

G. STACY.
Revolving Hammers.

No. 144,638.

Patented Nov. 18, 1873.

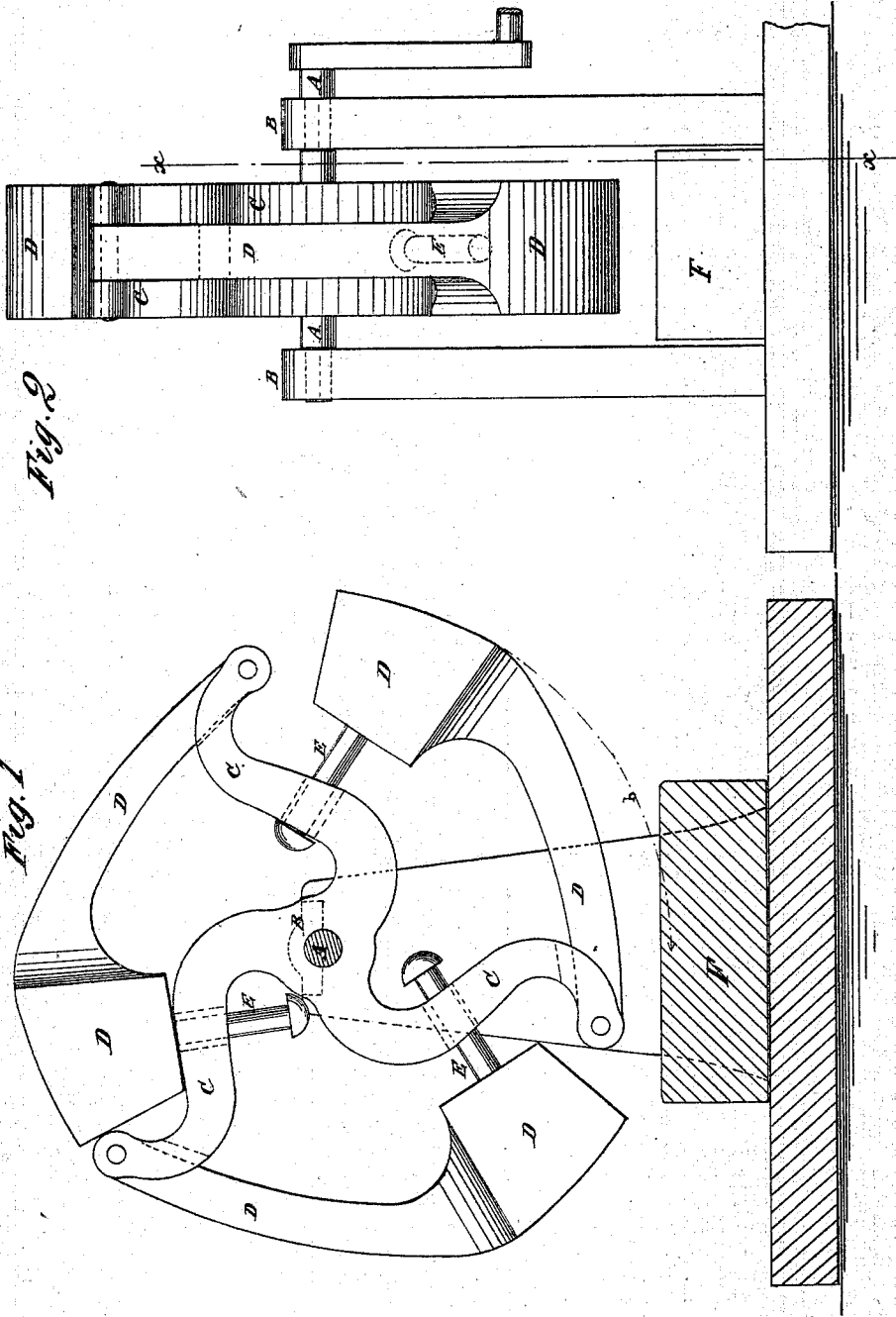


Fig. 2

Fig. 1

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UNITED STATES PATENT OFFICE.

