, my machine strikes a harder blow upon the material with a given weight of stamp than in the ordinary process.

I will proceed to describe what I consider the best means of carrying out my invention.

The accompanying drawing forms a part of this specification.

Figure 1 is a face view of the machine, and

Figure 2 is a side view thereof.

The remaining figures represent modifications of some of the details.

Similar letters of reference indicate corresponding parts in both the figures where letters are employed.

A is a rigid frame-work of wood or other suitable material.

B is a shaft, giving motion, by means of a band, not represented, and suitable pulleys or band-wheels, to a shaft, C, carrying a crank, C', and crank-pin, c, to which latter are connected two strong pendulating arms, D<sup>1</sup> D<sup>2</sup>, having seats d<sup>1</sup> d<sup>2</sup>, to receive a strong spiral spring, E, which tends to urge the arms D<sup>1</sup> D<sup>2</sup> apart.

It will be understood that the arms or pendants D<sup>1</sup> D<sup>2</sup> are separate pieces, and have their bearings independent on the crank-pin c, so that they can swing to any required extent, to increase or diminish the distances apart of their lower extremities.

G<sup>1</sup> G<sup>2</sup> are links connecting the lower ends of these arms to the spindle or upright sliding bar which carries the stamper.

M is the stamper, which may be a heavy mass of wrought-iron, or other suitable material adapted to treat the rock or other material percussively; and

m is the upright spindle connected thereto, and

which is guided so that it is free only to reciprocate vertically.

The attachment of the links G<sup>1</sup> G<sup>2</sup> to this spindle is effected through the medium of a pin, n, which is strongly fixed on or formed in one piece with a collar, N, which may be adjustable by means of keys or other ordinary or suitable means, so that it may be changed up and down on the rod m, to compensate for wear or other influences acting on the face of the stamper.

My shaft B, and, consequently, my stamper M, may be driven with various degrees of velocity.

The spring E tending to separate the arms D<sup>1</sup> D<sup>2</sup>, that force tends to hold the links G<sup>1</sup> G<sup>2</sup> nearly or quite horizontal; but, when, in consequence of striking an unyielding mass of rock, or in consequence of inertia or other cause, the stamper is very powerfully impelled into a higher or lower position than this would require, the spring E yields by compression, and the links G<sup>1</sup> G<sup>2</sup> assume, temporarily, an oblique position, the central point or pin n either descending below, so as to incline the links G<sup>1</sup> G<sup>2</sup> into the form of the letter V, or rising above, so as to incline the same links into the form of the sides of the letter A.

When the stamp, by the velocity of its upward motion, contracts the arms together, it compresses the spring between them, and the power thus accumulated is given out again in the descent of the stamp, giving an additional force to the blow, over what would be given if the connections were rigidly attached between the crank and stamp.

Within certain limits, the more rapid the stamp is driven in its reciprocating motion, the harder the blow given at each revolution of the crank.

There are many modifications in which some of the features of my machine may be constructed. I do not confine myself to the precise form and proportion of the parts here represented, though I believe these to be the best for general purposes.

The additional figures show some of the more obvious modifications which may be made by any good mechanic.

Figure 3 shows the spring, made up of dishing-plates of steel or other elastic metal, guided and sustained by a straight bar of steel or iron extending through their interiors.

Figures 4, 5, and 6 show some of these parts, detached, on a larger scale.

Figure 7 shows a leaf-spring or compound plate-spring very highly bent.

This form operates somewhat differently from the others, but is very similar thereto in its general effects.

In this case the spring itself may be said to form the arms  $D^1 D^2$ , which approach and diverge to accommodate the inclinations of the links  $G^1 G^2$ .

I claim as my invention—

The within-described stamping or crushing-machine, having the stamper  $M$ , operated from a crank,  $C'$ , through elastic connections  $G^1 G^2$ , or their equiv-

alents, substantially as and for the purposes herein set forth.

In testimony whereof, I have hereunto set my name in presence of two subscribing witnesses.

Witnesses: GEORGE F. CASE.

J. B. FARNSWORTH,

R. M. HALL.