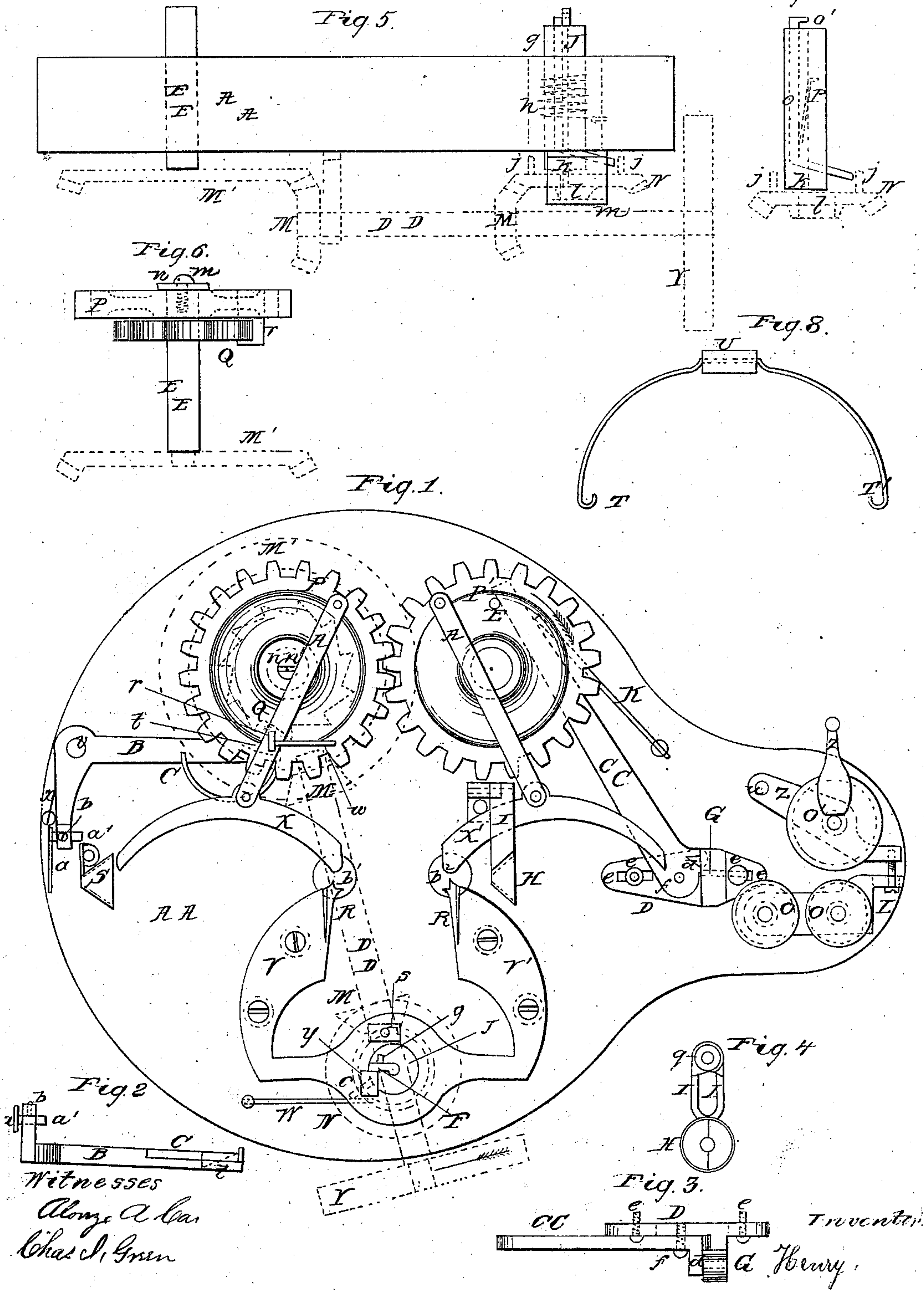


H. C. Wilder, Making Bails.

No. 81,447.

Patented Aug. 25, 1868.



Witnesses
Along A. Can.
Chas. J. Green

United States Patent Office.

HENRY C. WILDER, OF ASHBY, MASSACHUSETTS.

Letters Patent No. 81,447, dated August 25, 1868; antedated August 13, 1868.

IMPROVED BAIL-MAKING MACHINE.

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, HENRY C. WILDER, of Ashby, in the county of Middlesex, and State of Massachusetts, have invented a new and useful Machine for Making Bails, called "Wilder's Automatic Bail-Machine;" and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a top view. The black lines represent the parts above the bed-piece, and the red lines show the relative position of the parts below the bed-piece.

Figure 2 is an edge view of the bent lever, B. *a a'* is the gauge and its shank, *b* the set-screw, C the spring-stop, and *t* the incline.

Figure 3 is an edge view of the cutter-plate D and the lever C C. *f* is the pivot, G the hardened-steel ring, *d* the hardened-steel cutter, and *e e* are the fastening-screws.

