

H. WATERS.

Machines for Rolling Scythes.

No. 138,216.

Patented April 22, 1873.

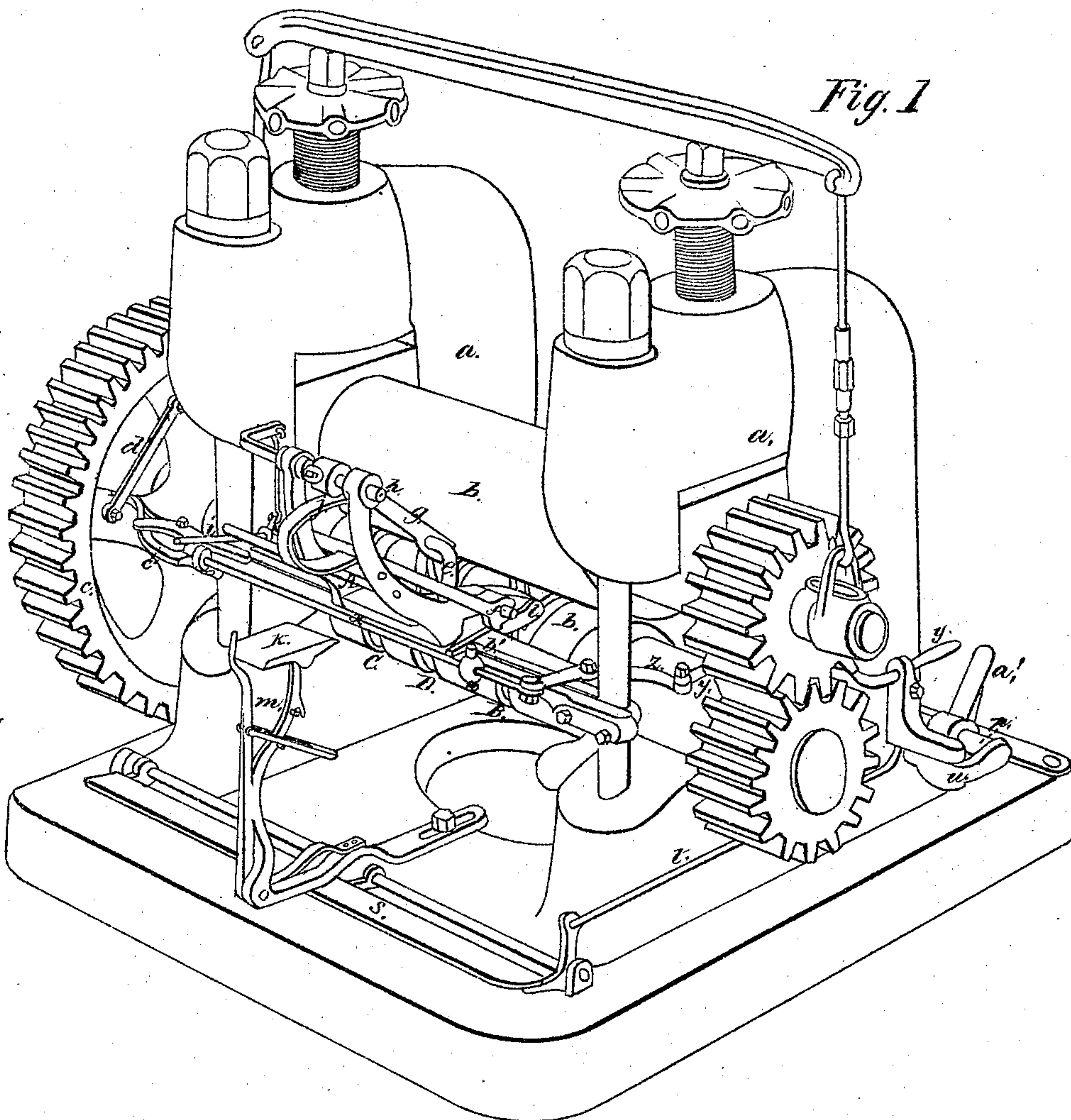


Fig. 1

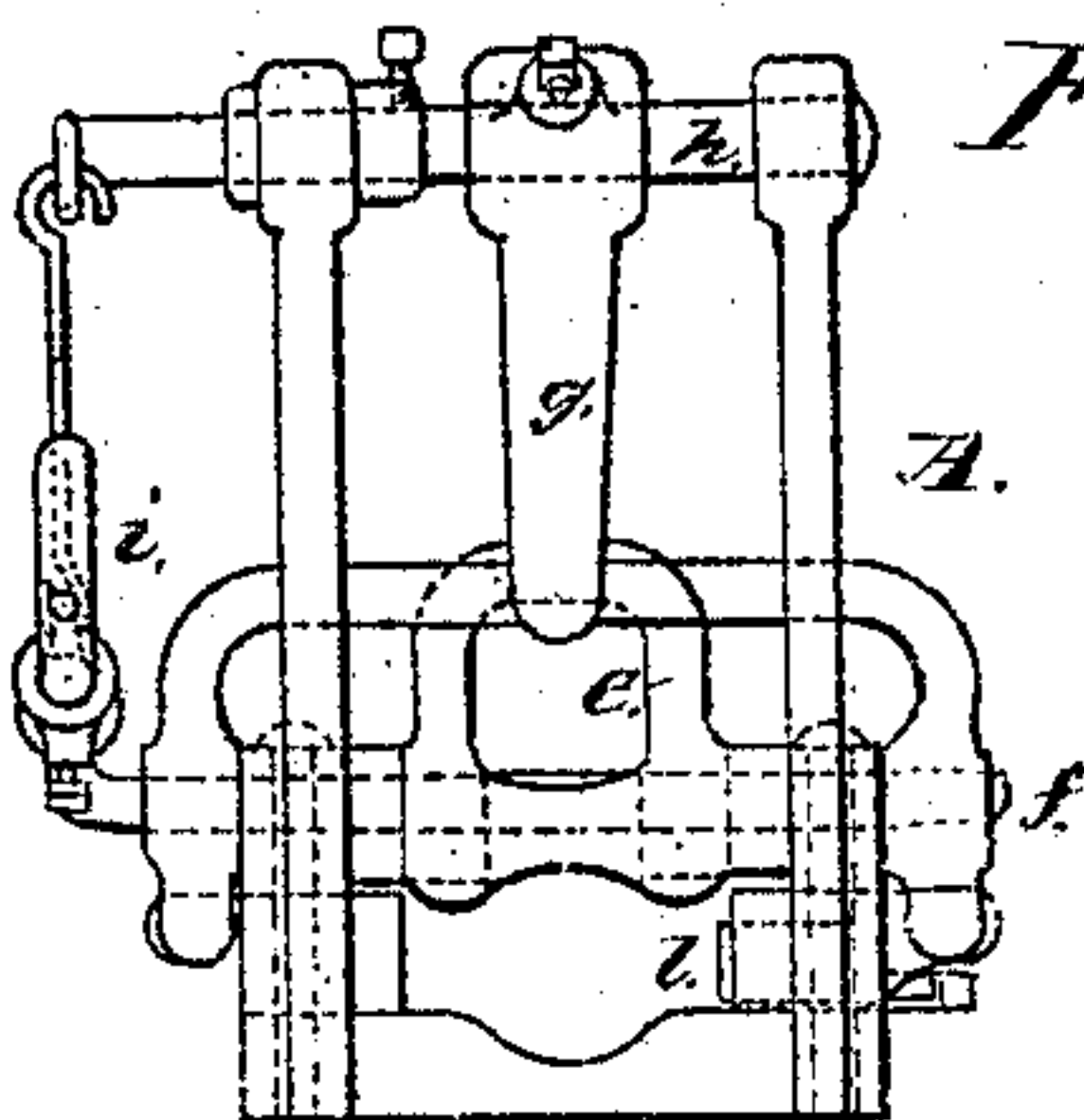


Fig. 3.

