J. SIMMONS.

Making Axes.

No. 9,601.

2 Sheets—Sheet 1.

Patented March 1, 1853.

Fig. 1.

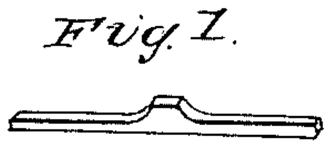
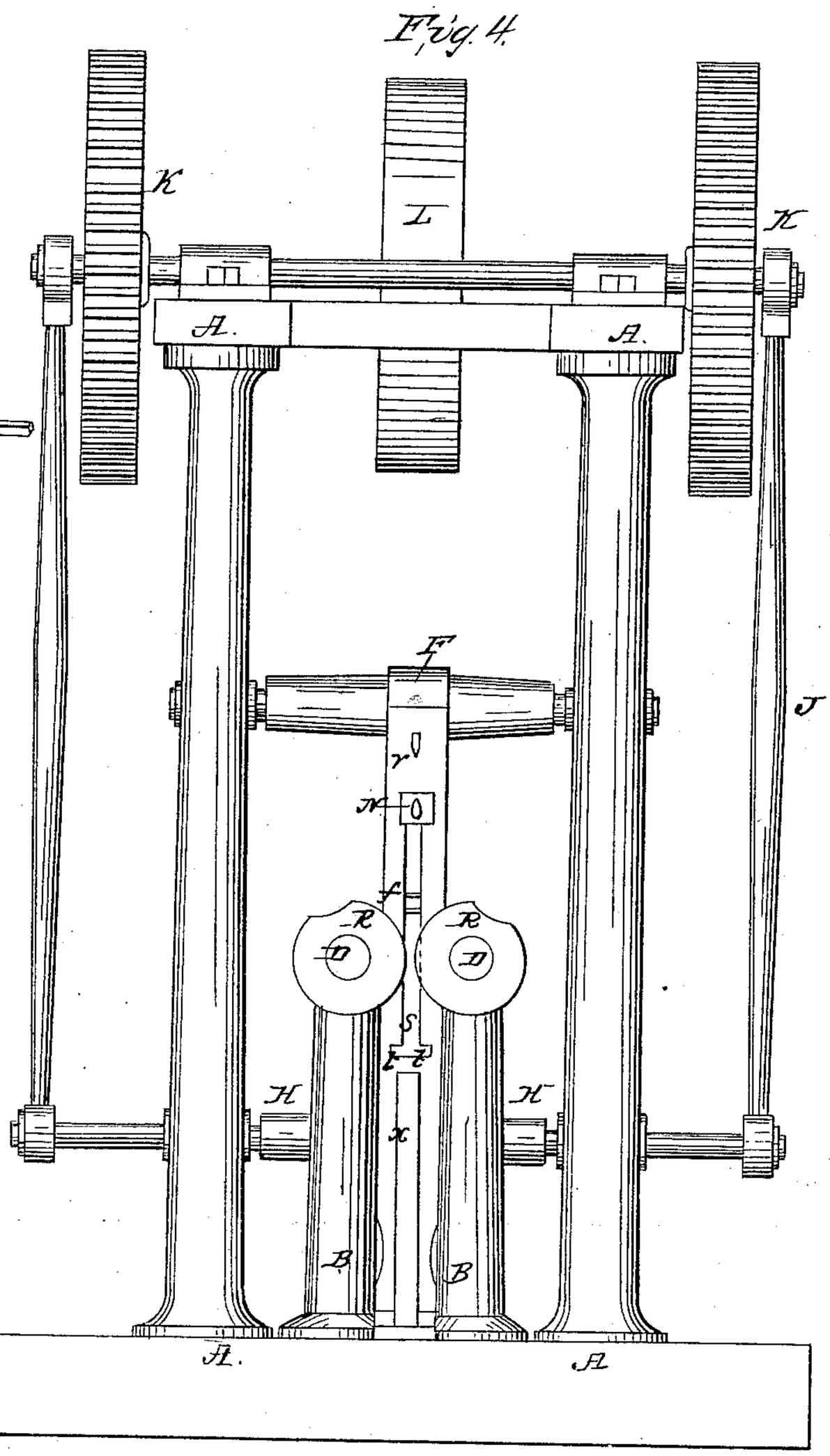


