3 Sheets--Sheet 1.

M. BRAY.

Riveting-Machine.

No. 161,660. Patented April 6, 1875.

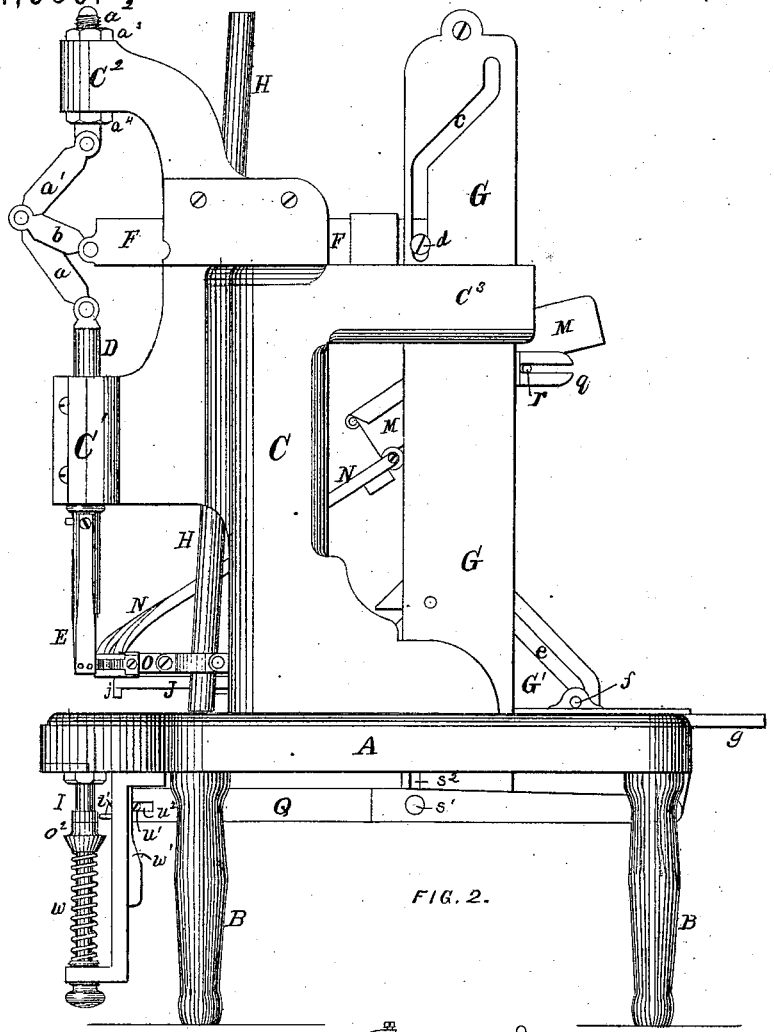

FIG. 2.

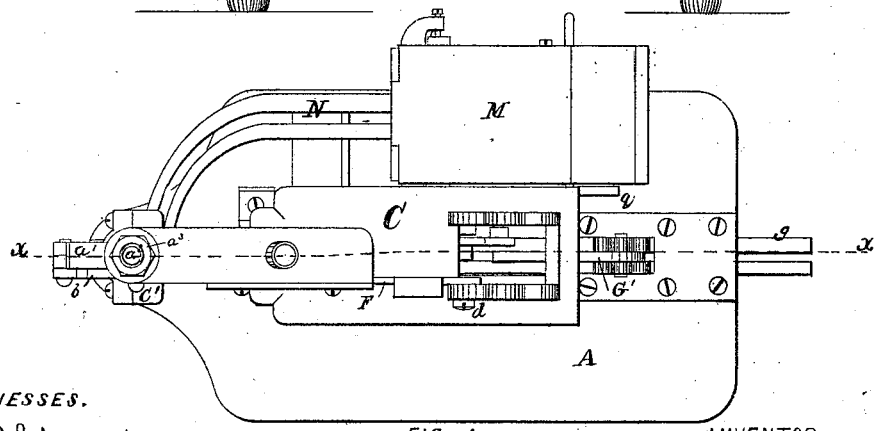

FIG. 1.

WITNESSES.

