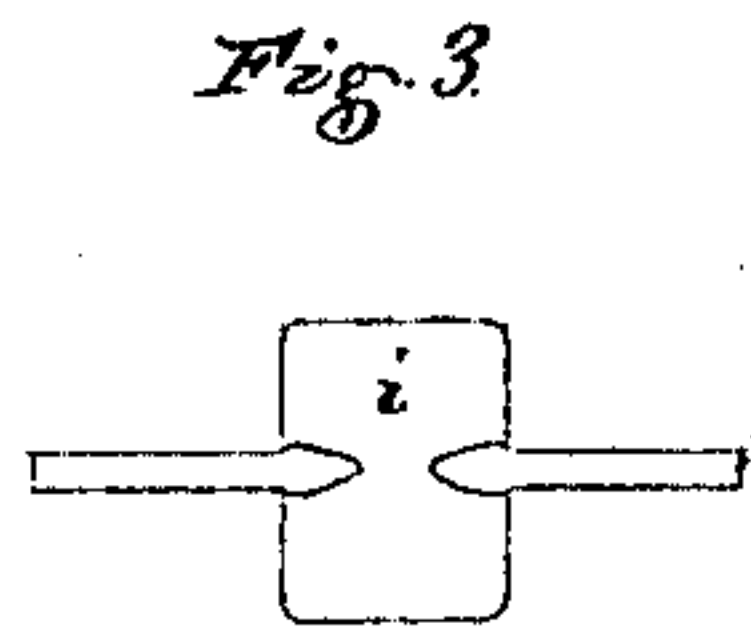
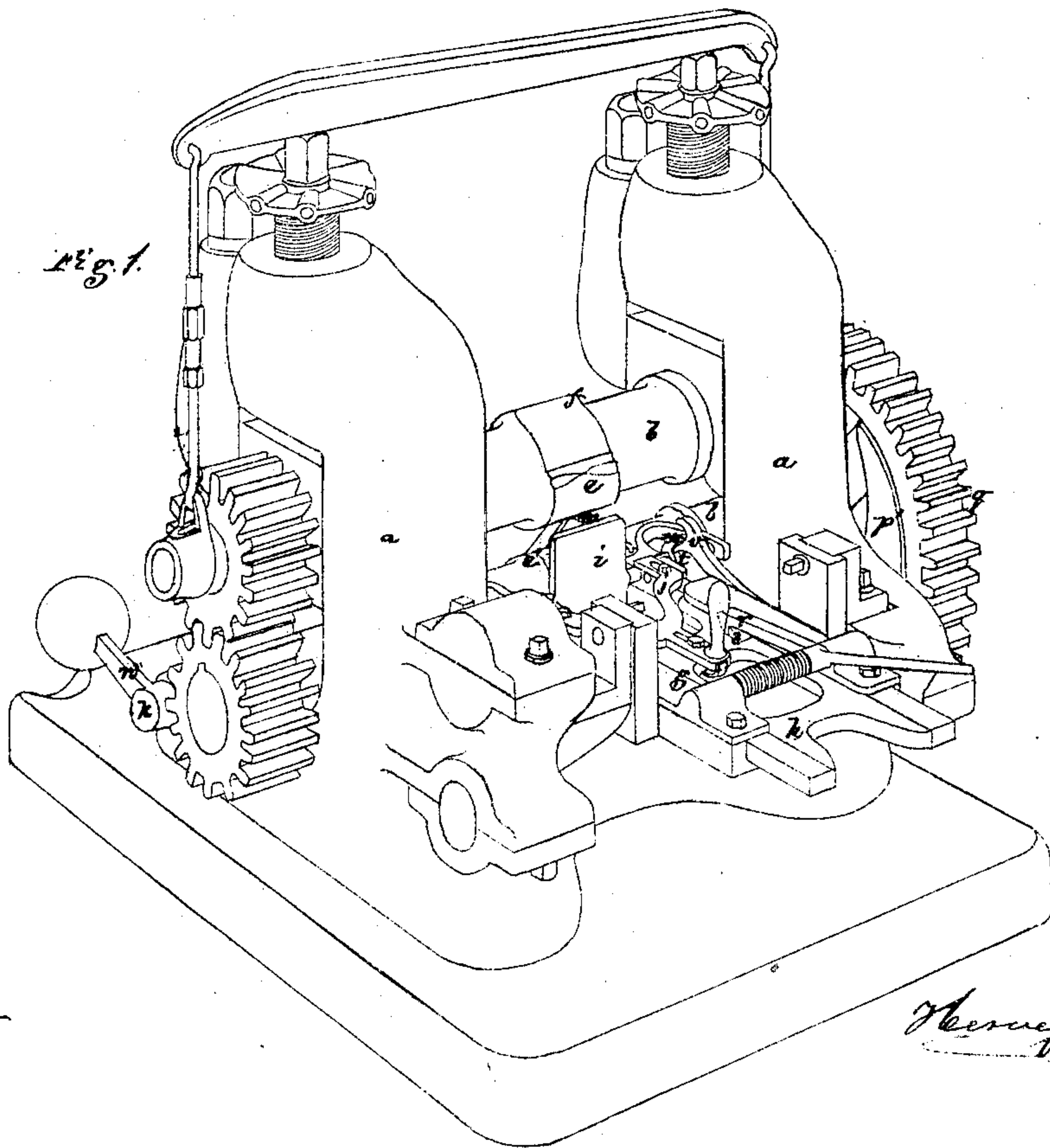