Fig. 2

Fig. 3

Fig. 4



2 Sheets—Sheet 2.

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Fig. 5

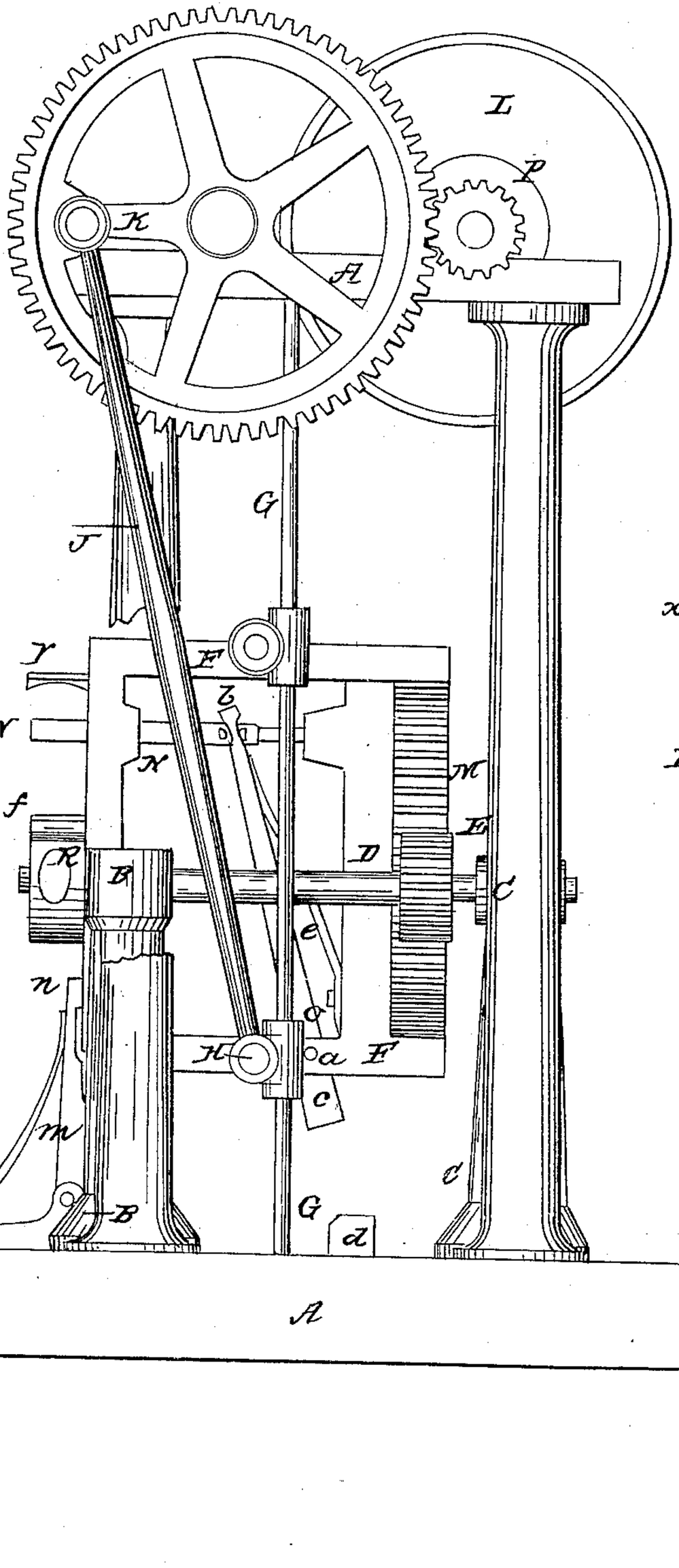


Fig. 6

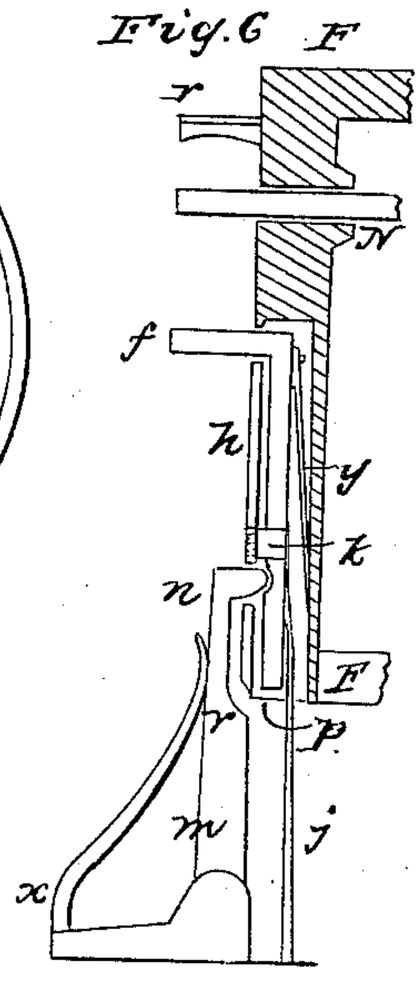


Fig. 7

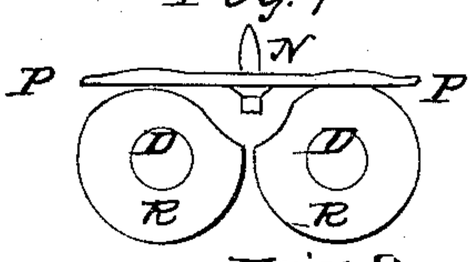


Fig. 8

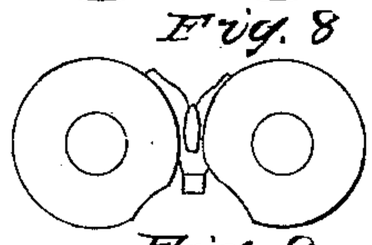


Fig. 9

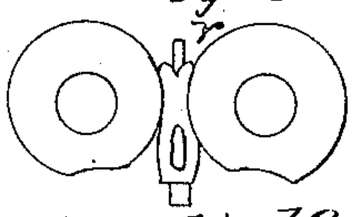
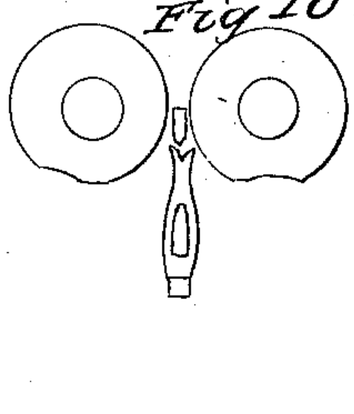


Fig. 10



UNITED STATES PATENT OFFICE.

JONAS SIMMONS, OF COHOES, NEW YORK.

MACHINE FOR MAKING AXES.

Specification of Letters Patent No. 9,601, dated March 1, 1853.

To all whom it may concern:

Be it known that I, JONAS SIMMONS, of Cohoes, Albany county, State of New York, have invented certain Machinery for the Manufacturing of Axes; and I declare the following specification, with the drawings hereto annexed as part of the same, to be a full and complete description thereof.

In the different figures similar letters denote the same parts.

In order to explain the nature and operation of my machinery it will be proper first to explain the ordinary process of ax making. 1st, a piece is cut from a bar of iron of a convenient width and thickness and is forged into the shape represented in perspective in Figure 1, the breadth of the bar being the intended width of the ax, and its thickness a little thicker than the finished blade. 2d, this bar is next bent, into a forked shape as shown in Fig. 2, the ends being brought around and about parallel with each other. 3d, a short piece *z*, from the same bar, or a similar one, is inserted between the forks, filling up the space between them excepting a sufficient portion intended for the eye of the ax, which piece is called the slug. 4th, the iron thus prepared is heated to a welding heat, and the ax shaped by hammering down the sides upon the slug, welding the whole together and finishing the blade preparatory to adding the steel edge, when its shape is as represented in Fig. 3. The whole is done by hand work with the aid of a tilt-hammer for part of the process.

The object of my invention is to accomplish the most difficult part of the process by machinery, and at one operation.

The machinery I employ is represented at Fig. 4 in front view, and at Fig. 5 in profile.

