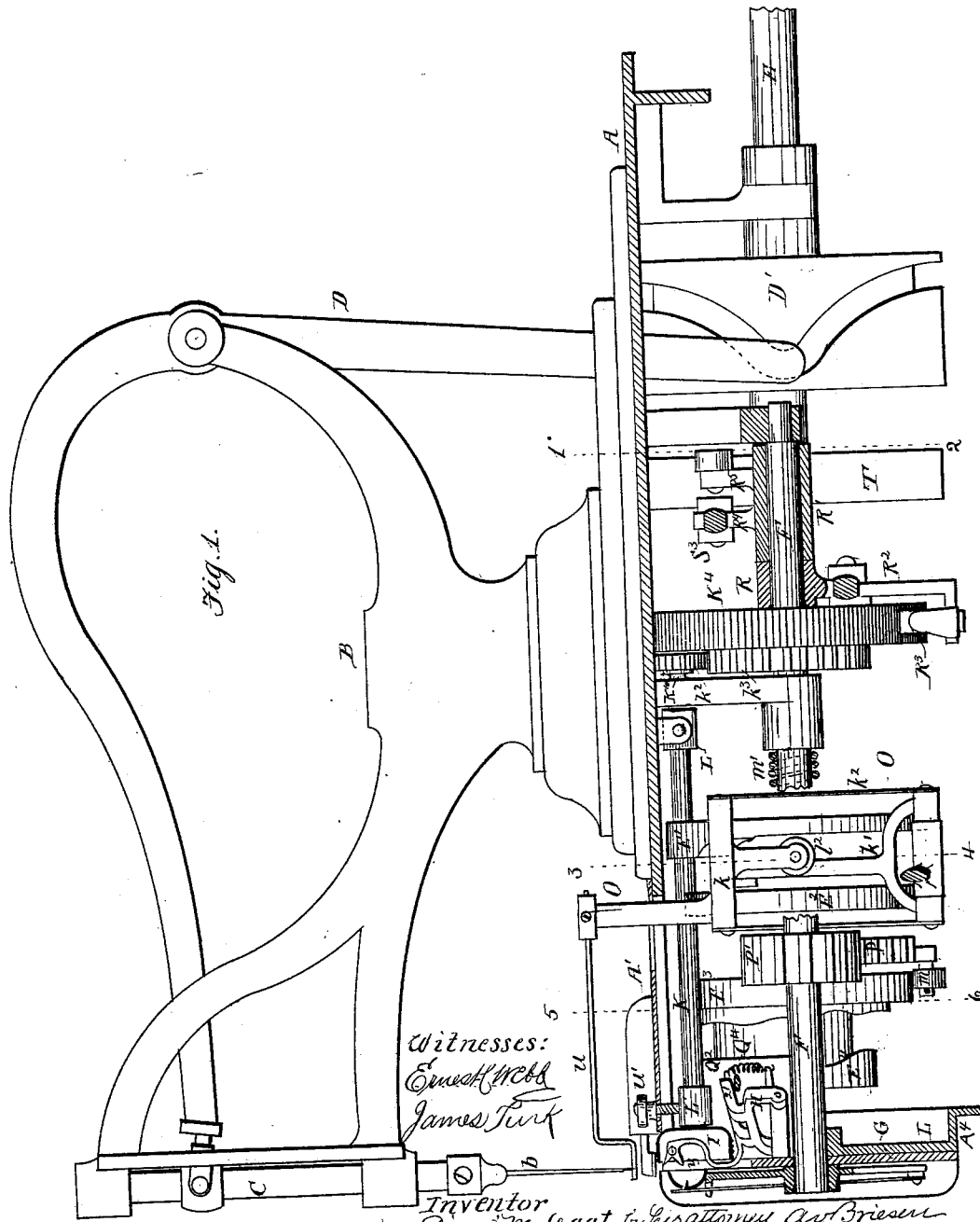


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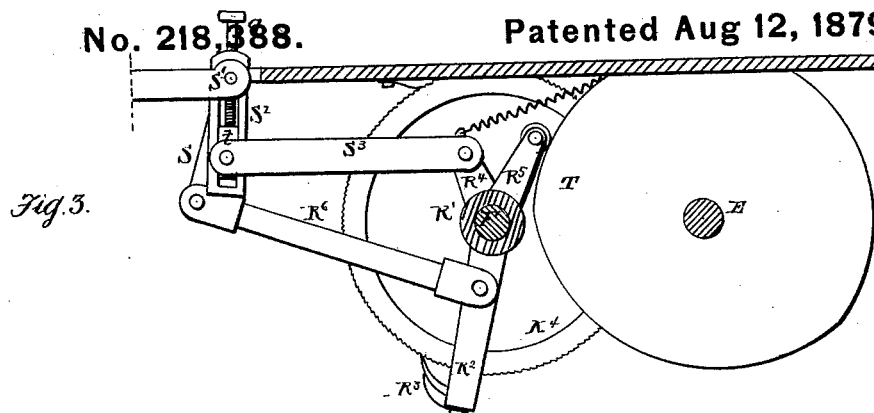


Fig. 3.

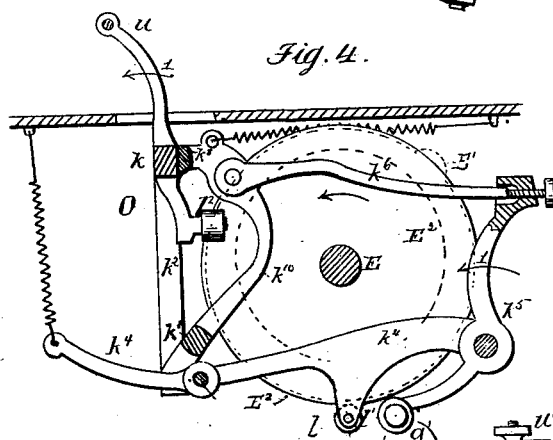