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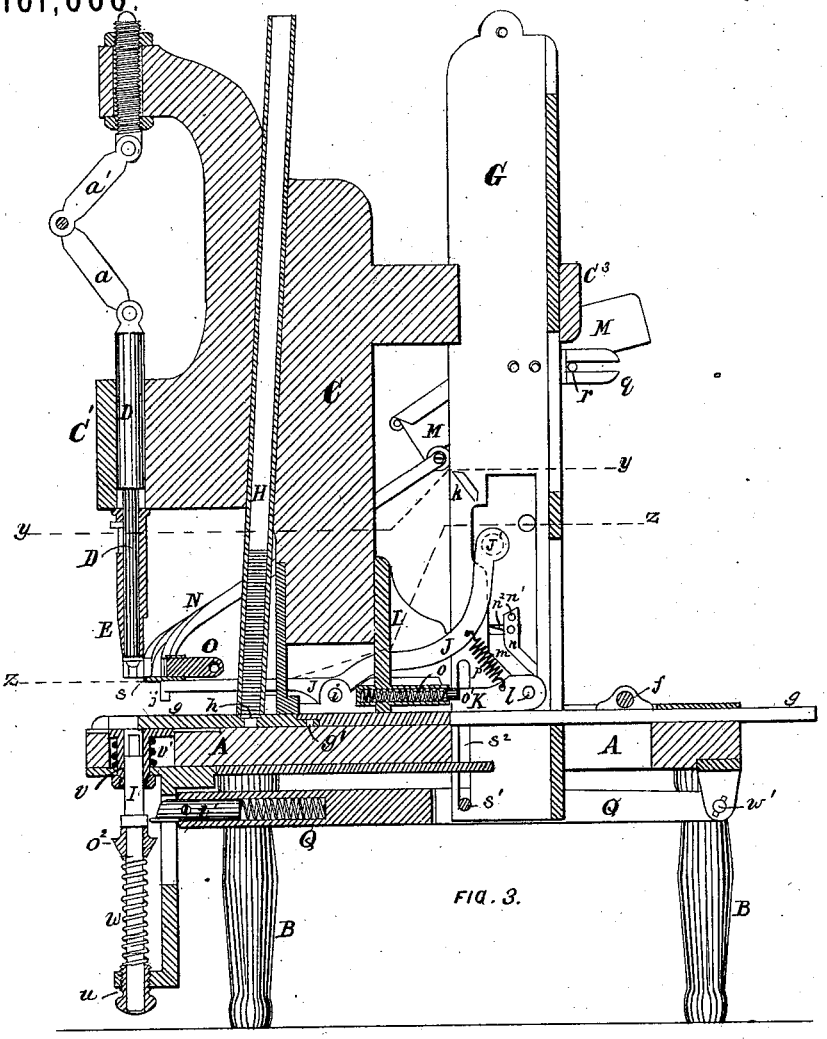

FIG. 3.

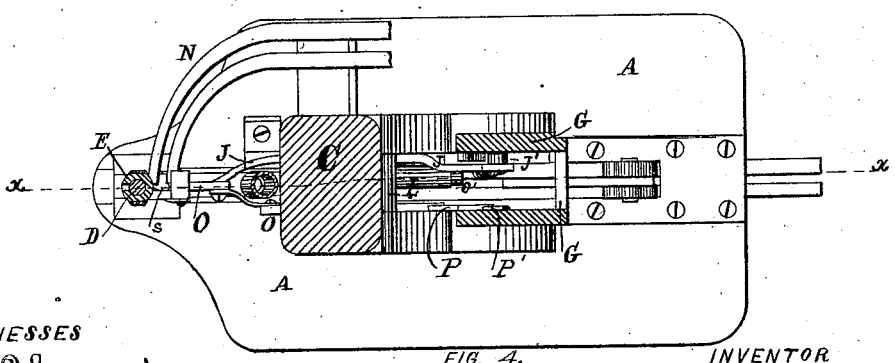

FIG. 4.