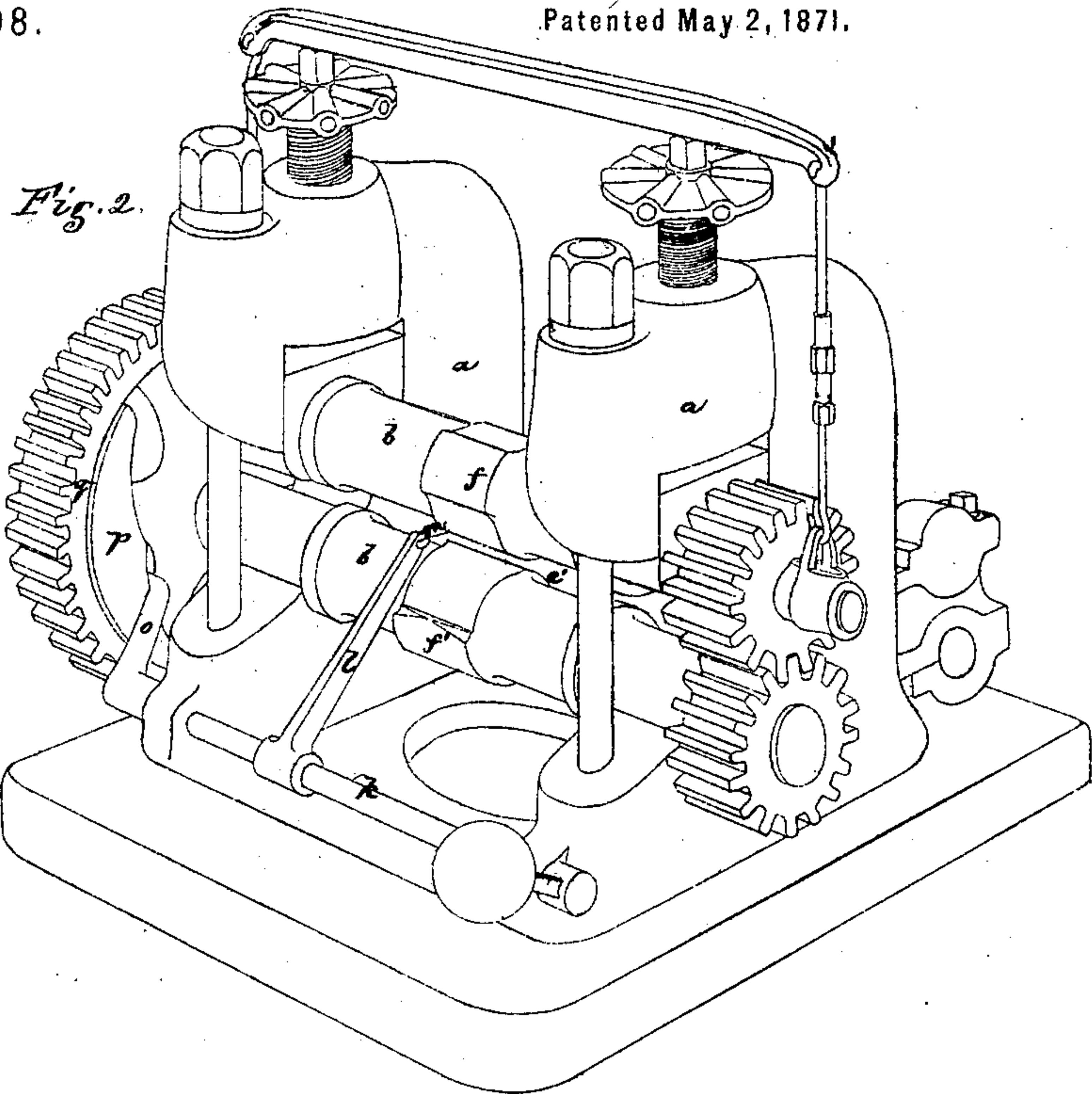