Fig. 4.

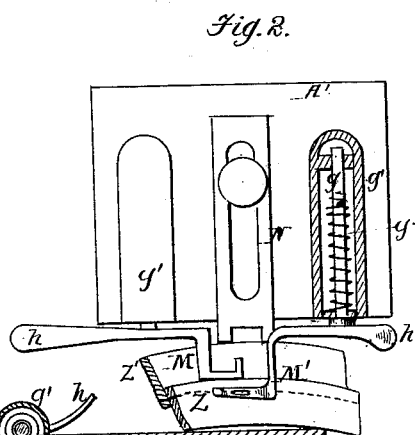


Fig. 2.

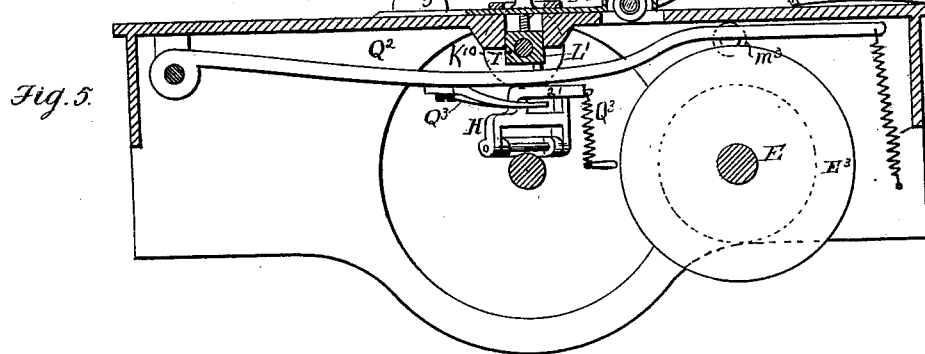


Fig. 5.

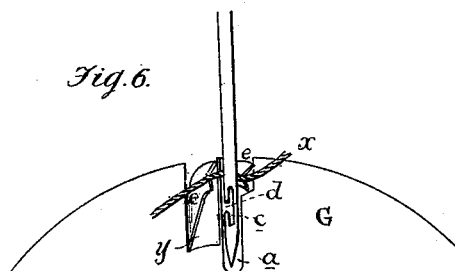


Fig. 6.