WITNESSES

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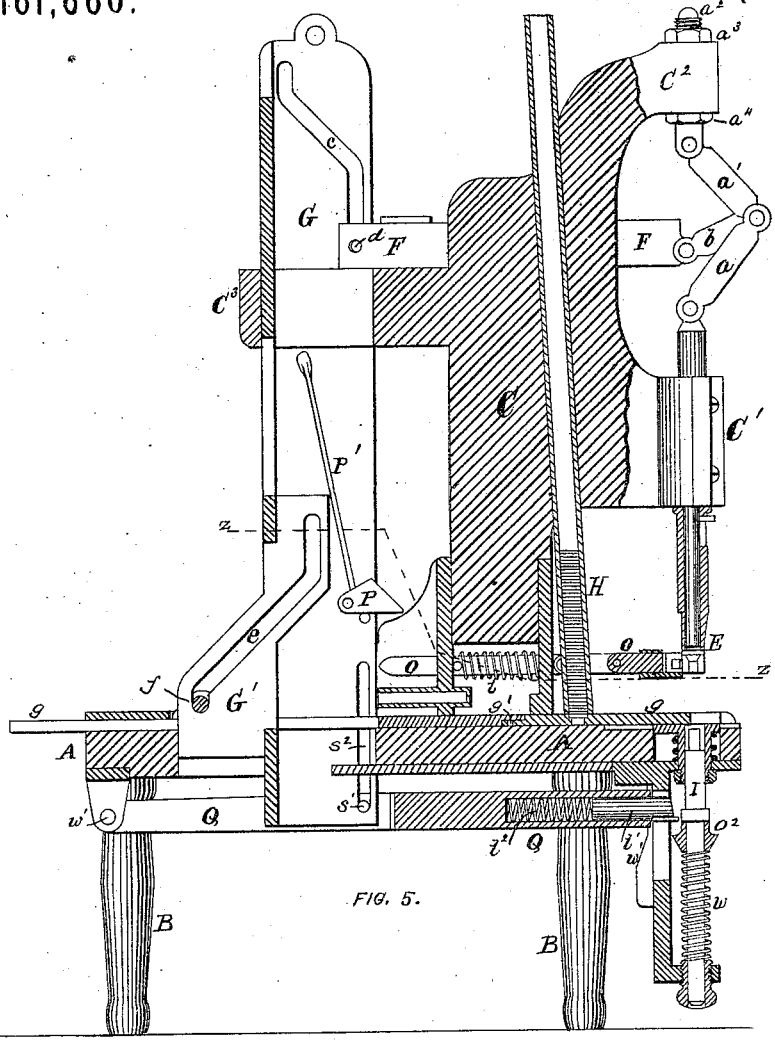

FIG. 5.

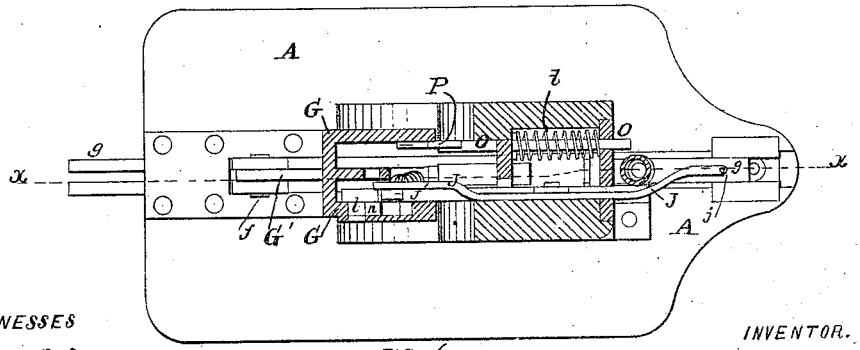

FIG. 6.

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UNITED STATES PATENT OFFICE.

MELLEN BRAY, OF NEWTON, MASSACHUSETTS.

IMPROVEMENT IN RIVETING-MACHINES.

Specification forming part of Letters Patent No. **161,660**, dated April 6, 1875; application filed February 19, 1875.

CASE B.

To all whom it may concern:

Be it known that I, MELLEN BRAY, of Newton, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Riveting-Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to a machine for riveting together pieces of leather, paper, cloth, or other thin sheet material by automatically punching the material, inserting therein an ordinary solid rivet, placing a burr or washer over the end of said rivet, and heading said rivet down upon the burr; and it consists in the combination and arrangements of certain devices whereby the several operations of punching the material, separating and feeding to the work in regular order the rivets and burrs, inserting the rivet through the material and the burr, and heading the rivet are accomplished with rapidity and accuracy, the details of which will be best understood in connection with the description of the drawings, of which—

Figure 1 is a plan of a machine embodying my improvements. Fig. 2 is a side elevation. Fig. 3 is a vertical section on line *x x* on Figs. 1, 4, and 6, looking toward the hopper. Fig. 4 is a horizontal section on line *y y* on Fig. 3. Fig. 5 is a vertical section on line *x x*, looking in the opposite direction to Fig. 3; and Fig. 6 is a horizontal section on line *z z* on Figs. 3 and 5.