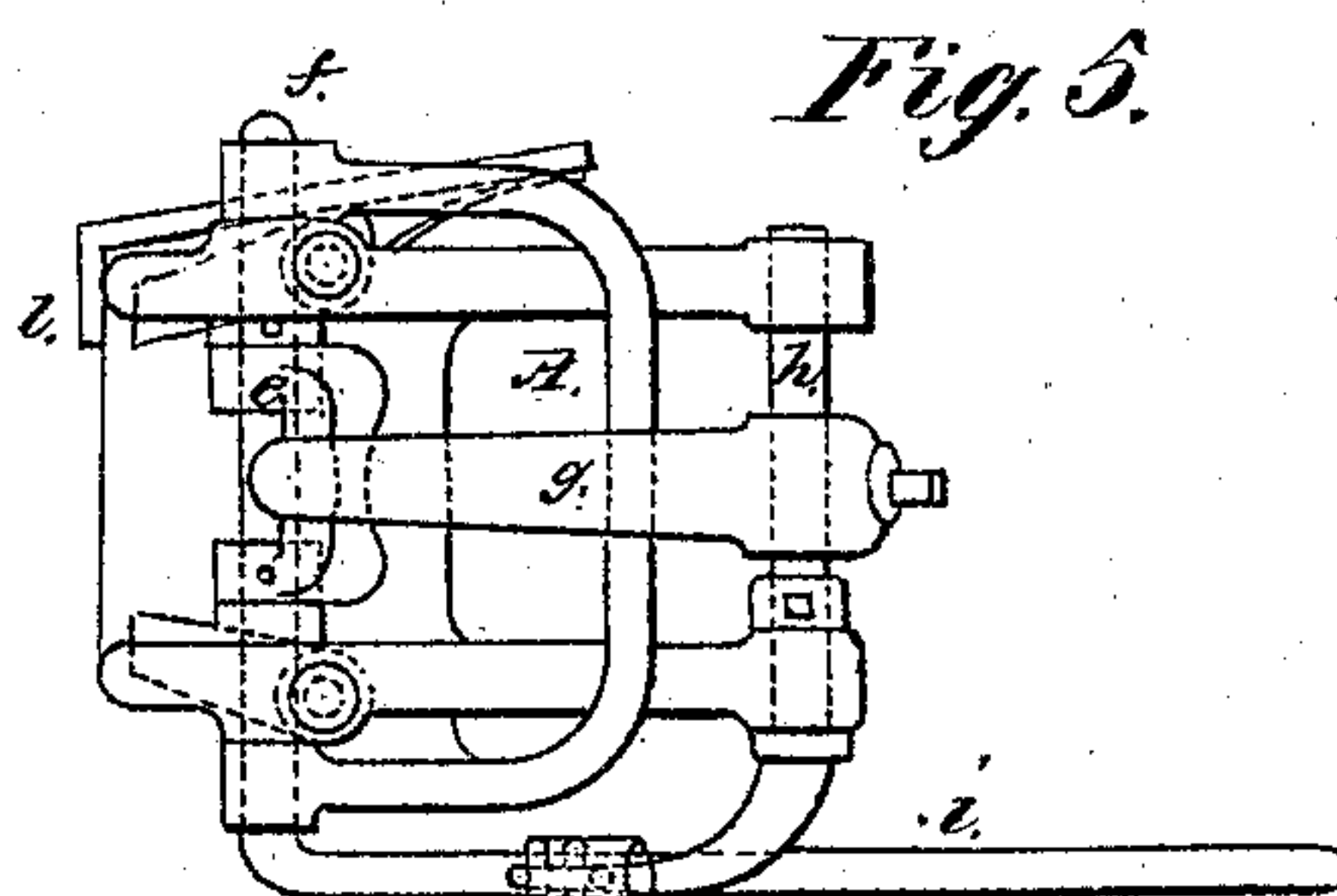


Fig. 5.

Witnesses:
W. B. Cowley,
Francis Gould

Inventor:
Hervey Waters

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Fig. 2.

