C. HAMMELMANN.

MECHANICAL-MOVEMENTS FOR OPERATING BLOWERS IN FORGES.

No. 192,623. Patented July 3, 1877.

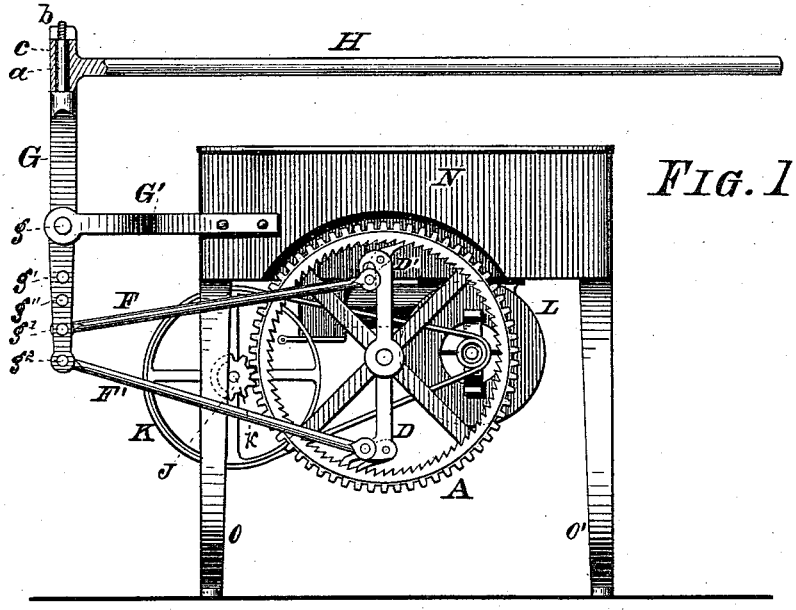
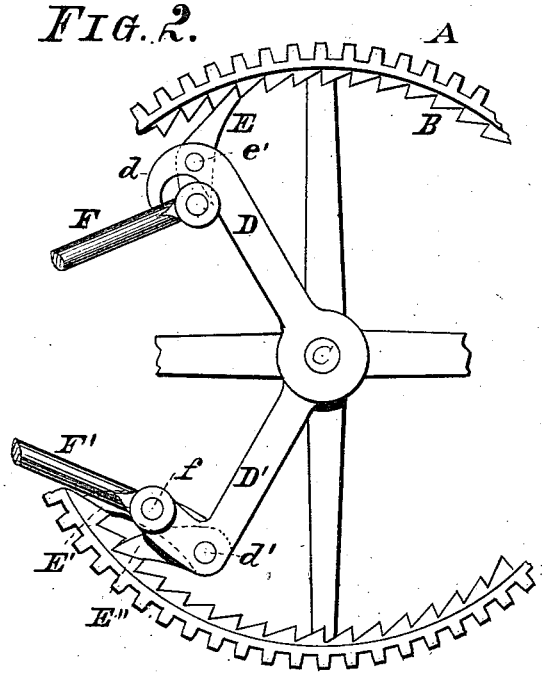
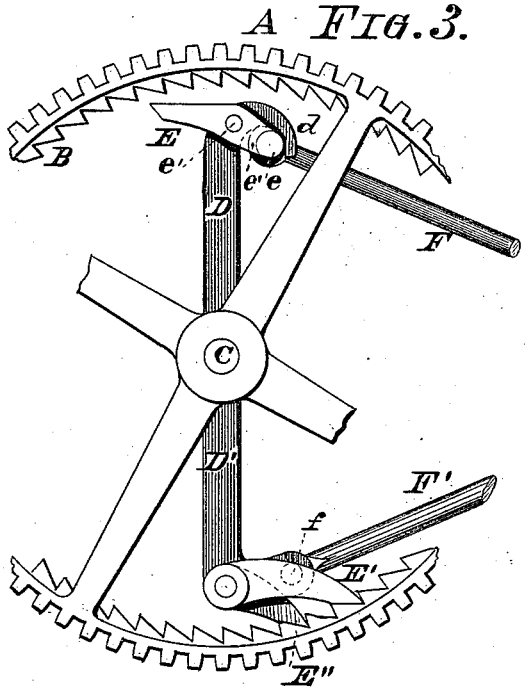


FIG. 1.