A is the table or bed of the machine, supported upon the legs B B, which may be of suitable height to bring the upper surface of the table at a convenient elevation for the operator. C is a frame rising from the upper surface of the table A, and provided with the bearings C^1, C^2, and C^3. D is the setting-plunger, fitted to move up and down in the bearing C^1, and having mounted upon its lower end the rivet-receiver E, constructed and arranged substantially as described in a prior application bearing date January 12, 1875. The plunger D has a reciprocating motion imparted to it by the action of the toggle-links $a\ a^1$, operated by the bar F, connected thereto by the link *b*, and mounted in a suitable bearing in the frame C, in which it is made to reciprocate by the cam-slot *c*, formed in the side of the operating-bar G, acting upon a pin or truck, *d*, secured to said bar F. The upper end of the toggle-link a^1 is connected to the threaded bolt a^2, fitted to the bearing C^2, in which it may be adjusted by means of the nuts a^3 and a^4, for the purpose of adjusting the plunger D to different thicknesses of work. The operating-bar G is made somewhat in the form of a rectangular tube with one side removed, and is mounted in the bearing C^3 of the frame C and a similar bearing in the table A, in which it is made to move up and down by means of a treadle placed near the floor and a suitable link leading therefrom to the lower end of said bar G, said treadle and link not being shown in the drawings. The bar G is also provided with the central plate or rib G′ near its lower end, in which is formed the cam-slot *e*, which, acting upon the pin *f*, causes an intermittent reciprocating motion to be imparted to carrier-bar *g*, which is fitted to a suitable bearing in the table A, with its upper surface flush with the upper surface of the table. The carrier-bar *g* is made in two parts, connected together by the vertical pin *g′*, and has formed in its upper surface a recess, *h*, of proper form and depth to receive one of the burrs or washers contained in the tube H, and also in the center of the recess *h* a hole through said bar, through which the riveting-hammer I passes to head the rivet, when the carrier-bar *g* has been moved forward till the recess *h* is directly in line with the plunger D and riveting-hammer I. J is a lever, pivoted, at *i*, to the bar K, and carrying in its forward end the tubular punch *j*, arranged to cut onto the forward portion of the bar *g*, which is made of soft metal for that purpose. The lever J is provided at its rear end with a truck, J′, upon which the wedge or inclined lug *k* acts to force the punch *j* through the material when the lever J has been moved forward into the proper position by the descent of the operating-bar G. The bar K, to which the lever J is pivoted, is fitted to suitable bearings in the upper surface of the table or the frame C, and is provided with a projecting pin, *l*, at

its rear end, which fits into the inclined slot m, the upper side of which is formed by the side of the rib n, pivoted to the bar G at n^1, and held in position by the spring n^2. The bar K is retracted, after being moved forward, by the spring o acting upon a lug, o^1, formed upon the side of K, said spring being inclosed in a tube attached to the stand L. The punch j is drawn out of the material, after being forced through it, by the spring p. M is a hopper, constructed, arranged, and operating substantially as described in another application referred to above, the vibratory motion being imparted to the hopper by the forked stand q, secured to the operating-bar G, and acting upon a pin, r, projecting from the side of the hopper. N is an inclined chute, leading from the hopper to the horizontal channel s, in which the plunger O is arranged, and reciprocates to feed the lower rivet descending the chute into the receiver E. The plunger O is moved in one direction by the pivoted wedge P, and in the opposite direction by the spring t; the construction, arrangement, and operation of the chute N, channel s, plunger O, wedge-cam P, and receiver E being essentially the same as described in my prior application referred to. The riveting-hammer I is mounted in bearings u and v, and is moved downward against the tension of the spring w by the lever Q, pivoted at w' to the under side of the table A, and arranged to be operated by the bar G through the medium of the pin s^1 working in the slot s^2. The front end of the lever Q is provided with a steel pin, t^1, fitted to a socket in said lever, with the spring t^2 behind it, tending to force it outward, which tendency is checked at the proper point by the pin w^1 striking against the end of the slot w^2. The pin t^1 strikes upon the upper surface of the collar o^2 as the movable end of the lever Q descends, and moves downward the riveting-hammer I, compressing the spring w until the pin t^1 is drawn off from said collar by the action of the wedge w' upon the pin w^1, when the hammer I will be thrown upward with great force by the reaction of the spring w, and head up the rivet upon the burr. The lower side of the collar o^2 is made conical, so that when the lever Q is moved upward, the pin t^1 will be forced into its socket in the end of the lever Q, compressing the spring t^2 until it has passed the collar o^1, when the spring t^2 will force the pin t^1 outward again into a position to engage with the collar o^2 again in its next descent. The bearing u is adjustable in the stand R, for the purpose of regulating the tension of the spring w. The bearing v is mounted upon the spring v', and supports the forward portion of the carrier-bar g, in such a manner that the bar g, with the material resting thereon, may yield when the pressure thereon is increased beyond a given point by a slight increase in the thickness of the goods, as will often happen, especially in riveting leather goods—such as shoes, for instance.