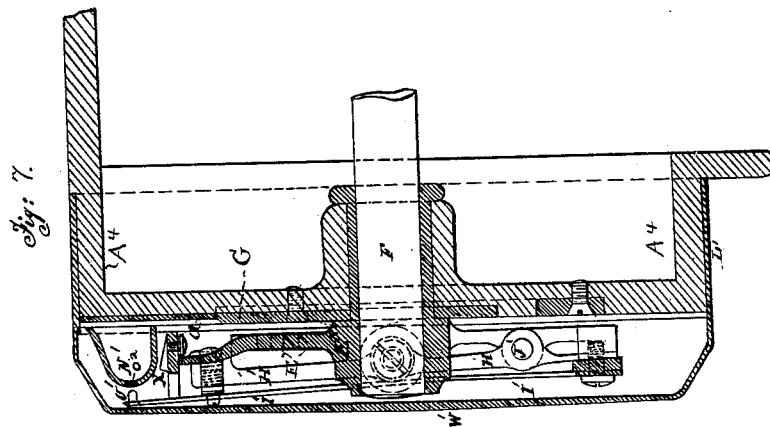
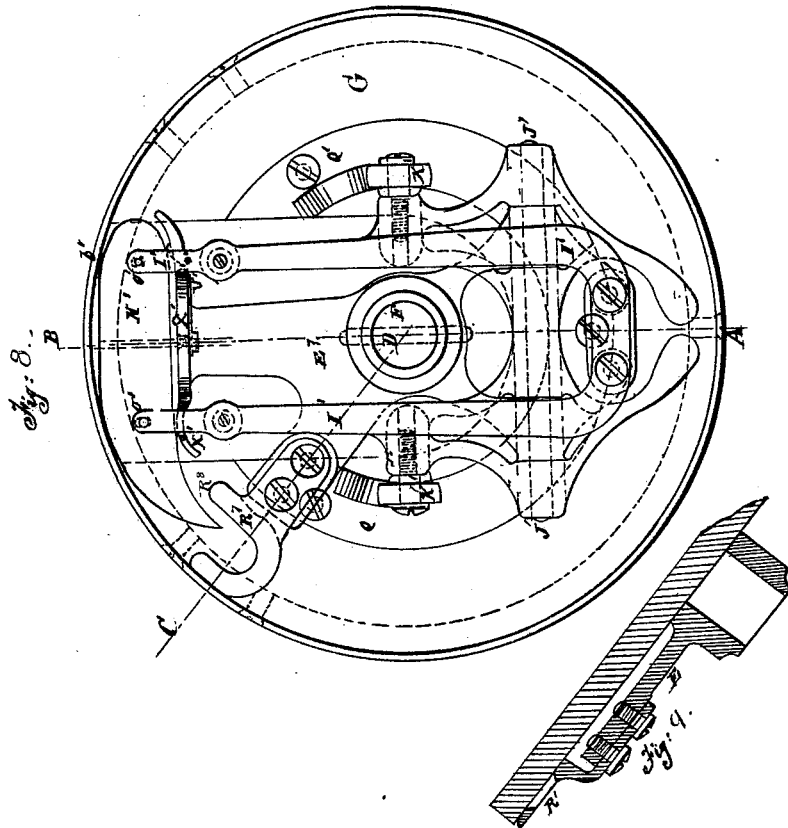
Witnesses:
Ernest Webb
James Turk

Inventor:
Desiré M. Legat
By his attorney
A. T. Briesen

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UNITED STATES PATENT OFFICE.

DÉSIRÉ MATHURIN LEGAT, OF PARIS, FRANCE.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **218,388**, dated August 12, 1879; application filed April 25, 1876; patented in France, January 20, 1875; patented in England, February 6, 1875.

To all whom it may concern:

Be it known that I, DÉsirÉ MATHURIN LEGAT, of Paris, France, have invented Improved Sewing Machinery Applicable for the Manufacture of Straw Hats and Bonnets and for other Purposes; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed sheets of drawings, making a part of the same.

