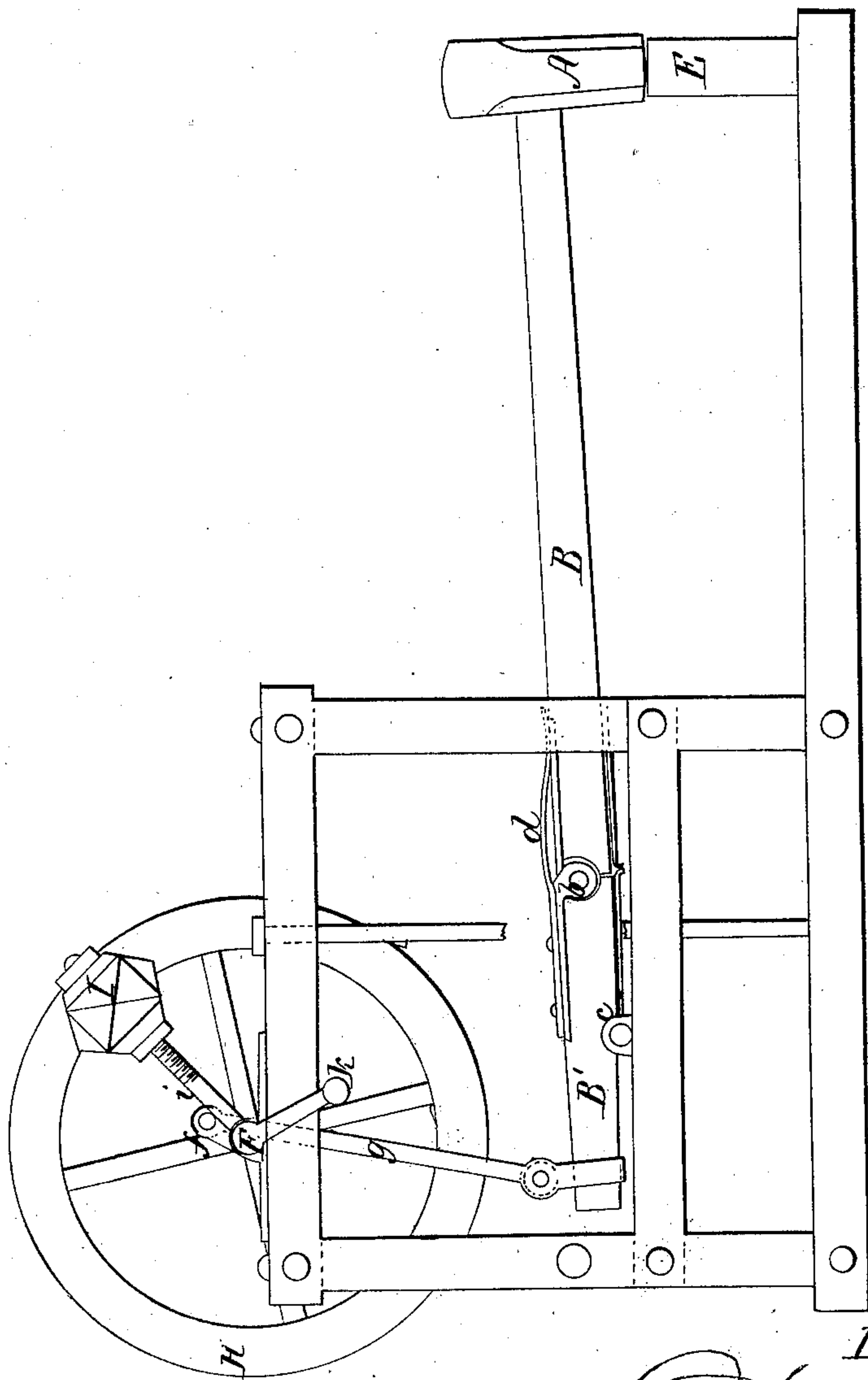


A. J. Grainger,

Oliver,

N^o 62,407.

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United States Patent Office.

ALFRED J. GRAINGER, OF WILMINGTON, ILLINOIS.

Letters Patent No. 62,467, dated February 26, 1867.

IMPROVED FORGING APPARATUS.

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, ALFRED J. GRAINGER, of Wilmington, Will county, State of Illinois, have invented a new and improved Tilt-Hammer; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification.

The drawing shows a side view of my improved tilt-hammer.

This invention relates to new and useful improvements in tilt-hammers; and the invention consists in driving the hammer by a connecting-rod, which takes hold of the power end of the helve, and connects it with the crank of the driving-shaft, and then providing the driving-shaft with a counterbalance for balancing the weight of the hammer so as to give a more even strain on the driving devices; and also in providing the helve of the hammer with a spring joint, so that the hammer may adjust itself to any thickness of metal which is placed on the anvil, or terminate its hammering stroke at different depths of stroke, while the power end of the helve has always the same depth of stroke, as hereinafter explained.

A, in the drawing, is the hammer; B is the helve, which is mounted on a rock-shaft or fulcrum, *c*, in the ordinary manner, and which is constructed in two parts, B B; and these parts are united by a hinge joint, *b*; and a certain measure of stiffness is given to the helve at the joint by a spring, *d*, which is riveted or bolted to B', and presses upon part B, as shown. F *f* is a crank-shaft, which drives the hammer by means of a connecting-rod, *g*, which connects the crank *f*, of the driving-shaft F, with the power end of the helve B' B. The shaft F has a fly-wheel, H, and has, further, a counterbalance or weight, I, attached to one side, so as to balance the weight of the hammer A. The arm *i*, which projects from shaft F, and which carries the counterbalance I, has a screw-thread cut on its outer end; and the weight I is screwed thereon, and may be screwed out or in on the said arm *i*, and nearer to or farther from the shaft F, and thereby the counterbalance powers of the weight I made variable or adjustable. *k* shows the crank, to which the power is applied. By means of the counterbalance I the weight of the hammer is balanced on the driving-shaft F, and the working of the parts is more smooth and free from shocks than heretofore; and, with a rigid connection, *g'*, between the driving-crank *f* and the helve B', the hammer may be driven with a much greater velocity, and a hammer of a given weight may be made to strike a heavier blow than when the hammer is left to fall by its own weight, as ordinarily.

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

1. I claim the connecting-rod *g*, crank-shaft F *f*, and counterbalance I, in combination with the hammer A B, substantially in the manner and for the purpose set forth.

2. I claim the hammer A, spring-jointed helve B' B, connecting-rod *g*, and crank-shaft F *f*, substantially as and for the purpose described.

ALFRED J. GRAINGER.

Witnesses:

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