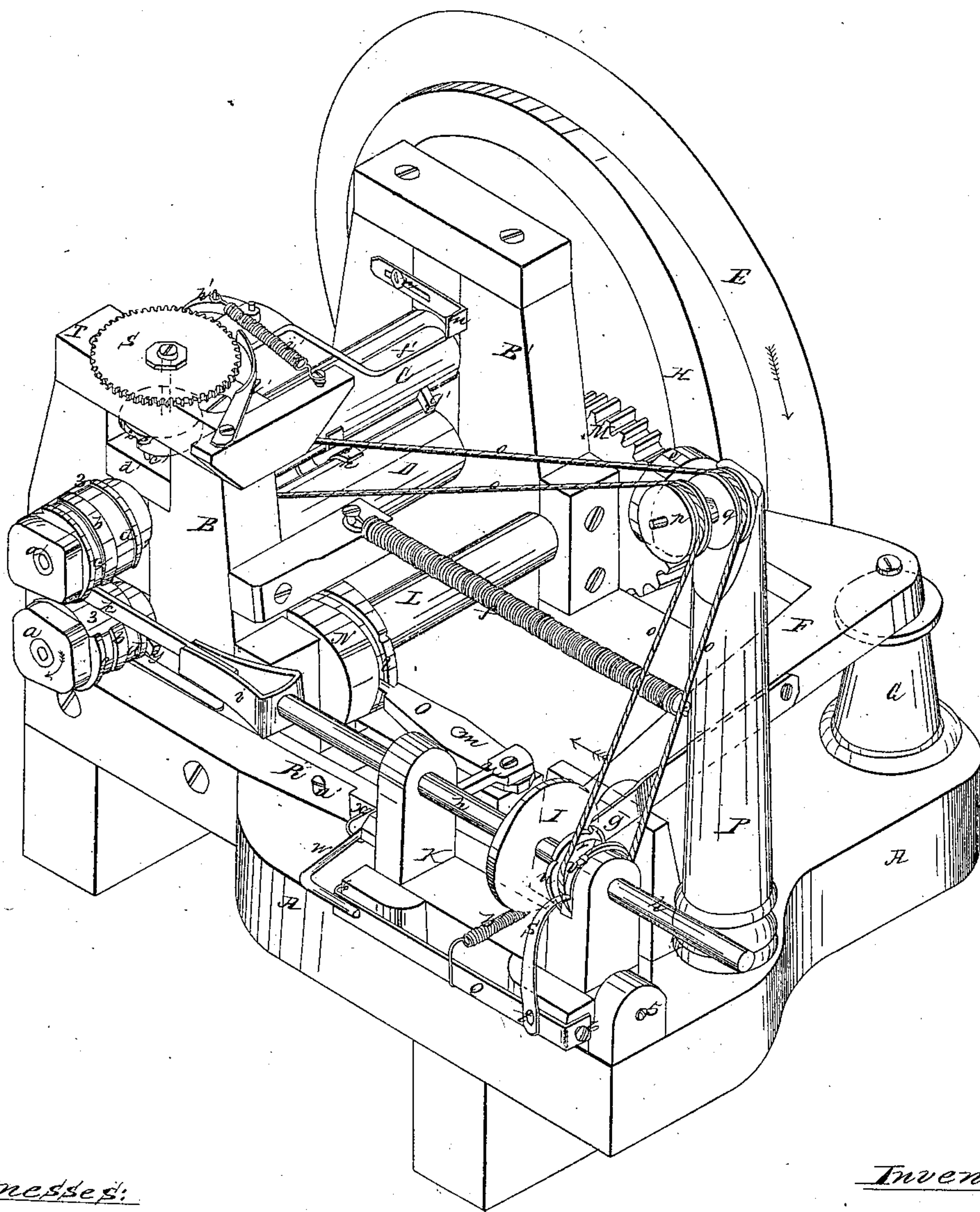


*M.D. Whipple,*  
*Rolling File Blanks.*

*N<sup>o</sup> 42,981.*

*Patented May 31, 1864.*



*Witnesses:*

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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN MACHINES FOR ROLLING FILE-BLANKS.

Specification forming part of Letters Patent No. 42,981, dated May 31, 1864.