My invention is a sewing-machine in which a shuttle oscillating in a vertical plane, a vertical reciprocating needle having an elongated eye open at one side, and certain feeding, thread-operating, and regulating devices operate together, as fully described hereinafter, for the special purpose of sewing straw braids, &c.

In the drawings forming part of this specification, Figure 1 is a longitudinal elevation, in part section, of my improved sewing-machine. Fig. 2 is a plan view of part of the machine, showing the gage, presser-feet, and attachments; Figs. 3, 4, 5, transverse sections on the lines 1 2, 3 4, 5 6 of Fig. 1, respectively; Fig. 6, a detached view, enlarged, showing the needle, shuttle-plate, and fingers for acting on the thread; Fig. 7, an enlarged section of the shuttle-operating appliances; Fig. 8, a face view of the shuttle-operating devices with the cap removed; Fig. 9, a section on the line C D, Fig. 8, and Fig. 10 an inverted plan.

A is the base-plate of the machine, supporting the overhanging arm B, in which slides the needle-bar C, operated by the lever D. In bearings below the base-plate turn the driving-shaft E and a rock-shaft, F, the latter driving the shuttle, as described hereinafter.

The shuttle-plate G forms the face of a circular case, L, at the front of the base. The plate G has a groove, *a*, to receive the needle *b*, in the lower end of which is an elongated eye, *c*, with a central throat, *d*, at one side, as shown in Fig. 6.

The shuttle-carrier consists of an arm, E', secured to the end of the shaft, and provided at the upper end with a shoe, X', upon which the shuttle N' rests. To the lower end of the arm E' are connected the ends of spring-arms I I', having at their upper inner ends lugs *o*, adapted to openings *o*² in the shuttle-case. Each arm I' is provided with a trunnion carrying a fric-

tion-wheel, K¹, and on the face-plate G are lugs Q Q¹, over which said wheels pass, so that the arms are successively lifted as the carrier vibrates, permitting the loop to pass over the shuttle without both arms at any time being simultaneously out of contact therewith. Upon an arm extending from the carrier E' is a guard, R¹, which facilitates the formation of the loop and covers, with its heel R², the point of the needle when the shank is uncovered and the point of the shuttle is passing over the same.

In order to insure the introduction of the thread *x* into the eye of the needle, one or more notched fingers are arranged to extend through a slot, *y*, in the plate G, and operated, as described, thereafter to carry the thread *x*, (which extends across the slot *y* from the shuttle to the work,) as the needle descends, into the eye thereof, the fingers being withdrawn back of the plate prior to the return movement of the shuttle.

To prevent the thread from escaping from the needle, as well as to regulate the movements and tension of the thread above the fabric or other article sewed, I employ an arm, *u*, capable of being operated by the devices hereinafter described in the desired direction.

The material is fed by means of an intermittently-rotated wheel, I, projecting upward through the plate A⁴, the said wheel being recessed to receive the fingers *e*, which extend from a rocking frame, H, pivoted at the rear of the plate G, and retracted by a spring, Q³.

The wheel I is carried by a shaft, K, turning in a pivoted bearing, L, and in a sliding bearing, L', adjustable vertically by means of a set-screw, *u*', bearing on the plate A¹, through which extends a threaded pin from the bearing.

To effect the requisite pressure upon the different braids of straw or other material, two presser-feet, M M', bearing at different points upon the feed-plate, are used. Each presser-foot is maintained against the work by means of a spring, *g*², coiled round the shaft, and the presser-foot M' serves also as a guide for the needle and of the thread by means of the needle-hole in it. The presser-foot M is auxiliary to the presser-foot M', may serve as a guide for the upper braid, Z, Fig. 2, and an adjust-

able gage, N, regulates the position of the edge of the under braid, Z'.

Motion is imparted to the lever D by the cam D' on the shaft E, which also carries the cam-wheels E¹ E² E³ E⁴.