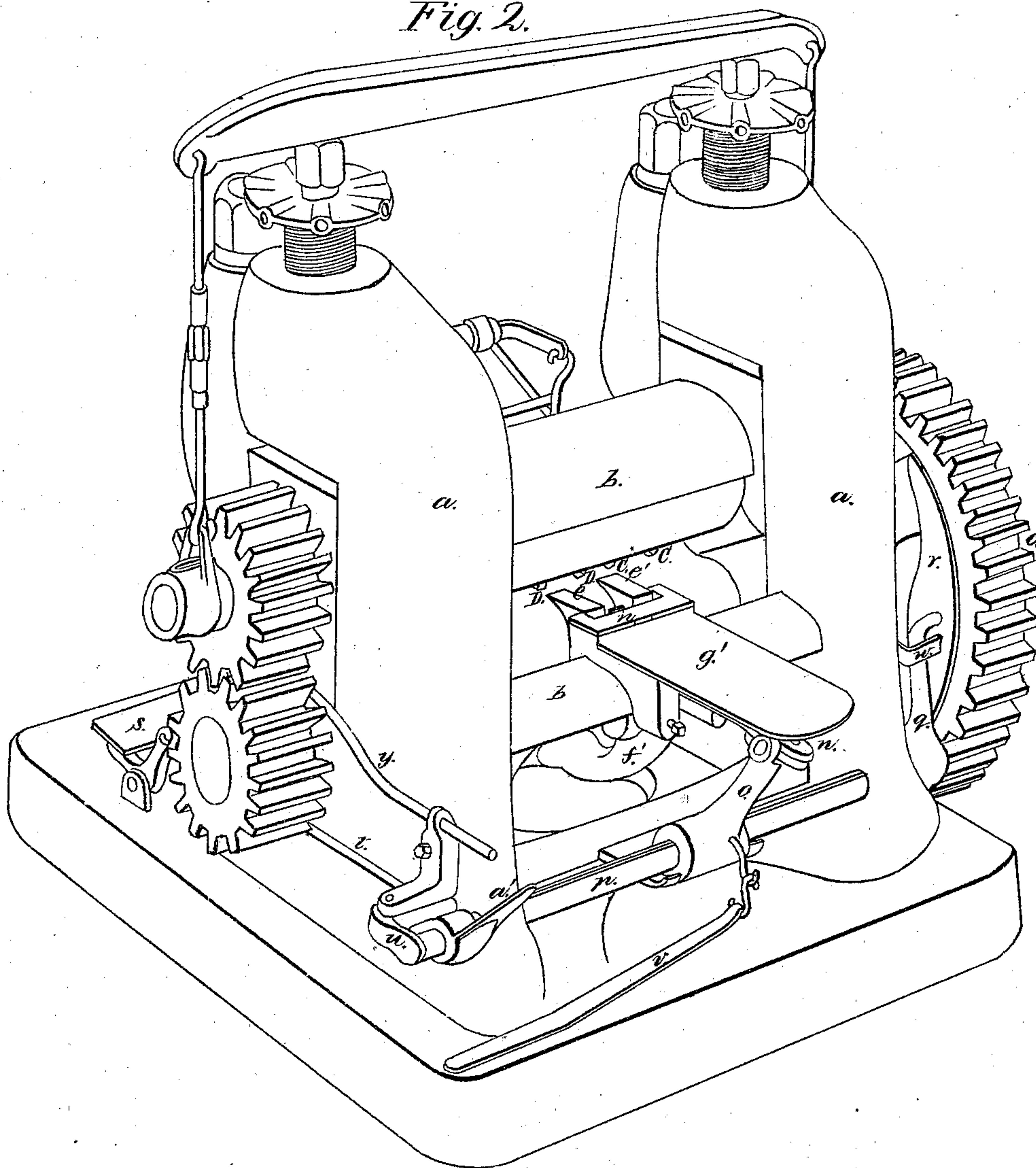
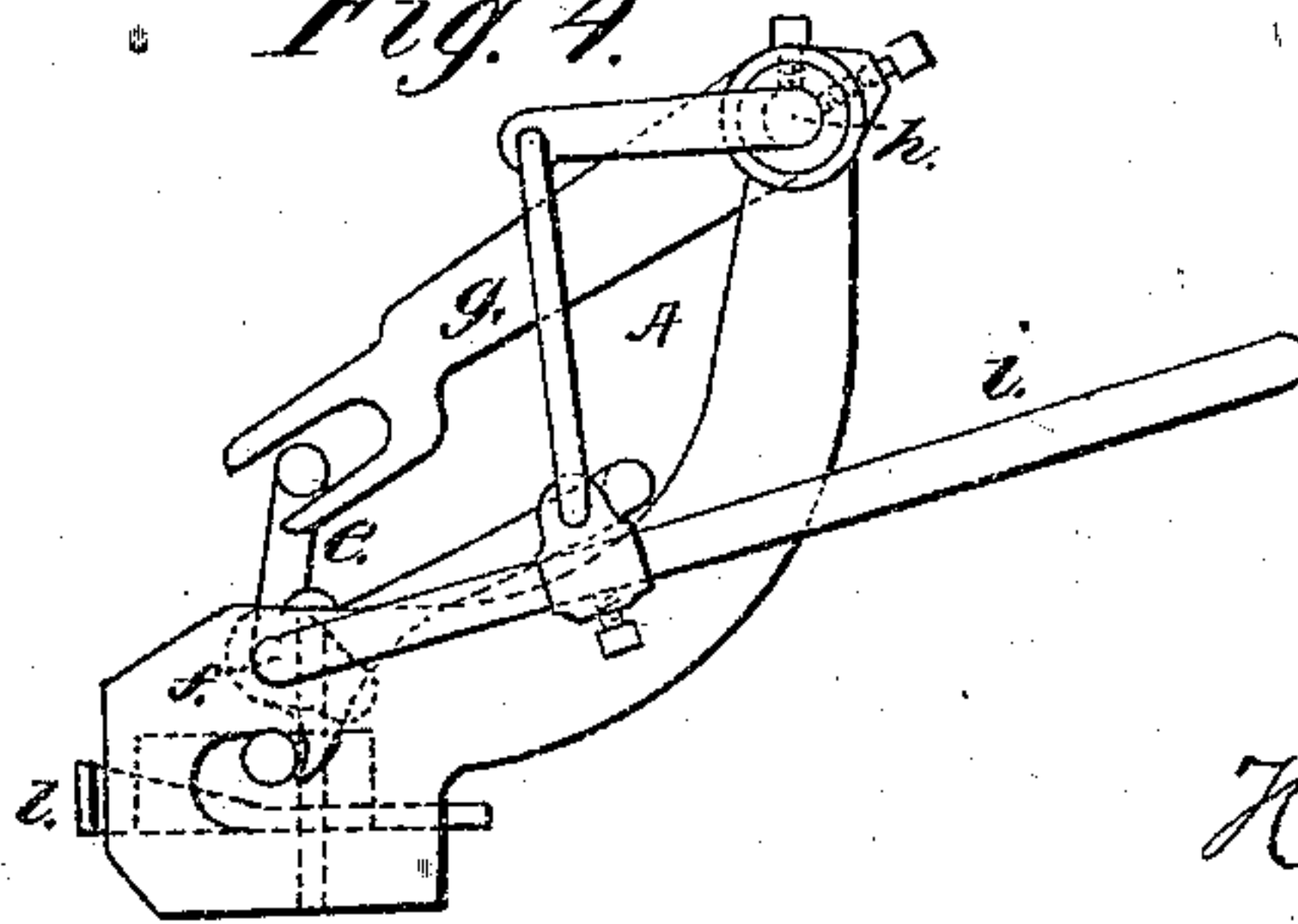


