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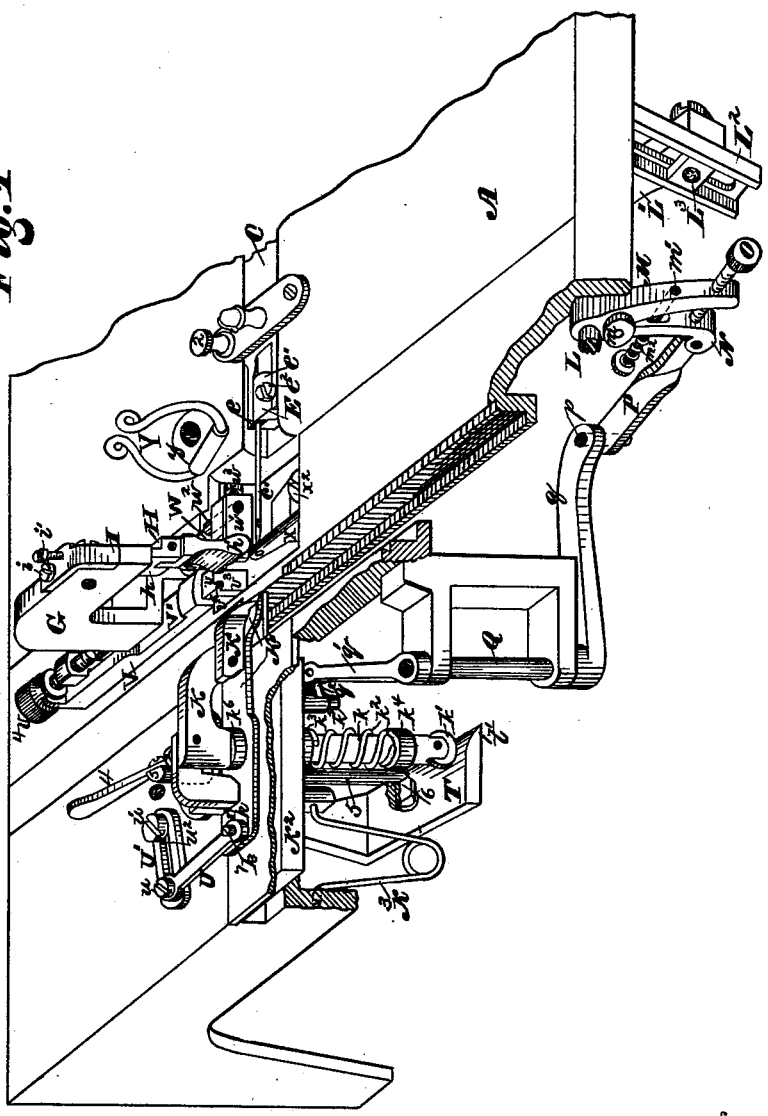
S. C. BROWN.

STRAW-BRAID SEWING-MACHINE.