GEORGE STACY, OF NANUET, NEW YORK.

IMPROVEMENT IN REVOLVING HAMMERS.

Specification forming part of Letters Patent No. **144,638**, dated November 18, 1873; application filed June 28, 1873.

To all whom it may concern:

Be it known that I, GEORGE STACY, of Nanuet, Rockland county, State of New York, have invented a new and Improved Rotary-Hammer Movement, of which the following is a specification, reference being had to the accompanying drawings forming part thereof.

Figure 1 is a side view of my new revolving-hammer movement, the shaft being shown in section through the line *x x*, Fig. 2. Fig. 2 is a rear view of the same.

My invention relates to a new and improved revolving-hammer movement; and consists in the combination of a rotary shaft or axle with a stock or hammer hinged to said shaft or axle at a point some distance radially from the axis of rotation, and swung backward on its hinge in the direction opposite to that of the rotation, and a stop revolving around the same axis with the stock; which serves to limit the distance from the axis of rotation, beyond which the outer or rear end of the said stock or hammer shall not be carried.

A is a rotary shaft, the journals of which revolve in boxes B attached to suitable supports or frame-work, which may be fixed or adjustable, as desired. C indicates radial arms attached to the shaft A, any number of which may be used. They may be made separate, or cast in one piece with a hub fastened upon the shaft. D indicates stocks or hammers hinged to the arms C. These stocks or hammers, instead of being left to swing freely upon their hinges, are swung backward in the direction opposite to that of the rotation to a position where their outer or rear ends are, preferably, only a little greater distance from the axis of rotation than are the opposite or hinged ends. In this position they are controlled by suitable stops connected to the said stocks, and that revolve with them around their axes of rotation, which gage or limit the distance from the axis of rotation, beyond which the said stocks cannot swing on their hinges, while they are permitted to swing freely away from said stops toward the axis of rotation. I preferably use the stops shown in the drawings, which consist of bolts or pins E, which are at one end attached to the stocks or hammers, the opposite ends passing through slotted holes in the arms C, with nuts or heads stopping against

the opposite side of the said arms. These pins or bolts thus arranged, while they prevent the stocks or hammers D from swinging outward beyond a certain fixed line, by playing loosely in the slotted holes in the arms C they do not prevent the stocks or hammers from swinging inward toward the shaft A. These stop devices should, for obvious reasons, be placed as far as possible from the hinged ends of the stocks D; but they may, if desired, be placed at any other point, where they will act to produce the result described; so also some other device instead of these pins or bolts may be employed for stops—as, for example, the hinge being made large and strong enough for the purpose, the stop may be located in it by so constructing it as to limit the motion of the stock outwardly; or the body of the stock may be extended on the opposite side of the hinge, and such extension stopped against the shaft, or some device attached to it.

It will be observed that the stop revolving with the hammer acts to limit the movement of the latter outward away from the axis of rotation during its entire revolution, and that the blow is intended to be delivered while the hammer is at its outer limit against the stop, and then to recoil inward from the contact with the object struck.

F is an anvil placed underneath the shaft A, and at such a distance therefrom that the hammers in revolving will strike its surface a little before they reach their lower limit, as indicated by the dotted line *b*.

When the hammers are in rapid motion, upon striking the anvil, or any hard substance lying thereon, they will recoil from the contact, and, while recoiling, pass the anvil or object.

If we suppose the anvil F to be a stone, the upper surface of which is to be dressed, a cutting-tool secured in the hammer-head, so that its cutting-point or edge projects suitably beyond the outer face of the said head, and the stone arranged at a suitable distance from the shaft to enable the said tool to give the required recoil, we then have this movement applied to stone cutting or dressing.

While I regard the method described of hinging the stock D to the shaft A as convenient and efficient, I do not intend to limit myself to the precise construction and arrangement specified.