A A A A is a strong iron frame consisting of four uprights or pillars firmly set upon a strong base, and connected at top with a sufficient framing or entablature. Between the front pillars stand two upright standards or short columns B, B; opposite to them and between the rear pillars two similar columns C, C. Two horizontal shafts D, D, pass from the front to the rear through the tops of these columns. On the front ends of these shafts two rolls R R revolve, which will be described hereafter. Between these shafts a square, vertical frame F, F, is placed whose front bar stands between the front columns, with its front face nearly in contact with the back of the rolls R R. This frame is supported in position by two guide rods G (one only of which can be shown) extending from the entablature to the base between the side pillars of the frame. To connect the frame with these rods, cross bars H H extend from its top and bottom and attach by slides. The lowest cross bar is extended beyond the slides, and at its outer extremities, pitmen J, J, connect it with pins near the periphery of crank wheels K K fitted upon a common shaft, by which cranks the frame is moved up and down. The wheels K are toothed and cog into pinion wheels P, on whose common shaft, the drum L is fixed through which motion is communicated to the whole machinery. It is necessary that the rolls should revolve at a rate relative to the movement of the frame F. This is accomplished by the rack M attached to the rear of the frame having teeth facing to both sides of the machine, and cogging into the cog wheels E, (only one of which can be shown), fixed on the shafts D, D.

In the upper part of the frame F a bar N which I call the eye-bar passes through the front bar of the frame, its rear being supported in and by cavity in the rear bar of the same. The outer extremity of this bar N is shaped to act as a mandrel to form the eye of the ax, and the bar slides back from the position shown in the drawing till the mandrel sinks completely into the front bar of the frame. This motion is needed when the frame has descended nearly to the bottom of its career, and is effected by a bar O pivoted on a center at *a* and hinged to N at *b*, and projecting a short distance below the frame F to *c*. As the bar descends with the frame, the point *c* trips on a stop *d* placed on the base of the machine, and is pressed forward, throwing N back. When the bar rises a spring *e* presses N forward again. At *f* is seen another bar projecting from the front of the frame F. This is the rest-bar. It has a vertical motion, up and down, through a slot S in the face of the front bar of the frame. See the sectional profile, Fig. 7, where *f* is shown attached to an upright stem *h* which plays loosely within a cavity in the said front bar.