No. 191,647. Patented June 5, 1877

Fig. 1



Witnesses

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Fig. 2

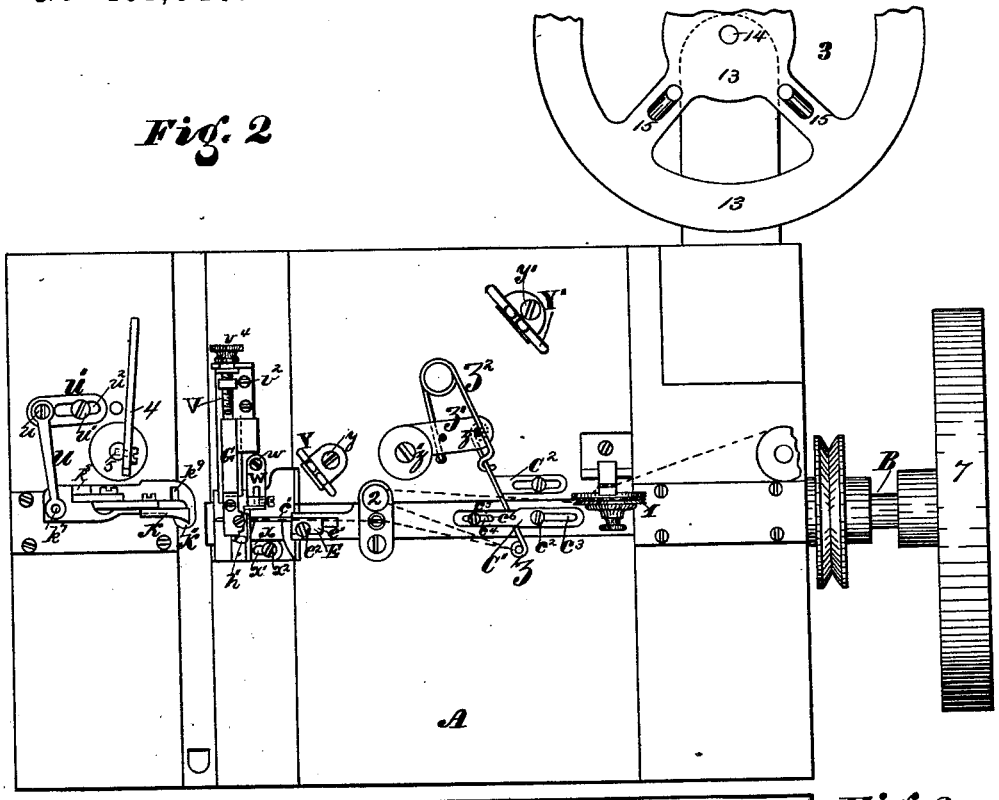
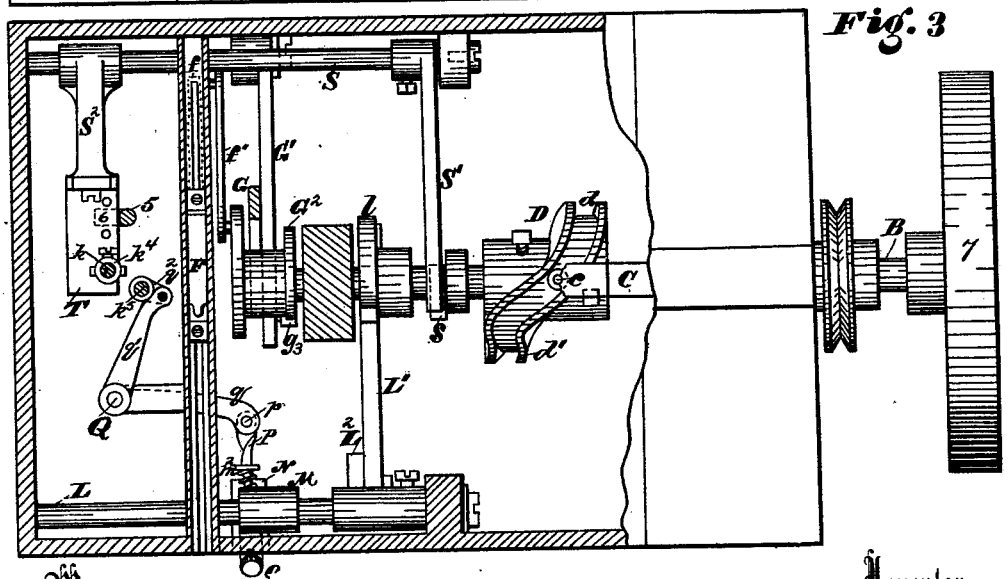


Fig. 3



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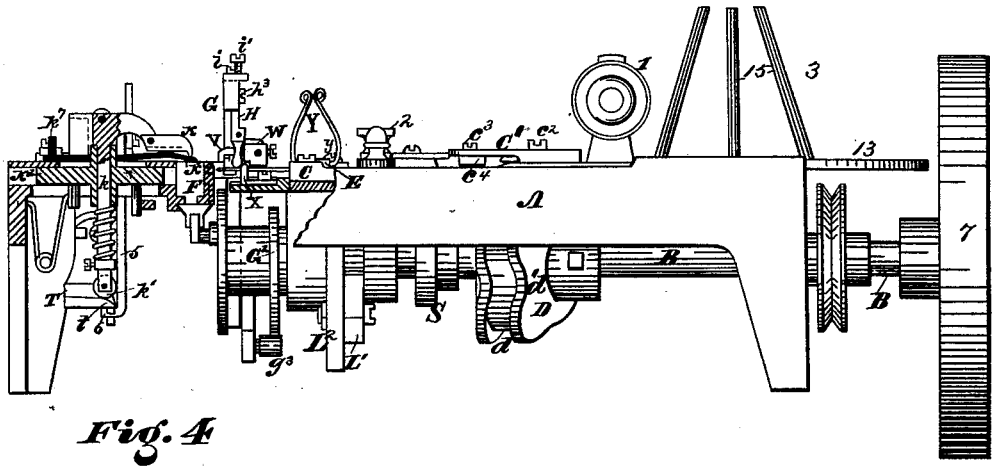