Fig. 4.



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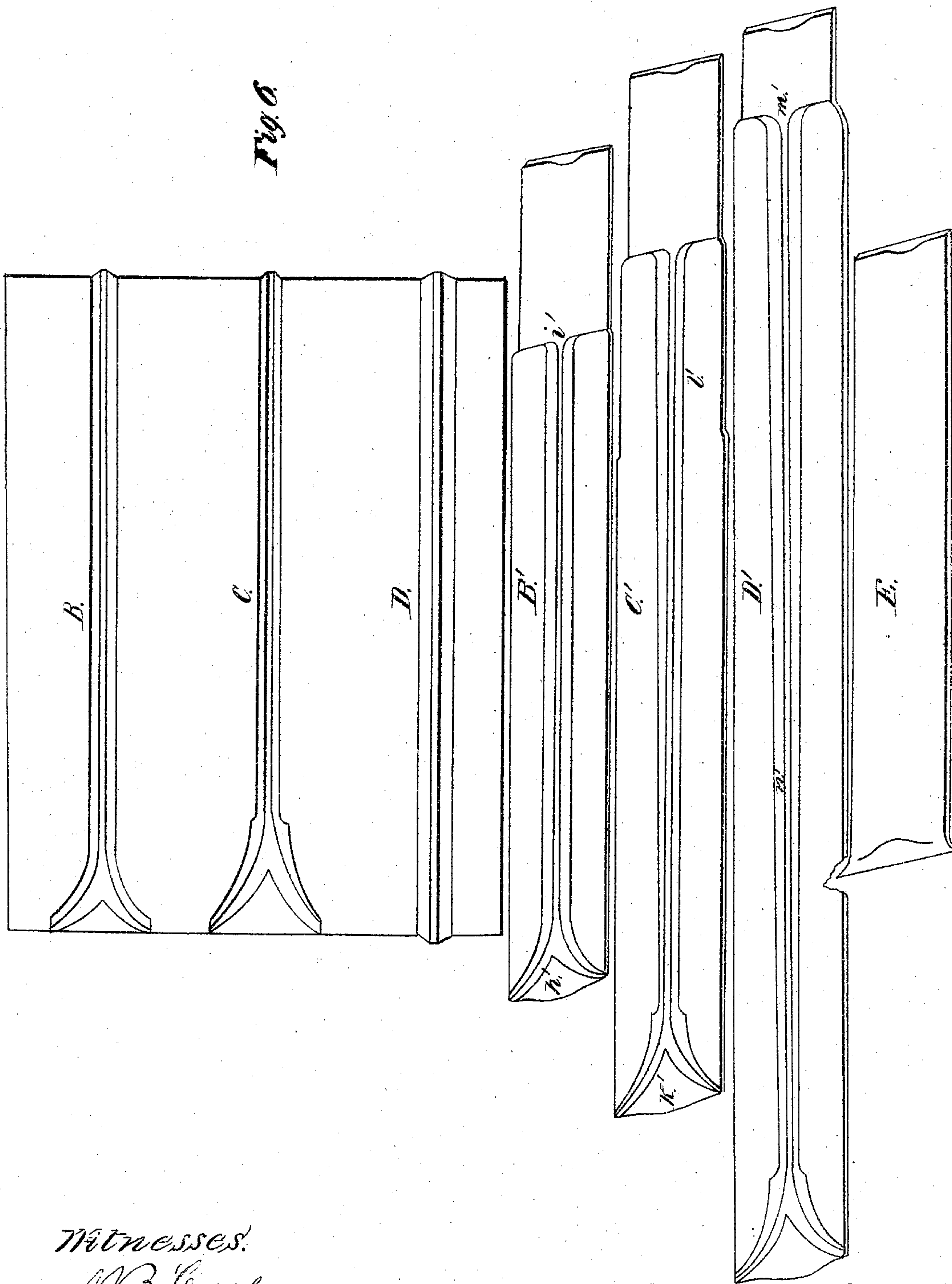
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Fig. 6.