FIG. 2.



A FIG. 3.



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UNITED STATES PATENT OFFICE.

CHARLES HAMMELMANN, OF BUFFALO, NEW YORK.

IMPROVEMENT IN MECHANICAL MOVEMENTS FOR OPERATING BLOWERS IN FORGES.

Specification forming part of Letters Patent No. **192,623**, dated July 3, 1877; application filed May 25, 1877.

To all whom it may concern:

Be it known that I, CHARLES HAMMELMANN, of Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements on a Mechanical Movement; and I do hereby declare that the following description of my said invention, taken in connection with the accompanying sheet of drawings, forms a full, clear, and exact specification, which will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to improvements on portable forges, and the mechanism for operating the same; and it consists in the arrangement of parts and details of construction as hereinafter first fully described, and then pointed out in the claims.

The object of my said invention is to overcome several drawbacks inherent to the devices now in use for operating that class of forges in which a rotary blower is used as the medium for obtaining the blast, viz., the running of the blower in the wrong direction, and the stopping at the dead-centers, and consequent trouble of starting the blower.

To overcome these objections I provide the main spur-wheel of a train of gearing with one or more radius-bars pivoted upon the axle of said main spur-wheel, and provided with pivoted pawls, said radius-bars being connected with the operating-lever, and acting upon the main wheel to rotate the same, all as hereinafter more fully explained.

In the drawings heretofore mentioned, which form a part of this specification, and serve to illustrate my said invention more fully—

Figure 1 is a front elevation of a portable forge provided with my improvements. Fig. 2 is a fragmental front, and Fig. 3 a similar rear, view of the main wheel and its accessories.

Like letters of reference indicate corresponding parts in all the figures.

A is the wheel-shaft of a train of gearing such as usually employed in forges for operating the fan-blower, provided on its periphery with cog-teeth, and on its side with an annular projecting ring, having in its inner periphery ratchet-teeth B. This wheel is mounted upon a fixed shaft or stud, C, together with two radius-bars, D D′, respectively provided each with a pawl, E E′. These bars D D′ are connected to the hand-lever G by means of two connecting-rods, F F′, which lever is centrally pivoted upon the pin *g* in the bracket G attached to the box N, and operated by hand-rod H. The spur-wheel A meshes with the pinion J secured to the axle *k*, together with the pulley K, and drives the fan-blower L in conjunction with a belt passing from the pulley K to the arbor of the said fan.

One end of the radius-bar D is bent, as shown at *d*, and the pawl E pivoted to this end of said radius-bar is provided with an arm, *e′*, to which the connecting-rod F is bolted by means of the pin *e* passing through the space in said bend. The radius-bar D′ is bent at right angles at its lower extremity, and connects with the connecting-rod F′ at *f*. The pawl E′ is pivoted to this radius-bar in its angle together with the auxiliary pawl upon the stud *d′*.

The handle H is provided with a socket, *c*, by means of which it is enabled to revolve upon the pin *a* of the lever G, a nut, *b*, being screwed onto the end of said pin to prevent the handle from being removed from its arbor.

This arrangement of the handle H enables me to operate the forge in almost every position, which is a very desirable feature in forges of this kind, because it enables the attendant to reach any tool, &c., within the compass of the forge-handle without stopping the blast.