Fig. 4

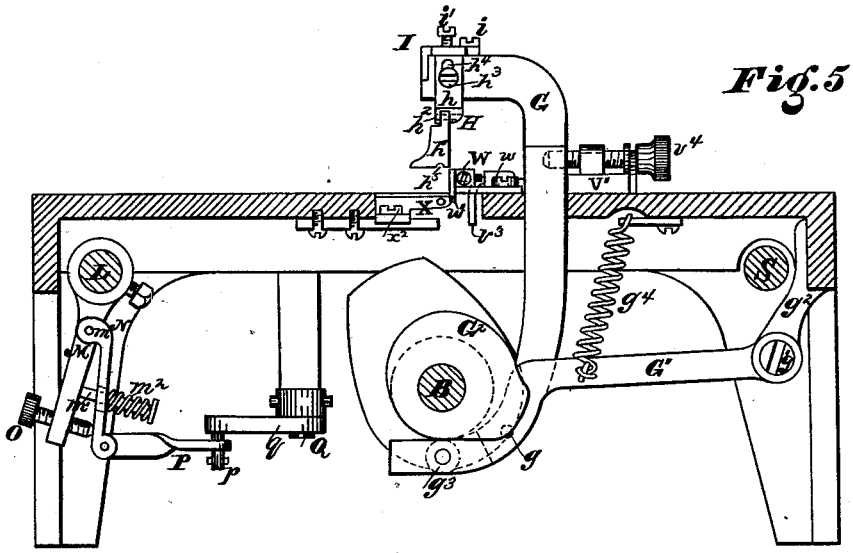

Fig. 5

Witnesses

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STRAW-BRAID SEWING-MACHINE.

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Fig. 6

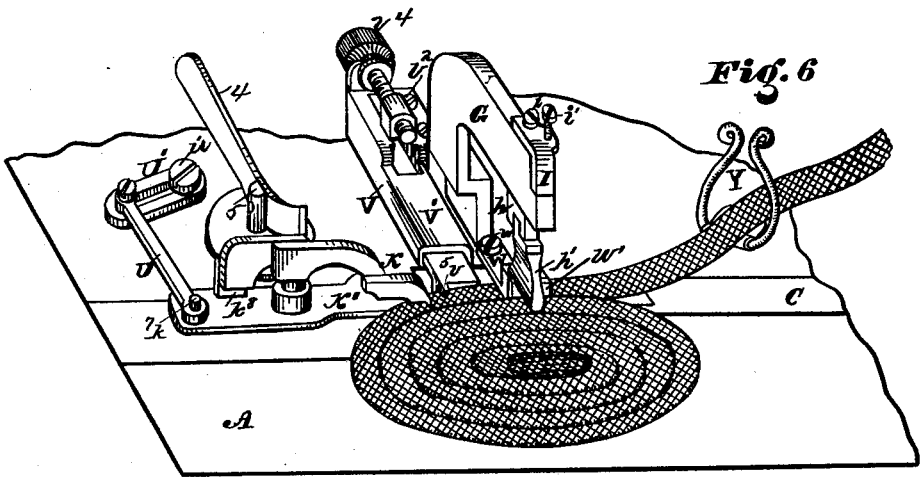

Fig. 7

Fig. 8

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UNITED STATES PATENT OFFICE.

SEYMOUR C. BROWN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO JOHN D. SCHEETZ, OF SAME PLACE.

IMPROVEMENT IN STRAW-BRAID-SEWING MACHINES.

Specification forming part of Letters Patent No. **191,647**, dated June 5, 1877; application filed February 3, 1877.

To all whom it may concern:

Be it known that I, SEYMOUR C. BROWN, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Straw-Braid-Sewing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a broken perspective; Fig. 2, plan; Fig. 3, plan with part of the top of the bed-plate removed; Fig. 4, broken side elevation, partly in section; Fig. 5, vertical transverse section; and Fig. 6 is a perspective of my invention, showing the position of the braid on the bed-plate; Figs. 7 and 8, longitudinal sections of braid, showing the construction of my improved stitch.