Witnesses:

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Francis Gould*

*Inventor:
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UNITED STATES PATENT OFFICE.

HERVEY WATERS, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR ROLLING SCYTHES.

Specification forming part of Letters Patent No. **138,216**, dated April 22, 1873; application filed September 9, 1865.

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 Scythes, &c; 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 is adapted particularly to the manufacture of that class of scythes in which the backs are solid with the webs, or to that process in said manufacture known as "plating," which consists in reducing scythe rods or blanks to plates from which scythes are produced, whether said rods are of steel alone, or of iron and steel combined. The invention consists in a peculiar system of mechanism for automatically and accurately introducing the rod to the die-grooves, and in the method of controlling the position of the gage which determines the point at which the rod shall be seized by the dies; also, in an improved guide for guiding the rod to the action of the roller-dies; also, in a clearer for liberating the plated or partially-plated rod from the grooves; also, in the peculiar shape of the die-grooves relatively to each other, by which rods of various lengths can be fashioned into scythe-plates, varying proportionately in length, in the same suit of grooves; also, in a peculiar form of roller die-groove for fashioning the ends of the scythe-plates from which the rounded points of the scythes are to be formed.

A machine embodying these improvements is represented in the drawings—

Figure 1 showing a front, and Fig. 2 a rear, perspective view of the same. Figs. 3, 4, and 5 show, respectively, a front elevation, a side elevation, and a plan of the guide mechanism.

a a denote the stands or housings; *b b*, the rolls, the lower one of which has a series of die-grooves formed in part of its surface, said grooves acting in conjunction with the corresponding full surface of the upper roll to fashion or shape the rod. The rolls are geared together, and are driven by power applied to a gear, *c*, upon the shaft of the lower roll. *A*

is the guide or guide mechanism for insuring the proper position of the bar or rod during the action of the dies upon it. This guide has a shelf for supporting the rod, two up-rights, between which the rod passes, and lateral-swinging pieces, simultaneously operated upon by the short arms of a bent lever, all substantially the same as in the guide patented by me in United States patent No. 48,466, the short arm of the lever in my present guide being operated to centralize the rod by the weight of the long arm of the same, or by pressure of a hand-lever upon said arm. While this prevents the lateral-swaying movement of the bar and keeps it in line, although it may vary in width, it is desirable to connect therewith a mechanism by which the partially-plated bar, as it is rolled thin, shall be kept from twisting, or, in other words, shall be maintained throughout its progress through the rolls at the proper position, horizontally as well as laterally. For this purpose I hang, at suitable distance above the table, a vertical swing-piece, *e*, turning upon a horizontal shaft, *f*. This swing-piece is operated by an arm, *g*, fixed upon a rocker shaft, *h*, connected to a hand-lever, *i*. By depression of this lever the operator brings the lower arm of the swing-piece *e* down toward the surface of the rod as it passes beneath said swing-piece so that in any tendency to twist it is met by the swing-piece and kept in position thereby, such depression of the lever *i* to carry the swing-piece into position causing the arm *g* to strike against the lever, which operates the lateral guides and holds them up to the rod. Normally the arm is held above the plane of movement of the rod by the action of a spring, *j*, upon the arm *g*. The supporting-shelf and the swing-piece *e* may both have depressions in their surfaces when the shape of the rod may require it.