For example, the said stocks may be pivoted on the face of a disk-wheel, and controlled by lugs or pins in said wheel—or they may be pivoted in recesses made in the peripheral face of a rotary cylinder, and controlled by the limits of such recesses; or they may be connected with the arms C by a spring connection, which will permit them to vibrate as upon a hinge, the essential conditions being that said stocks, hinged or pivoted at one end at a point some distance from the axis of rotation, shall be stopped from swinging outward beyond a certain determined line, while they are left free to swing inward from that line toward the shaft, or restrained by a spring, if desired. The stops may be made adjustable, so as to fix the limit of the outward movement of the stocks D, at a greater or less distance from the axis of rotation, at will; and the pivotal point of the said stocks may also be adjustable. Upon the outer or rear ends of the stocks D are to be fixed hammer-heads, or heads for holding cutting-tools, or any other instruments with which it is desired to deliver blows or otherwise operate.

In the drawings I have represented hammer-heads formed, as is preferable, severally of a single piece of metal, with the body of the stock; but this is not, of course, essential. The head and body of the stock may be made separate, and attached together; and the latter may be made of wood, or wood and metal, or any other suitable material, as preferred.

The length of the stocks D, the distance of their hinged connections from the axis of rotation, and the weight of the hammer or tool head, may be varied to suit the work to be done and the force employed.

The anvil, or other object upon which it is desired to deliver blows, or otherwise operate, is to be placed at a certain determined distance from the axis of rotation, having reference to the position of the hammers, or their distance from the axis of rotation when swung outward to their stops, to the force of the blow desired, and to the effect intended to be produced. It must, however, be placed in relation to the hammers, where the latter, after striking, may pass it while rebounding from the contact. An operator of ordinary skill will readily learn to relatively adjust the hammers and the object to be operated on. To permit of this adjustment, the cylinder may be adjustable, and the anvil or object fixed; or the latter may be adjustable, and the former fixed; or both adjustable. When this movement is employed in any work in which a cutting-instrument is used, a head properly constructed for holding such cutting-instrument is to be attached or formed onto the outer or rear end of the stock D, instead of a hammer-head proper. The object to be operated upon, properly supported, is placed with reference to the cutting point or edge of the tool, so

that it will strike the object, to give the required cut, and then in its continued rotation pass the same, either by recoiling or cutting its way clear, or both. The operation of this movement is obvious, from the description of it already given.

An object to be operated upon, whether merely to receive a succession of blows, or to be subjected to a concussive action of a cutting-tool, is placed and held within proper range of the hammer heads or tools, to permit them to strike it in rotating, and then to pass it by recoiling or falling back toward the shaft A until the object operated on is reduced to its gaged limits. The extent of this recoil, to enable the hammer to pass the object, needs to be only little more than equal to the difference in the distance of the object and the striking part of the hammer, respectively, from the axis of rotation; and as the hammer from its position, as related to its pivotal connection with the shaft A, must, in recoiling, move almost radially back toward the shaft, it needs to swing only a short distance on its hinge to pass the object.

By varying the distance of the object from the axis of rotation, with the hammer revolving, when at its outer limit at a determined distance from such axis, the blow may be varied in force from the slightest and most delicate touch to the heaviest blow which the full momentum of the hammer is capable of giving.

Among the uses to which this movement may be usefully applied may be named the forging, forming, or otherwise beating or hammering of metals, cutting and dressing stone, crushing stones and ores, crushing and flouring grain, breaking flax, operating a drill, reducing wood or other fibrous material to pulp for paper-making, beating gold or other metals into foils, &c., or any other purpose where a blow or succession of blows are required.

I do not claim, broadly, the hinging of the hammer to the rotary shaft, and folding it back, as specified; nor do I claim, broadly, limiting the outward movement by a stop, intending to confine my claim to the devices and combination described, in which the stop rotates around the shaft or axis of rotation with the hammer, whereby the hammer has a fixed limit beyond which it cannot be carried outward from such axis during any part of its revolution, and is enabled to deliver its blows while at its outer limit against the stop.

What I claim as my invention, and desire to secure by Letters Patent, is—

The rotating shaft A, the arm C, the hammer D, and stop E, all combined and arranged as shown and described.

Witnesses: GEORGE STACY.
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