My invention has relation to machines for sewing straw braid; and consists in the novel construction, combination, and arrangement of devices, as hereinafter described, and specifically set forth in the claims.

Referring to the accompanying drawing, A designates the bed-plate of the machine, and B a shaft mounted therein, the various motions required for the needle, feed, shuttle-carrier, and other moving parts being derived from said shaft.

C represents the needle-arm, having a stud, *c*, on its under side, on which is mounted a friction-roller, which enters a peripheral groove, *d*, in a cam, D, on the shaft B. The needle (shown at c^1) is fastened in the arm C by entering a groove in the end thereof, where it is held by a block, E, the side of said block adjacent to the needle being beveled, as shown at *e*. Said block is formed on its under side with a rounded shoulder, e^1, and is secured in position by means of a screw, e^2, which enters the needle-arm C.

F is the shuttle-carrier, moving in a race transverse of the bed-plate A. Said carrier is formed with a downwardly-projecting arm, *f*, which has a pivotal connection with the crank-arm *f'* on the end of the shaft B, by means of which the necessary reciprocating motion is obtained.

G is a plunger, the province of which is to form a bend or loop in the straw braid just before the needle passes through the latter. Said plunger consists of a bar, which passes through a vertical opening in the bed-plate, being pivotally connected at *g* to an arm, G^1, which is pivoted at g^1 to a bracket, g^2, made fast on the under side of said plate.

Said arm G^1 is furnished with an anti-friction roller, g^3, which moves against the edge of a cam, G^2, on the shaft B, being held thereto by means of a spring, g^4. By the aid of these devices the plunger is moved up and down, and caused to dwell while the needle is passing through the straw.

H is the plunger-foot, formed in two sections, *h* and h^1, the latter being pivoted to the former at h^2, so as to permit it to be swung a little to either side. The upper section fits in a groove in the end of the plunger, being held by a screw, h^3, which passes through an elongated slot, h^4. I is an L-shaped plate, secured on the end of the plunger by means of a screw, *i*, and furnished with another screw, *i'*, whereby the plunger-foot H is vertically adjusted, the screw h^3 being first loosened whenever an adjustment is required. h^5 is a groove on the under side of the foot, through which the needle passes when forming the stitch. The feed consists of two jaws, K and K^1, into which the braid passes, and by which it is clamped and drawn away from the needle after the formation of each stitch.

k represents a vertical arm or rod, which is an extension of the jaw K, and passes downwardly through the jaw or plate K^1, and through the feed-carrier K^2, which is a block that moves longitudinally to and fro through a groove in the bed-plate A. The arm *k* terminates in an anti-friction roller, k^1, and is surrounded by a spiral spring, k^2, whose ends rest, respectively, against a boss, k^3, on the under side of the carrier K^2, and an adjustable collar, k^4.

The required to-and-fro motion of the shuttle-carrier is obtained as follows: L is a shaft parallel with the shaft B, and located under the bed-plate A in suitable bearings. Said shaft L is rocked from the shaft B by means of the arms L^1 L^2, the former terminating in a collar, *l*, which encircles an ec-

centric on the shaft B, and the latter being firmly fastened to the shaft L, said arms having a pivotal connection in the adjustable nut or box L^3.

M represents an arm, fast on the shaft L, to which is pivoted, at *m*, a lever, N. m^1 is a rod, fast in the arm M, and passing through a slot in the lever N, a spring, m^2, surrounding said rod, and pressing the lever N toward the arm M. O is an adjusting-screw in the end of the arm M, its end resting upon the lever N. By means of this screw the length of the feed is regulated. P is a twisted plate, pivoted on the lever N, and having a pivotal connection at *p* with the horizontal crank-arm *q* of the vertical shaft Q, which is sustained in a hanger underneath the bed-plate A. q^1 is a crank-arm on the upper end of said shaft, pivoted to a short plate, q^2, through which passes a pivotal stud, k^5, which projects downwardly from the feed-carrier K^2.