A spring *j*, that is planted upon the base passes up and into the cavity behind *h* so as to press it strongly forward during the last downward movements of the frame. There is also a spring *y* attached to the

upper part of *h* to keep it (with the rest-bar) from dropping down when the spring *j* has ceased to act, as it does when the frame approaches the upper part of its course. From the sides of *h* project two square shoulders or stops *k*, *k*, which also project a little to the front. They are intended as *h* moves within the cavity to enter into two side necks, shown in Fig. 4 at *t t*, by the pressure of the spring *j*, and thus make the rest-bar move with the frame F as part thereof. This is done excepting at such time as *h* is pressed back against the spring, which is done during part of the movement by the detent *m*, which is pivoted upon the base of the machine, and has its upper end *n* fashioned so as to traverse the slot S, and the point thereof to enter a notch in *h* so as to hold the rest-bar stationary while the frame F moves, a strong spring *x* keeping *n* in the notch. The point of *n* is thrown out of the notch by the pressure of the lower point *p* of the frame upon a projection *r* near the heel of *m*. Above the eye-bar is another projecting bar *r* called the scarfing-bar, the object of which is to keep separate the upper ends of the bar, as it passes through the rolls, into two scarfs, within which to insert the steel piece to form the edge of the ax.

The faces of the rolls R, R, are symmetrically similar, the cylindrical continuity of their faces, being cut away for a portion of their surfaces, in such manner that an ax being passed between them every part of its surface would touch but not press upon their faces, thus forming their faces into dies, shaped to produce by rolling an ax without its steel edge. The profile of the rolls would be such as shown in Figs. 4, 7, 8 9 and 10.

Having described the apparatus I proceed to describe the process of manufacturing the ax. A bar of iron is forged of the shape shown by *p*, *p*, in Fig. 7 of the proper width for the ax but somewhat thicker than would be necessary if the work was to be completed under the hammer. The rolls being placed in the position shown by Fig. 7 the bar *p*, *p*, heated to a welding heat is laid on the rolls, with its center supported by the rest-bar *f* with the eye bar N lying above it. The machine being now put into operation the frame F moves downward, turning the rolls inwardly toward each other, the bars *f* and N carrying down between them the bar the iron closing around the eye-bar as shown in Figs. 8 and 9 and having its edges kept separate by the scarfing bar *r*. As the frame progresses downward the bottom *c* of lever O tripping against the stop *d* draws the eye-bar out from the eye of the ax as shown in Fig. 10 when the ax falls from the rest-bar just as the frame F ceases to move downward. The motion of the frame is now reversed and it goes upward until the rest-bar *f* has reached its position again as shown in Figs. 4 and 5. When the frame reaches this point, the detent *n* which has been kept back by the pressure of the lower extremity of the frame at *p*, drops into its notch in *h*, and holds the rest-bar *f* still while the eye bar N goes up with the frame, and then descends with the frame again. The object in permitting the eye-bar to move up while the rest-bar stands still, is to allow time and space to lay a fresh ax bar in place of the one just made into an ax. As soon as the frame descends low enough to bring the bars into position, as shown in Fig. 7 in which they grip the ax bar as in a vise between them, the lower point *f* of the frame pressing at *r* throws the detent *m* out of the notch at *n*, when the spring *j* forces the bar *h* forward, with the stops *k*, *k*, into the side-nicks *t*, *t*, so that the frame in its farther downward course, carries the rest-bar and eye-bar, down together with the ax-bar between them through the rolls, as above described, till the ax is dropped from the rest-bar.

It will be noted that as the lever O ascends with the frame F, and its lower extremity is released from the pressure of the stop *d* the spring *e* forces the eye-bar out for service.

I do not claim the employment of rolling dies for shaping an ax, but—

I claim—

The arrangement of the devices above mentioned, for making axes: viz., rolling dies with a rest bar to support the iron while being rolled, and an eye bar, arranged not only to serve as a mandrel to shape the eye of the ax, but with the rest-bar to hold the iron firm during the process of rolling, the rest bar and eye bar being connected with the machinery to give them appropriate movements to cause them to coöperate with the rolls in shaping the ax, and these parts further in combination with a scarfing bar for the purpose of shaping the blade to receive the steel point, in order to complete the ax, substantially as the same is set forth in the within specification.

JONAS SIMMONS.

Witnesses:
PAUL PARISH DE WITT,
DE WITT C. DE FOREST.