The operation of my improved machine is as follows: The hopper M being supplied with rivets, the machine is operated till a line of rivets descend the chute N, and the first rivet is fed by the plunger O into the receiver E, when the tube H is filled with the burrs or washers, the lower one in the column falling into the recess h in the bar g. The material to be riveted is now placed in position on the table between the receiver E and the bar g, when the operator places his foot upon the treadle, (not shown,) and moves the bar G downward, the first result of which is to move the bars g and K toward the front of the machine until the punch j is in line with the axis of the setting-tools, when the inclined lug k upon the inner side of the bar G, coming in contact with the truck J′ on the rear end of the punch-lever J, causes the punch j to descend and perforate the material, the spring p causing the punch j to be withdrawn from the material as soon as the lug k has passed the truck J′, and the spring o causing the bar K, carrying with it the lever J and punch j, to be retracted as soon as the rib n has passed below the pin l, so as to remove the punch j from the path of the setting-tools.

The forward motion of the bar g continues until the center of the burr contained in the recess h is exactly in line with the axis of the setting-plunger D, riveting-hammer I, and the hole just formed in the material. A further descent of the bar G causes the toggle-links a a^1 to be straightened, which causes the plunger D to descend, carrying with it the receiver E, and the rivet contained therein, till the lower end of the receiver rests upon the material, when the receiver remains stationary, while the plunger D continues to move downward, forcing the rivet out of the retaining-jaws, and through the material and the burr in the recess h in the bar g till the head of the rivet is pressed hard against the upper surface of the material. In the meantime the lever Q has been moved downward by the descent of the bar G, carrying with it the hammer I, and just at the right time the hammer is released, and is forced upward by its spring w, causing it to strike a smart blow upon the end of the rivet, and heading it over onto the burr, thus securing the material together. The upward movement of the bar G brings the toggle-links into the position shown in the drawings, raises the plunger D, and the receiver E retracts, the carrier-bar g raises the lever Q above the collar o^1, and the pivoted wedge P, coming in contact with the end of the plunger O, moves it toward the receiver, and transfers another rivet from the chute into the receiver, in readiness to be set by the next downward motion of the plunger D. The pivoted wedge P, in passing the end of the plunger O as the bar G descends, vibrates about its pivot against the tension of the spring P′, and is again thrown out into the position shown in the drawings by said

spring as soon as it has passed the plunger O. The bar G may be driven by power by means of a crank and connecting-rod, and in cheap machines the hopper-chute and plunger O may be dispensed with, the rivet being placed in the receiver by hand through an opening in the front.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a riveting-machine, the combination of the plunger D, receiver E, hammer I, and tubular receptacle H, into which a column of burrs or washers may be placed, and from the lower end of which the bottom burr or washer may be separated and fed into a position in line with the setting-tools, substantially as described.

2. In a riveting-machine, the combination of a pivoted hopper provided with a slot, as shown, into which the rivets are placed in bulk, and from which they emerge in regular order, with their heads all in one direction; an inclined chute, down which the rivets move from the hopper to the setting-tools; a tubular receptacle, in which is placed a column of burrs or washers, one above another, and a reciprocating carrier-bar, all arranged as set forth, to separate a single rivet and a single burr, and feed them into position, so that the descent of the setting-plunger will pass the rivet through the material to be riveted, and through the burr, all substantially as and for the purpose described.

3. The operating-bar G, provided with the cam-slot *e*, in combination with the carrier-bar *g*, provided with the recess *h*, arranged to feed the lower burr in the column of burrs in the tube H to the setting-tools, substantially as described.

4. The operating-bar G, provided with the inclined lug *k* and cam-groove *m*, having the pivoted side *n*, in combination with the reciprocating bar K, pivoted lever J, carrying the punch *j*, and the springs *o* and *p*, all arranged to operate substantially as described, for the purposes specified.

5. The combination, in a machine for setting rivets, of a punch adapted to be moved into position to punch the material to be riveted directly in line with the setting-tools, and then to recede from its position; a mechanism for separating a single rivet from a number, and feeding it to a position in line with the setting-tools upon one side of the material; a mechanism for separating a single burr from a column of burrs, and feeding it into a position in line with the setting-tools upon the other side of the material; a mechanism for forcing the rivet through the hole punched in the material, and through the hole in the burr, and a hammer arranged to rivet the whole together by a single blow, the consecutive actions being accomplished without moving the goods on the table, substantially as described.

6. The vibrating lever Q, provided with the yielding pin t^1, in combination with the hammer-rod I, provided with the collar o^2 and spring *w*, all arranged to operate substantially as described.

Executed at Boston, Massachusetts, this 5th day of February, 1875.

MELLEN BRAY.

Witnesses:
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E. A. HEMMENWAY.