The proper reciprocating motion is imparted to the feed-carrier from the shaft L by means of the intermediate connections M N P Q, &c. The play of the feed mechanism is regulated by the screw O, which passes through the arm M and impinges upon the arm N. When this screw is turned the arm N is caused to move, and the leverage or play of the connections P *q* q^1, &c., lengthened or shortened, and the feed thereby adjusted.

To cause the jaw K to rise and fall for the purpose of clamping and releasing the braid as the carrier K^2 moves to and fro, I provide the following arrangement of devices: S is a shaft parallel with the shaft L, but on the opposite side of the machine. It is rocked from the shaft B by means of the arm S^1, which is fast upon it, the outer extremity of said arm resting upon a cam, *s*, on the shaft B.

S^2 is another arm, fast on said shaft S, and sustaining at its outer extremity an L-shaped bracket, T. The horizontal part *t* of this bracket, on which the roller k^1 rests and moves, is beveled or inclined, as shown at *t'*. When the shaft S is rocked the bracket T first rises, pushing up the rod *k* and elevating the jaw K. The carrier K^2 is now moved toward the plunger by the spring K^3, carrying with it both the jaws K and K^1. When the carrier K^2 has reached the limit of its motion in the described direction the shaft S rocks in such manner as to depress the bracket T. The rod *k*, under the influence of the spring k^2, follows the bracket, thus bringing down the jaw K on the braid, which is thus clamped. The carrier K^2 now makes its return motion, bringing back the jaws K and K^1, and drawing or feeding the straw the required length.

The feed may be adjusted in length by the screw O, as already described. It may also be adjusted laterally, so as to draw the braid obliquely to the needle, which is desirable in sewing in circles or volutes.

This is accomplished as follows: The jaw K^1, which is a plate of steel, has an opening near its center, through which the boss k^6 of the carrier K^2 passes, said jaw thus swiveling on said boss. k^7 is a stud projecting upwardly from the jaw K^1 near its rear end. Said stud forms a pivot for the connection of an arm, U, which is jointed at *u* to a plate, U', said plate being fastened to the bed-plate A by a screw, u^1, passing through the elongated slot u^2. By turning the plate U' around on the screw u^1 as a center to the required position, or by moving said plate U' backward or forward, (the screw u^1 moving along through the slot u^2,) the jaw K^1 will be swung into such position as to cause the braid to be fed at any desired angle. The jaw K will be correspondingly adjusted at the same time, the studs k^8 k^9 causing it to be moved in line with the jaw K^1.

To regulate the extent of the lap of the braids, I employ two gages, V and W, one on either side of the plunger. The former consists of the bar *v*, fitted in a bracket, v^1, which is made fast to the bed-plate A by a screw, v^2. The bar *v* has a turned-down end, v^3, and is adjustable longitudinally in its bracket by means of a set-screw, v^4. v^5 is a projecting stud on the gage V, to prevent the braid from rising. The gage W consists of an L-shaped bar, pivoted on the bed-plate A by a screw, *w*, to permit it to be swung around to one side. w^1 is a face-plate on this gage, having a projection, w^2, which passes through an opening in the vertical part of the bracket, and w^3 is a screw, by which the adjustment of said face-plate is regulated. These gages also serve to regulate the distance of the stitch from the lapped edges of the braid.

The straw braid passes under the gage W, the face-plate of which meets the edge of the braid last sewed on, the edge of the braid being sewed meeting the downwardly-turned part of the bar *v*. X represents the bridge, consisting of a vertical bar having an opening for the passage of the needle, and a horizontal foot, *x*, with slot x^1 and set-screw x^2, by means of which said bridge may be adjusted so as to leave a greater or less distance between it and the plunger G. Y and Y' represent braid-guides, located on the bed-plate A, as shown, said guides each consisting of a piece of wire bent to form a loop, and passed through a holding-plate, *y*, pivoted at *y'* to the bed-plate A. By turning these guides at different angles, so as to cause the braid to bind against opposite sides of each of the said guides, respectively, a tension will be produced on it.

Z represents the take-up, consisting of a rod pivoted at *z* to a plate, Z^1, secured to the bed-plate A by a screw, *z'*, on which it swivels. Z^2 is a spring, which presses against the take-up, and gives it its required return motion. Said take-up passes beneath a plate, C^1, fastened by a screw, c^2, to the needle-arm C, said screw passing through an elongated slot, c^3, in said plate C^1, whereby the latter is rendered longitudinally adjustable. Said plate C^1 is cut away on its under side to form a

passage for the take-up, said passage being wide enough to permit the take-up to move or swing laterally therein.