*To all whom it may concern:*

Be it known that I, MILTON D. WHIPPLE, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented certain Improvements in Machines for Rolling and Forging Articles of Metal, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, in which is represented a machine for rolling file-blanks, having my improvements attached.

In the attempts heretofore made to fashion articles of irregular form by rolling, if they varied considerably at different points either in width or thickness, the metal was liable to be crushed by the too abrupt and sudden change of form to which it was subjected while passing once through the rolls, by which its integrity was destroyed and the strength of the articles impaired.

To remedy this defect is the object of my present invention, which consists in subjecting the article a number of times in quick succession to the action in the rolls, which are brought nearer and nearer together as the operation proceeds, so as gradually to change the form of the metal, and ultimately bring it to the shape required without submitting it at any point to abrupt or sudden change and without injury to the texture of the metal.

The machine represented in the accompanying drawing, which is contrived for rolling blanks for files, will serve to illustrate the manner in which I have carried out my invention.

From the bed A of the machine rise the housings B B' in suitable bearings, in which run the rolls C and D, to which are attached, by screw-nuts *a* or otherwise, the rollers *b*, which carry the grooves necessary to give the required form to the article to be rolled. In the present machine, which is designed for rolling blanks for flat files, two grooves are required, the one, *c*, for rolling the edge of the file, and the other, *d*, for rolling its flat side. The rolls C and D are geared together in the ordinary manner, and to the lower one, D, is secured the fly-wheel E and a driving-pulley, the latter not being shown in the drawing.

In the manufacture of blanks for flat files, the flat sides and the edges of the blanks require to be subjected alternately to the action of the rolls, and to this end it becomes neces-

sary to shift the blank from one groove to the other, and to turn it over so as to roll first the sides and then the edges, and this is effected in the following manner: A bent lever, F, pivoted to a short standard, G, carries upon the end of its shorter arm a roller, *e*, which bears constantly against the face of a cam, H, on the fly-wheel E, being borne up against the cam by a spiral spring, *f*. The other extremity of the lever F carries a pair of fingers, one side of which is formed by the flat spring *g*. The fingers thus formed by the end of the lever and the spring *g* embrace a disk, I, which is secured to a rod, *h*, that slides freely in standards rising from a frame, K, which is pivoted to the bed of the machine at 5. The rod *h* is also permitted to revolve in the standard, and to its forward end is secured the blank-holder or tongs *i*, the sides of which are sprung apart for the insertion of the blank *k*, and thus as the lever F is drawn in the direction of the arrow by the spring *f*, the rod *h* is moved forward and the file-blank is entered between the rolls, a portion of the circumference of which is left cylindrical, as seen at 3, against which the end of the blank rests until the proper time arrives in the revolution of the rolls for the insertion of the blank in the groove *c*. The blank thus inserted is immediately rolled out by the rolls, the cam H being so formed as to withdraw the rod *h* and holder *i* at the same time, the spring *g* yielding, should the rolls pass out the blank faster than would be allowed by the cam H. As soon as the blank leaves the groove *c*, in which its edge is rolled, it is vibrated opposite to the groove *d*, in which its flat side is formed in the following manner: To one end of a shaft, L, running in bearings in the frame-work, is secured a gear, M, that engages with a similar wheel (not shown upon the drawing) on the shaft of the lower roll, D. To the other end of this shaft L is secured the wheel N, having a cam-groove, *l*, cut in its face, in which works the end of a lever, O, pivoted at *m* to a block rising from the bed A. To the other end of this lever is pivoted the rod *n*, which is attached to the vibrating frame K, to which is allowed a slight motion in a horizontal plane around the pivot, and thus, as the wheel N is revolved, the frame K, carrying the rod *h* and file-holder *i*, is vibrated as required to bring the blank alternately opposite to the grooves *c* or *d*. The blank is turned, in



order to present its edge or flat side, as may be necessary, to the rolls in the following manner: An endless band, *o*, from the upper roll, *C*, passes over two guide-pulleys, *p q*, which run on a short shaft projecting from the post *P*, and thence over a pulley, *r*, on the rod *h*, which is thus caused to revolve with the roll *C*, when not prevented from so doing by means which will be presently described. The pulley *r* is attached to the rod *h* by a spline and feather, so that while the two revolve together the rod can play longitudinally through the pulley.