H. WATERS.

Improvement in Machines for Rolling Hoe-Blanks.  
No. 114,498.

Patented May 2, 1871.



Witnesses.  
S. B. Kidder  
Thomas Gould

H. Waters



# United States Patent Office.

HERVEY WATERS, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 114,498, dated May 2, 1871.

## IMPROVEMENT IN MACHINES FOR ROLLING HOE-BLANKS.

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, HERVEY WATERS, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improved Machine for Rolling and Shaping Metal; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

The invention relates to the construction and arrangement of mechanism for rolling and shaping metal by means of dies formed upon or in the surfaces of two rolls.

The invention consists in the employment of a mechanism by which, at the will of the operator, the work is automatically introduced into the dies, in connection with a mechanism by which the blank, after being returned from the action of the rolls, is automatically turned for its next presentation to the dies, the roll being constructed with sets of conversely-working dies upon the respective opposite faces thereof, so that the blank may be twice rolled at each rotation of the dies.

The drawings represent a rolling-mill embodying the invention, and adapted to rolling hoe-blanks—

Figure 1 showing a front, and

Figure 2 a rear perspective view of the machine.

*a a* denote the stands or housings, in which are journaled two rolls, *b b*, geared together, and having formed on opposite portions of their surfaces two sets of dies, *e f e' f'*, the die *e* of the upper roll working in conjunction with the die *e'* of the lower one, and the die *f* of the upper roll in conjunction with the die *f'* of the lower one, the surfaces on each roll between the dies being lower than the working surfaces of the dies in order that the blank may be introduced between the opposite rolls when open, and held in position for the dies to bite upon it in their rotation, and roll and return it to or toward the side from which it was entered.

In front of the machine and between the housings is a table or stand, *g*, having ways in which a carriage, *h*, slides; this carriage carries the blank *i* to be rolled.

The blank, which in this case is a hoe-blank, is supported upon the carriage in such manner that it may be turned at proper times to present the opposite ends thereof to the action of the dies, the bearings in which it turns being covered by a slide, *j*, by withdrawal of which the blank may be introduced into or removed from the machine.

In rear of the machine is a rocker-shaft, *k*, turning in bearings made in the housings *a*.

This shaft has an arm, *l*, fixed to and extending up from it, to the upper end of which the carriage *h* is connected by a link, *m*.

Another arm, *n*, extending outward from this rocker-shaft, carries a weight, the tendency of the weighted arm being to draw the carriage *h* between the rolls, as will readily be understood.