The operation of my device is as follows: The handle H is operated in precisely the same manner as those now in use, by successively raising and lowering or depressing it. This causes the lever G to oscillate, and thereby to impart a similar motion to the radius-bars D D′. These bars, being located above and below the center of the main wheel, swing back and forth within the said main wheel, both in the same direction, and alternately engaging with their pawls E E′ the serrated inner circumference of said main wheel A, cause the same to revolve, and thereby to impart motion to the remaining parts of the gear. The connecting-rod F, being pivoted to the pawl E on the short arm thereof, causes, with every movement, a corresponding motion of said

pawl; thus, when said rod commences to travel in a direction from the main wheel, it causes the said pawl to partly revolve around its pivot, and thereby to disengage the pawl from the ratchet-teeth B before the radius-arm D is set in motion. This takes effect as soon as the pivot *e* reaches the bend *d*. The pendent radius-bar D′ is provided with a gravity-pawl, E′, and needs, therefore, no such device to actuate the pawl as the upper bar D.

In order to positively engage the wheel A with the pendent radius-bar it (the bar) is provided with two pawls, either one of which will cause the revolution of the main wheel in conjunction with its accessories, as heretofore described; and, on account of there being two pawls, any possibility of the oscillation of said radius-bar without engaging the main wheel is thereby avoided.

It will be observed that the upper pawl is directly operated by the lever and connecting-rod, the radius-bar simply acting as a support. The operation of said pawl is therefore a positive one under all circumstances.

Instead of the two pawls and radius-bars, either the upper or lower one may alone be employed, and perform the duty of revolving the main wheel in the same manner as both would conjointly, except that in this case the hand-lever would operate in one direction only. But since the momentum of the gearing when in motion will cause a further revolution of the same before being exhausted, such an arrangement may in many instances be sufficient for all practical purposes, especially when an even and very regular motion is not a particular object. So may the ratchet-teeth B be placed into the edge, or upon the external periphery of the wheel A, and with a slight modification of the radius-bars and pawls be operated from the lever G in precisely the same manner as the device heretofore described; or the ratchet-teeth may be dispensed with, and the pawls provided with comparatively large bearing-surfaces to act as brakes upon the annular projection. All these modifications will produce the desired results in the same manner as the devices heretofore described, and are, therefore, mechanical equivalents thereof.

It is obvious that in my device a difference in the length of the stroke of the lever G causes the main wheel to revolve faster or slower, as the case may be, in contradistinction to a crank-movement wherein the stroke is a fixed one, and in which the speed of the main wheel is altogether dependent upon the number of strokes in a given time. My arrangement is therefore a very desirable one, because it enables the main wheel being operated to the desired speed without necessitating the tiresome rapid vibration of the operating-handle.

My improved device possesses the further advantages of having no dead-points, or such points in which the wheel cannot be started with the handle, nor can the wheel be started in the wrong direction.

It is also evident that my improved device for operating machinery is, in addition to its indicated purpose, applicable for driving machines of different kinds, such as lathes, drill-presses, &c., velocipedes, and many others.

Having thus fully described my invention, I desire to secure to me by Letters Patent of the United States—

1. The mechanism for operating forges, &c., consisting of the main wheel A, having the serrated annular projection B, and being mounted upon the fixed arbor C, the pendent radius-bar or lever D′ provided with the two pawls E′ E″ pivoted to said radius-bar and engaging with the teeth of the annular projection, the connecting-rod F′, and the lever G, the whole constructed and arranged substantially as specified.

2. The combination, with the lever G having the pin *a*, of the handle H provided with the socket *c*, as described, for the use and purpose stated.

3. The combination, with the main wheel A having the serrated projection B, and mounted upon the shaft C, of the radius-bar D provided with the bend *d* and the pivoted pawl E, radius-bar D′, having the pawls E′ E″, connecting-rods F F′, lever G, and handle H, the whole constructed and arranged to operate in a manner substantially as hereinbefore set forth, for the purpose specified.

In testimony that I claim the foregoing as my invention, I have hereunto set my hand and affixed my seal in the presence of two subscribing witnesses.

CHARLES HAMMELMANN. [L. S.]

Attest:

MICHAEL J. STARK,

FRANK HIRSCH.