The thread-controlling arm *u* is carried by a frame, O, Fig. 4, consisting of cross-bars K K¹ and spring-bars K², the upper cross-bar sliding on a cross-bar, K³, of an arm, K¹⁰, extending from the cross-bar K¹, the said frame being operated from the cams E¹ E² through the medium of rock-levers K⁴ K⁵ and arm K⁶, arranged as shown in Figs. 4 and 10, the levers and frames being provided with friction-rollers *l* *l*¹ *l*², as shown. Thus the cam E¹, bearing on the roller *l*¹, throws the lever K⁵, and K⁶, and frame O in the direction of the arrow 1, Fig. 4.

The side motion of the frame is imparted by the cams bearing on the roller *l*², (see Fig. 1,) the vertical motion by the cam bearing on the roller *l*, suitable springs maintaining the bearing parts in contact with the said cams.

The rocking motion of the shuttle-carrier E⁷ and its shaft is imparted by a segment, P, gearing into a pinion, P', upon the shaft F, and operated by the cam E³, bearing on a roller, *m*, a spring, *m*', turning the shaft in one direction when the segment ceases to act to turn it in the other.

A lever, Q², extends over the cam E⁴, is raised thereby and depressed by a spring, and an arm, Q³, from said lever extends below an arm, 21, of the frame H, which is thus moved in one direction by the lever, in the other by the spring Q⁴, so as to carry the fingers *e* in and out.

The feed-wheel shaft K¹⁰ runs through a case, K, and is operated by a toothed wheel, K³, gearing with a pinion, K², on the shaft K¹⁰, the wheel K³ turning with a serrated disk, K⁴, on the shaft F, on which also turn sleeves R R¹, the former carrying an arm, R², and spring-pawl R³, which engages with the edge of the disk K⁴, and the latter having two arms, R⁴ R⁵.

The arm R² is connected by a rod, R⁶, with an arm, S, on a rock-shaft, S¹, which is provided with a slotted arm, S², carrying a slide, *t*, which may be raised and lowered by a screw, *q*, and to which is connected one end of a rod, S³.

The arm R⁵ carries a roller, which bears on a cam, T, on the shaft E, which, as it rotates, rocks the shaft R¹, and from the latter the shaft S¹ and arm R², the spring-pawl engaging with the teeth of the disk K⁴ and driving the feed-wheel.

By adjusting the block *t* the extent of the vibration of the arm R² and amount of feed is regulated.

The action of the mechanism is as follows:

The straw braid, which I have taken by way of example, is preferably wound on a sort of reel, and led beneath the pressers in contact with the guides, the edge of one braid overlapping that of the other beneath the needle. The needle passes through the plait, receives the thread brought to it and carried into its eye by the fingers *e*, and, rising, carries the thread doubled above the work, the controller *u* pressing against the thread to keep it in the throat of the eye, so that it will not escape when the needle again descends.

The various cams and levers described and shown in connection with the frame carrying the controller *u* permit the latter to be raised, lowered, and moved to and from the needle, and are so adjusted that the controller shall be brought against the thread as or before the needle begins its downward movement, carrying it toward the side opposite the eye, hold the loop in the eye, keep it there as the needle descends, and prevent it from escaping by becoming slack, as described, releasing it as the needle enters the braid, then moving out of the way prior to the next stitch. As the needle descends it holds the thread looped in the upper portion of the eye, and while the loop is below the work-plate the shuttle passes through the same, the thread also escaping from the eye, into which a portion of thread extending directly from the shuttle is again introduced and carried upward, as before.

The feed takes place when the needle is elevated.

This machine permits the hat to be commenced at the crown, so that the work may be readily guided, as required, without limit as to the size or shape of the hat.

I claim—

1. The combination, with the reciprocating notched needle and oscillating shuttle, of the fingers *e*, arranged beneath the work-plate, and devices for operating said fingers to carry the thread into the eye of the needle when the latter is below the work, substantially as set forth.

2. The combination, with the reciprocating needle, of the tension-rod *u*, and frame O, and appliances for operating said frame laterally and vertically and back and forth, as described.

3. The combination of the reciprocating needle, oscillating shuttle, recessed feed-wheel I, extending through the work-plate, slotted shuttle-plate G, and notched fingers *e*, extending into said feed-wheel and vibrating through the slot in the shuttle-plate, as set forth.

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Witnesses:

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