The mechanism for introducing the bar to the action of the dies is as follows: The outer end of the bar rests upon a shelf, *k*, while its inner end is supported by the guide *A*, its extreme end abutting against a spring-stop, *l*, which extends along the side of the guide, and is bent in behind it, the rod being held against it by a spring-holder, *m*. The stop is pivoted in the guide so that by movement of its outer

end toward the guide its inner end is drawn out from behind the guide to release the rod, which is then thrown forward by the spring-holder *m*. When the rod is so thrown forward the die-rolls are open, and the front end of the rod brings up against the end of a movable guide-bar, *n*, which is operated through a cam upon the gear-wheel *c* to allow the rod to travel forward with the motion of the rolls until the dies bite upon it. The mechanism which connects this guide-bar with the cam, and the mechanism which, acting in connection therewith, operates the stop *l*, are not brought into action by the movement of the rolls alone, but are operated in connection therewith at the will of the operator. The guide-bar *n* is jointed to the top of a rocker-arm, *o*, placed on a slide-shaft, *p*. This shaft is journaled in the housings *a*, and has an arm, *q*, fixed on one end, the upper end of this arm being bent outward, as seen at Fig. 2. The inner side of the gear *c* has a cam, *r*, which, when the shaft *p* is slid toward the gear, strikes the arm *q*, and operates the gage-bar *n*. The shaft *p* is brought into position for the cam to strike upon its arm *q* by a treadle, *s*, acting through a connecting-rod, *t*, upon one arm of a bent lever, *u*, against whose other arm the shaft *p* is held by the action of a suitable spring fixed to the frame *a*, and bearing against the opposite end of the shaft, this spring keeping the treadle in its normal position and the arm *q* out of action with the cam *r*. Another spring, *v*, holds the guide-bar *n* normally in position, and at the same time keeps the arm *q* against a stop, *w*, in position to be thrown forward into the path of the cam *r*. In front of the roller-stand is a horizontal slide-rod, *x*, which is connected with a slide-rod, *y*, at the end of the stand by a bent lever, *z*. The outer end of the rod *y* is operated upon by an arm, *a'*, fixed upon the shaft *p*. The rod *x* carries a tappet, *b'*, so fixed upon the rod that the spring which holds the spring-stop *l*, before referred to, normally in position by contact with the tappet holds the rods *x* and *y* in normal position. Just as or before the guide-bar *n* reaches its most forward position by movement of the shaft *p* the arm *a'* strikes the end of the rod *y*, imparting a slight movement through it to the rod *x* and tappet *b'*, the movement of the tappet *b'* withdrawing the inner end of the spring-stop *l*, which releases the rod or blank, and allows it to be thrust through the rolls until brought up by the face of the guide-bar *n*. The spring-stop is locked in this position by a spring-latch, *c'* slipping over a projection upon the end of the rod *x*. The outer end of the spring-latch when the rod *x* is locked thereby is in position to be struck by a cam-bar, *d'*, on the wheel *c*, which contact unlatches the bar and allows the spring-stop *l* to fly back in front of the guide, and the rod *x* to regain its normal position. The connected operation of the holding, guiding, and introducing mechanism is as follows: The rod is laid upon the shelf or support *k* with its front end in the guide A, and held

against the spring-stop *l* by the holder *m*. The rolls rotate without affecting such position of the rod until the treadle *s* is depressed by the operator. Depression of the treadle communicates an endwise movement to the slide-shaft *p* carrying the bent end of the arm *q* thereof into position to be acted upon by the cam *r*. When the cam strikes the arm it thereby turns the shaft *p* and its arm *o*, and throws the gage-bar *n* forward into position to receive the end of the rod. The movement of the shaft simultaneously throws forward the arm *a'*, which strikes the rod *y* and liberates the blank or rod from its spring-stop *l*, locking the stop in position by the action of the latch *c'*, the liberated rod being pressed forward through the rolls, which are open when the gage-bar is thrown up toward them, and coming in contact with the face of the gage-bar. As the rod strikes the bar, said bar begins to travel back attended by the rod, the spring *v* drawing the gage-bar back, its rate of progress being at the same or about the same speed as the movement of the rolls, this being effected by the form of the cam *r*. The blank or rod thus progresses by the action of the gage-bar and the spring-holder *m* until the dies bite upon its surface. Before the die, after having passed its length upon the rod, again comes into position by rotation to receive the rod for another pass the spring-stop *l* is released by the action of the cam-bar *d'*, and is returned to its position in front of the guide. During the action of the rolls upon the rod the guide mechanism A is operated to maintain the bar in proper form and position relatively to the acting surfaces of the dies, as before explained.