Figure 4 is a view of the tunnel H and the hinged levers I I. *q* is the spiral spring.

Figure 5 is a horizontal end view, representing the bed-piece A A, the vibrating shaft J, the rotating shafts D D, E E, the gears *m' m m n*, the hardened-steel die F, the lever *g*, the spring *h*, the arm *i*, the pins *j j*, the pivots *k l*, the hanger *m*, and the pulley *y*.

Figure 6 is an edge view, representing the bevelled gear *m'*, the spur-gear P, the washer and screw *n n'*, the shaft E E, the ratchet-wheel Q, and the catch *i* dropped between its notches.

Figure 7 is a view representing the vibrating shaft J, the lever *g*, and its projection, *o'*, the pivot *o*, the spring *p*, the arm *i*, the pivots *k l*, the pins *j j*, and the gear *n*.

Figure 8 represents a bail.

U is the bail-wood, and T T' the hooks.

The edge of the spring-stop C (fig. 2) projects above the highest point of the incline *t*, against which the catch *i* (fig. 6) is brought by the rotation of the gear P. The catch *i* passes freely through the gear P, and so far from its centre that when it is forced down by the spring *w*, (fig. 1,) a part of its width falls without the circumference of the ratchet-wheel Q, which is firmly secured to the shaft E E, (fig. 6,) and revolved with it.

The gear P is fitted loosely to the shaft E E, but, when the shaft E E revolves, the friction of the ratchet-wheel Q and the washer *n*, which is regulated by the screw *n'*, is sufficient to hold the catch *i* against the spring-stop C, (figs. 1 and 2.)

The bent lever B (fig. 1) is free to vibrate upon the pivot *v* just enough to remove the spring-stop C and incline *t* from contact with the catch *i*, and is held in position by the spring *x*, when not working, as hereafter described.

The gauge *a* is adjusted by its shank, *a'*, and is secured by the set-screw *b*. The vibrating arms X X', being supported by the pivots *b' b''*, are free to vibrate.

The cutter-plate D is adjusted by the fastening-screws *e e* passing through the slots *e e*, and supports the hardened-steel ring G and the lever C C, which is free to vibrate upon the pivot *f*, and is held in position by the spring *k*, when not working, as hereafter described.

The tunnel H, (fig. 4,) being in sections, which are attached to the levers I I, one of which rests above and the other below the arm X', (fig. 1,) is held together by the spring *q*, (fig. 4,) when not working, as hereafter described.

The stationary tunnel S (fig. 1) is slotted through the side nearest the former V. The grooved roll O', being supported by the lever Z, which is free to vibrate upon the pivot *u*, is adjusted by the screw L.

The hanger *m* (fig. 5) supports the pivot *l*, upon which the gear *n* revolves. The pivot *k*, (figs. 5 and 7,) which supports the lower end of the vibrating shaft J, rests in a socket within the circumference of the pivot *l*, but not in its centre. The lever *g* is secured in a slot running lengthwise of the vibrating shaft J by the pivot *o*, upon which it is free to vibrate. The spring *p* presses back the lever *g*, when not working, as hereafter described, so as to hold the projection *o'* in the hardened-steel die F, and the arm *i*, being attached to its lower

end, is drawn into the vibrating shaft J, so that a circle scribed by its outer end cannot intersect the circle scribed by the pins *j j*.

The arm *e* (fig. 1) is firmly attached to the vibrating shaft J, near its upper end, and vibrates with it.

One end of the spiral spring *h* (fig. 5) is attached to the bed-piece A A, and the other to the vibrating shaft J, which, when not working, as hereafter described, is thereby turned, so as to hold the arm *e* (fig. 1) against the spring-stop W. The centre of the circular edge of the die F is concentric with the vibrating shaft J, to the upper end of which it is firmly attached, and vibrates with it. The die F has a circular opening through it, upon a level with the upper end of the vibrating shaft J, sufficiently large to freely receive a bail-wire. The front side of the die F has the corner of the circular opening rounded, so that the bail-wire is more readily thrust into it, but the back side has its corner sharp, so as to catch the end of the bail-wire, and prevent its slipping from the die while being hooked, as hereafter described.

The guide *y* is secured in position just in front of the die F, and, with the end of the vibrating shaft J, forms a right-angled corner, which serves to guide the bail-wire into the die F.

To explain the operation of my invention, suppose power applied to the pulley Y, (figs. 1 and 5,) giving continuous rotation to the shafts D D, E E, the gears *n m m'*, and the washer and screw *n n'*, while all other parts remain at rest, except as hereafter described. Having placed a skein of bail-wire upon a reel, at a convenient distance from the machine, pass one end between the grooved rolls O O O', (fig. 1,) then, with the left hand, place a bail-wood longitudinally between the spring-supports R R, and with the right hand turn the crank *z*, when the action of the grooved rolls O O O' will draw the wire from the reel, straighten and pass it through the ring G to the tunnel H, which will guide it through the bail-wood to the tunnel S, which will guide it to the gauge *a*, which is pressed back by the wire just enough to move the incline *t* from under the outer edge of the catch *r*, (figs. 1 and 6,) which is, by the spring *w*, forced down between the notches of the ratchet-wheel Q.