The opposite end of the rocker-shaft carries another arm, *o*, the upper end of which is bent outward into the path of two cams, *p p'*, upon a gear, *q*, on the lower roll.

The carriage *h* is held stationary, when the blank is not being rolled, by a hook or latch, *r*, hooking into a stop, *s*, on the carriage, the hook being kept normally in position by a spring, and having a handle, by the depression of which the operator can release the carriage from the hook. The carriage being so fastened in position, the arm *o* is held out of the path of the cams *p p'*.

When the operator, by depression of the handle, releases the carriage (the dies being in proper position) the weight on the arm *n* draws the carriage with its blank toward the rolls, the arm *o* strikes the cam *p*, and the weight draws the blank between the open rolls as fast as the cam permits it to enter, this being done to effect the gradual introduction of the blank, instead of allowing it to be violently pulled between the rolls by the action of the weight alone. A stop upon the table *g* determines the extent of this movement of the carriage, which is such as to bring the blank into position for the dies to strike upon it. As the rolls rotate the dies bite upon the blank, and having passed their length upon it, carrying it toward the side from which it was entered, the next cam *p'* strikes upon the arm *o* and carries it inward, moving the carriage back until it is locked in position by the spring-latch *r*.

Thus it will be seen that the work is automatically introduced between the rolls and automatically returned from them, the cam acting negatively in such introduction and positively in the return of the blank.

By keeping the latch *r* up the blank will be continuously introduced to the action of the dies, first one end and then the other alternately, the rolls being screwed together to roll down the blank after each operation of the two sets of dies.

Blanks like that shown in figs. 1 and 3 (the latter figure showing the opposite surface of the blank) are for the manufacture of that class of hoes in which the shanks are solid with the blades, that shown having the shanks for two blades drawn upon it, one at each end thereof, with the material for two blades (in connection) between the shanks, one surface of the blank being flat, while the other surface has a projection upon it where the shanks join the blades.

The mechanism by which the blank is turned after the first set of dies has acted upon it, and before its presentation to the next set, is as follows:



The shanks of the hoe-blank rest in bearings on top of the carriage, and one of the shanks has slipped upon and so as to turn with it a collar, *t*, having two projections, *u*. The blank when placed on the carriage is in a vertical position, as seen in fig. 1, and the projections *u* are in line therewith. A hook extends up in rear of the lower projection, and as it begins to move toward the rolls this hook, dragging upon the lower projections, turns the collar and with it the blank into a horizontal position, in which position it is carried through and returned from the rolls.

As it recedes from the rolls the projection *u*, last acted upon by the hook, strikes in a fork, *v*, and is turned up by the movement of the projection *u* against the same, thus bringing the blank again into vertical position, but with its opposite end up. When the blank next advances toward the rolls the lower hook *u* is again acted upon as before, carrying the blank again into horizontal position, but with the opposite end presented for the action of the rolls.

The automatic arrangement herein shown, and which is suitable for turning this blank as described, may be changed in rolling other forms or kinds of work, the invention not being merely in the mechanism here shown for the purpose, but in an organization by which the blank is automatically turned after

one operation of the dies upon it, and so as to bring it into position for the action of another set of dies.

Two sets of dies are shown upon the surfaces of the rolls, as above alluded to, one set, *f f'*, rolling one end of the blank from the line of the shanks to the edge of the blanks, (the upper die being formed to roll the flat side of the blanks, and the lower die being formed to roll the side upon which the shanks project beyond the surface of the blank,) and the blank being then turned, the other set *e e'* being formed conversely to roll the opposite end from the shanks to the edge thereof, the lower die rolling the flat side and the upper die the side upon which the shanks project beyond the surface of the blank.

I claim—

In combination with the alternating roller-dies, the mechanism for both automatically introducing the blank between the dies and turning the same so that the dies may act conversely upon it substantially as described.

In witness whereof I have hereunto set my hand this 14th day of November, A. D. 1865.

HERVEY WATERS.

Witnesses:

S. B. KIDDER,  
FRANCIS GOULD.