The width of said passage, and the consequent extent of movement of the take-up, is regulated by adjusting the plate C^1; another plate, C^2, which is fastened to the bed-plate A, and has an adjustment similar to that of the plate C^1, being also moved in like manner and for the same purpose. The width of said passage may be further adjusted by moving a block, c^4, which forms one of its sides, and is secured on the under side of the plate C^1 by means of a screw, c^5, which moves through an elongated slot, c^6.

The operation of the machine is substantially as follows:

The needle and shuttle being threaded in the usual manner, (the thread of the former passing around the tension 1, and through and around the tension 2,) the braid, which unwinds from a reel, 3, (which consists of a disk, 13, spindle 14, and inclined prongs 15,) located on the rear side of the bed-plate, is passed through the braid-guides Y and Y′, thence under the plunger G, resting upon the bridge X, and thence between the jaws K and K^1.

I would here remark that the upper jaw may be raised, for the purpose of entering the braid, by means of an eccentric lever, 4, secured to a vertically-sliding rod, 5, which rod has a turned-up end, 6, that passes beneath the bracket T. On depressing the free end of said lever the bracket T is raised, pushing up the extension k and elevating the jaw K.

On starting the machine (the shaft B and band-wheel 7 turning away from the operator) the plunger depresses the braids, which are lapped, as shown in Fig. 6, forming a U-curve therein, through which the needle passes. The shuttle now passes through the loop of the needle-thread. The needle is now partially withdrawn or moved backward, (such motion being produced by the return curve d' of the cam D,) so that its eye will follow the outer curve of the shuttle-point, thus keeping the needle-thread drawn taut when the shuttle makes its return motion. As the shuttle makes its return motion the needle again moves forward slightly, the eye of the latter following the curve of the former, as already described.

As soon as the shuttle has made its return motion the needle is withdrawn from the loop of the braid, the stitch shown in Figs. 7 and 8 being formed in the operation. The plunger now rises, and the braid is clamped by the jaws K K^1 and fed the required length. The feed being completed, the plunger again descends, as already described, and dwells with the braid until the stitch is formed therein.

The peculiarities of this stitch are as follows: It is barely perceptible on the outer side of the braid, the thread appearing only at points 8 8. On the other or inner side it shows as a straight line, 9, caught or looped at intervals 10. Between the loops of the braid, the needle-thread is carried past the loop 11 of the needle and shuttle threads, thence through the lower braid in a diagonal line to form the loop just mentioned, and forward, after forming such loop, to the next one.

What I claim as my invention is—

1. The bridge X, having a slotted base-plate, made adjustable in the direction of the needle-path, in combination with the bed-plate A, substantially as described.

2. The plunger-foot H, formed in two sections, h h^1, the latter being hinged upon the former, substantially as shown and described.

3. The jaw K, having the extension k passing through the base-plate A, and provided with an anti-friction roller, k^1, and spring k^2, in combination with the plate T, substantially as shown and described.

4. The feed-carrier K^2, in combination with the jaws K and K^1, the boss k^6 of the said carrier passing through the jaw K^1, and the extension k of said jaw K passing through said boss k^6, substantially as shown and described.

5. In combination with the bed-plate A and jaw K^1, the lever U and slotted bar or plate U′, for adjusting said jaw, substantially as shown and described.

6. In combination with the jaws K K^1, the studs k^8 and k^9 thereon, for causing the simultaneous movement of the jaw K, when the feed is adjusted laterally, substantially as shown and described.

7. In combination with the feed-carrier K^2 and rock-shaft L, the intermediate parts M, N, P, q, Q, q^1, and q^2, for conveying a reciprocating motion to said carrier from said shaft, substantially as shown and described.

8. In combination with the jaw K, having the downward extension k and rock-shaft S, the bracket T, secured to the arm S^2 of said shaft S, and the connecting mechanism, substantially as described, to raise and lower said jaw K, substantially as shown and described.

9. The combination, with the feed devices, of the rock-shaft L, the arm M, the pivoted lever N, the spring m^2, and screw O, whereby the feed is adjusted as to length of stroke, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 16th day of January, 1877.

SEYMOUR C. BROWN.

Witnesses:

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CHAS. F. VAN HORN.