The connection thus effected with the continuous rotating parts, revolves the gears P P in the direction indicated by the arrows thereon.

The cutter *d* (figs. 1 and 3) is, by the action of the pin E against the lever C C, forced against the wire, close to the ring G, so as to cut it in two.

During the cutting of the wire, the position of the arms X X' is not essentially changed, but as the gears P P' (fig. 1) continue to revolve, the connections A A receive a forward motion, closing the arms X X', so as to bend the wire upon the spring-supports R R and around the formers V V'.

The bail-wood U (fig. 8) is, for convenience, a little shorter than the distance between the spring-supports R R, (fig. 1,) but, as the wire is bent upon them, they are pressed firmly against its ends.

As the wire passes from contact with the gauge *a*, the incline *t* and spring-stop C (figs. 1 and 2) are, by the spring *x*, returned to their former position, close to the ratchet-wheel Q.

The wire is fed from the tunnel H, (figs. 1 and 4,) as the pressure of the arm X' against the bevels upon the levers I I separates its sections.

As the revolution of the gears P P' is continued, (fig. 1,) the arms X X' are drawn back, the tunnel H closed, and the catch *r* (figs. 2 and 6) raised above the ratchet-wheel Q, by its outer edge sliding upon the incline *t*, (figs. 1 and 2,) which breaks the connection with the continuous rotating parts, so that the gears P P', the arms X X', and other parts remain in the position shown by fig. 1 until another length of wire sufficient to make a bail is forced against the gauge *a*, as before described.

For convenience, I shall call the partially-formed bail, wire, the ends of which, being successively thrust into the die F, (figs. 1 and 5,) are hooked, as shown by fig. 8 at T T'. As the wire enters the die F, the lever *g* (figs. 1, 5, and 7) is pressed back, which extends the arm *i* from the shaft J, so that a contact with either one of the pins *j j* turns it half way round, and, as it turns, the wire being in contact with the guide *y*, (fig. 1,) is bent around the circular edge of the die F.

The range of contact with the pins *j j*, (figs. 5 and 7,) resulting from the eccentricity of the shaft J with the gear *n*, is passed by the arm *i* when the shaft J has made a half revolution, and the strain of bending the wire ceases, so that, by a continuance of the thrust which places the wire in the die F, it is removed therefrom to the incline *s*, (fig. 1,) which raises it above and free from the guide *y*.

As the wire passes from the die F, the spring *p* (fig. 7) returns the lever *g* to its former position, drawing in the arm *i*, so that it cannot catch against the pins *j j* while, with the shaft J, it is by the spring *h* (fig. 5) being carried back to its former position.

The arm *e*, (fig. 1,) resting against the spring-stop W, causes the shaft J and its attachments to remain in the position shown by fig. 1 until another wire is thrust into the die F, as before described.

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

1. The spring-supports R R, so arranged with formers V V' and vibrating arms X X', or their equivalents, as to receive the pressure of the wire at the ends of the bail-wood, while being bent, as described, and for the purpose specified.

2. The vibrating shaft J, the lever *g*, and the hardened-steel die F, with the guide thereto, combined and operating as described, and for the purpose set forth.

3. The opening-tunnel H, so arranged with other necessary parts as to guide the bail-wire through the bail-wood, in combination with the stationary slotted tunnel S, constructed substantially as described, and for the purpose set forth.

4. The arrangement and combination of the bent lever B with the pivot *e*, the spring *x*, the spring-stop C, the incline *t*, the adjustable gauge *a*, and the set-screw *b*, constructed and operating substantially as described, and for the purpose set forth.

5. The arrangement and combination of the spur-gears P P', the washer and screw *n n'*, the connections A A, the catch *r*, the spring W, and the ratchet-wheel Q, constructed and operating substantially as and for the purpose set forth.

6. The arrangement and combination of the shaft D D, the gears *m n*, the pins *j j*, or their equivalent, with the lever *g* and vibrating shaft J, operating substantially as and for the purpose set forth.

7. The arrangement and combination of the lever *g*, the spring *p*, the arms *e i*, the spring *h*, the shaft J, and the spring W, operating substantially as and for the purpose set forth.

8. The arrangement and combination of the adjustable cutter-plate D, the hardened-steel ring G, the hardened-steel cutter *d*, the lever C C, the pin E, and the spring K, operating substantially as and for the purpose set forth.

9. The arrangement and combination of the crank *z*, the grooved rolls O O O', the pivoted lever Z, or its equivalent, and the adjusting-screw L, operating substantially as and for the purpose set forth.

10. The plate having thereon the guide *y* and the incline *s*, in combination with the vibrating shaft J, having the steel die F thereon, operating as and for the purpose set forth.

11. The construction, combination, and arrangement of all the parts, substantially as described, and for the purpose specified.

HENRY C. WILDER.

Witnesses:

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