It is obvious that the rod *h* should only be allowed to revolve at intervals, or while the blank is being vibrated from one groove to the other. At other times it is held from revolving by the following device: The pulley *r* has a series of notches, *u v*, cut in its periphery, against which rests a spring-pawl, *s*, which is secured at *t* to the flat bar *Q*. This bar is pivoted to the frame *K* at *6*, and is rocked for the purpose of disengaging the pawl *s* from the notches in the pulley *r* by the bent rod *w*, projecting from it. This rod rests against a bent pin, *x*, on the end of a lever, *R*, which is pivoted to the frame-work at *a'*, and is depressed by a pin, *y*, on the lower roll, *D*, and thus the bar *Q* is rocked and the pawl *s* disengaged from the notches in the pulley *r*, which is then free to be revolved by the band *o*. As soon, however, as the pin *y* has passed the end of the lever, the bar *Q* is returned to its place by the spring *b'*, and the pawl *s* enters the next notch and holds the pulley stationary, as required, while the blank is being rolled, the band *o* slipping upon the pulley. The pawl *s* may be moved to engage either with the notches *u* or *v*. When flat or square files are rolled, four notches are employed, so as to arrest the blank after each quarter-revolution. When "three-square" files are to be rolled, three notches are required, that the blank may be arrested after each third of a revolution. In general, the number of the notches in the pulley *r* may be varied to suit the form of the article to be rolled. When three-square files, round files, or other articles of symmetrical form are rolled, the cam-wheel *N* and the parts connected therewith for the purpose of vibrating the frame *K* may be dispensed with. In such case the collars *b* may be replaced by one having a single groove corresponding in form to that of the article to be rolled. The rolls *C* and *D* are forced apart by the spring *k'*, and are caused gradually to approach each other, as the rolling proceeds, by the following device: The end of the roll *C* nearest the groove is allowed a slight vertical motion in the housing *B*. Upon this roll rests a block, *d'*, from which rises a pin, *e'*. *S* is a ratchet-wheel secured to the end of a vertical shaft which passes through the cross-piece *T*, and carries

at its lower end a cam-wheel, *e'*, of the form represented in the drawing. *f'* is a bent lever pivoted to the cross-piece *T*, which projects down into the path of the pin *g'* on the roll *C*. To the lever *f'* is pivoted a pawl, *h'*, which is caused to engage with the teeth of the wheel *S* by a spring, *i'*, the pawl *h'* holding the wheel *S* from turning in the wrong direction, and thus as the roll *C* revolves it is gradually forced down by the cam *e'*, as required, until the pin *e'* reaches the point 1 on the cam-wheel *e'*, when the pin rises into the depression 2, the rolls being pressed apart by their spring *k'*. The end of the lever *f'* strikes against the end of a gage, *m'*, which is adjusted by a screw and slot, *n'*, so as to regulate the amount of motion of the wheel *S* at each movement of the lever *f'*. When the collars *b* on the ends of the rolls *C* and *D* are pressed close together by the cam-wheel *e'*, the spaces formed by the grooves *c* and *d* correspond exactly to the form of the finished blank. The machine being started in the direction of the arrows, a blank or piece of heated metal of the proper size is inserted in the tongs *i*, and on the rolls *C* and *D* springing apart, the cam *H* permits the spring *f* to insert the blank between the rolls. The upper roll is now brought down by the action of the pin *g'* and cam *e'*, as explained, and the blank is rolled out, having been slightly compressed in one direction. The blank is now held clear of the rolls by the cam *H*, and the next instant, by the revolution of the pin *y*, the pawl *s* is disengaged from the notch in the pulley *r*, and the blank is caused to make a quarter-revolution. At the same time by means of the cam-wheel *N* the blank is brought opposite to the other groove in the rolls *C D*, and between which it is inserted by the spring *f*, and is again rolled out as before, the rolls *C* and *D* being caused to approach nearer and nearer to each other each time they operate upon the blank until they are brought into the final position necessary to give the required form to the article. A fresh blank is then inserted and the operation continued as before.

It is obvious that the machine above described may be adapted to rolling other articles besides file-blanks, and I do not confine myself to any precise details herein described.

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

The movable tongs *i*, and a mechanism, substantially as described, for operating and governing the same, in combination with the rolls *C* and *D*, operating in the manner substantially as set forth.

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Witnesses:

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P. E. TESCHEMACHER.