In connection with the rolls I employ a device for liberating the rod from the die as it is impressed thereby. This clearer is composed of one or more plates, *e'*, fixed on the upper arm of a weighted lever, *f'*. As the surface of the under roll—lower than its working surface—is passing the clearer its front edge or edges rests against such surface by the action of the weight. As the full surface of the roll reaches it its edges are elevated by such surface, and passing under the edges of the rod clear it from the die surface, and guide it upon and over the surface of the table *g'*, a suitable stop being provided to prevent the too great elevation of the clearer.

In order to use the same suit of die-grooves for rolling scythe-rods of different lengths, the grooves are peculiarly shaped in relation to each other, the peculiarity consisting in so forming the dies that the rod may be rolled or plated in the successive grooves from the ends of the rod toward the center thereof, the dies leaving the rod near the middle or between the middle and the end, the finishing ends of the dies, excepting the first, being nearly of the same form and dimensions, so that in rolling from the end of the rod or plate toward and up to or upon that portion thereof of previously rolled, the said portions of the

rod shall practically correspond. This will be more clearly understood from reference to Fig. 6 of the drawings, which shows a plan of the working surface of the die-cylinder and grooves reduced to a plane, B denoting the groove for the first pass, C that for the second pass, D the groove for the third pass.

Having the rod in form as represented at E, and properly heated, the procedure is as follows: The operator presents the point end to the first die-groove B of the suit, into which it is introduced in the manner described, and, when the die has passed its length upon it, an assistant behind the rolls immediately withdraws the piece from between the rolls before it shall have been a second time seized by the same die. This brings the piece to the condition represented at B', the first pass having rolled the rod from *h'* to *i'*. A second pass is then similarly made in the second die C of the suit, bringing the piece to the condition represented at C', and rolling it from *k'* to *l'*. The piece is then turned end for end, and a third pass similarly made in the third die D of the suit, thus completing the rolling of the plate to the form as represented at D', the last die having passed upon the same from *m'* to *n'*.

It should be observed that, for the pass at the heel end, the gage must be at a greater distance from the die than for the first two passes, so as to leave that portion of the rod from which the heels are to be afterward formed. Thus it will be readily seen that, by making those ends of the successive dies which roll toward and adjacent to or upon the middle of the rod of the same form, the grooves being of length to roll the longest scythe-plate desired, shorter scythes may be made in the same suit by rolling from the ends toward and upon the middle, or between the middle and the end of the rod, substantially as described.

A separate guide mechanism, gage, and clearer are to be arranged for each die-groove, and the suit of grooves with the mechanism

for each may be mounted in one frame or each in a separate frame, as may be desirable.

The grooves are formed to fashion a scythe-plate for two scythes. The grooves in which the point end of the plate is formed are shown as forked or formed with two grooves for the purpose of producing the rounded ends for the points of the scythes, thus obviating the necessity of bending the same into form, as would have to be done were the point end of the plate rolled with one groove extending straight out to the end.

I claim—

1. A cam for controlling the position of the gage, substantially as described, which gage determines the position of the rod or bar with relation to the rolls, or the point upon the bar in the direction of its length at which the rolls shall bite upon it.

2. The system of mechanism for automatically and accurately introducing the rod to the rolls, substantially as set forth.

3. Combining with the guide or guides, which keep the rod from swaying laterally, a mechanism or device for preventing the rod from twisting.

4. A double system of die-grooves, substantially as described, for rolling the point and heel ends of scythes and similar articles, where the finishing-die grooves for each end of the scythe have substantially the same terminal forms.

5. The process, as described, by which scythe-plates of various lengths may be rolled in the same suit of dies.

6. The forked-roller groove for rolling the points of scythes to obviate the necessity of bending.

In witness whereof I have hereunto set my hand this 7th day of September, A. D. 1865.

HERVEY WATERS.

Witnesses:

J. B. CROSBY,
FRANCIS GOULD.