No. 650,241. Patented May 22, 1900.

H. HARRISON & A. RITTER.

FEEDING MECHANISM FOR SEWING MACHINES.

(No Model.) (Application filed Nov. 27, 1899.) 3 Sheets—Sheet 1.

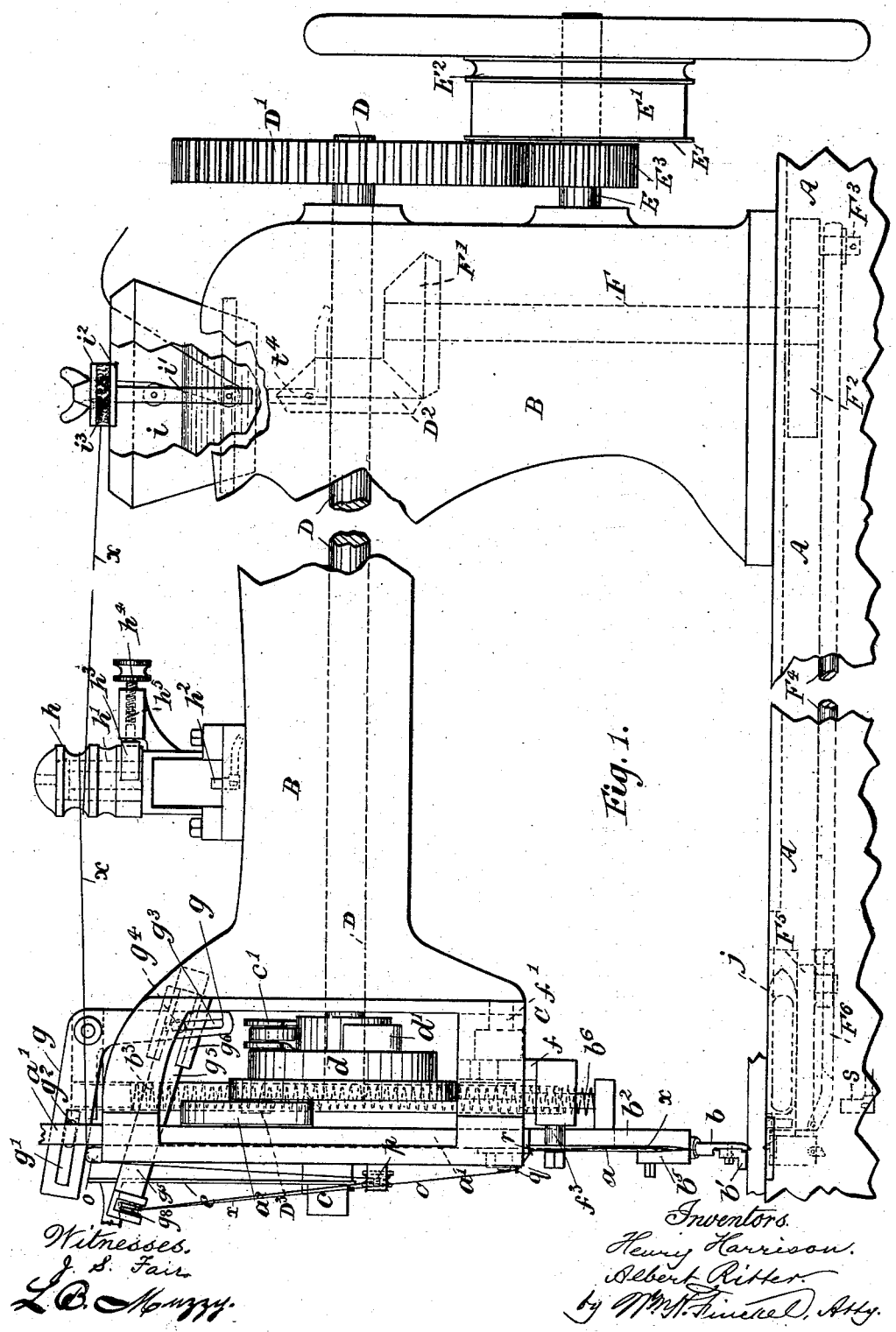

Fig. 1.

Witnesses.
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Fig. 2.

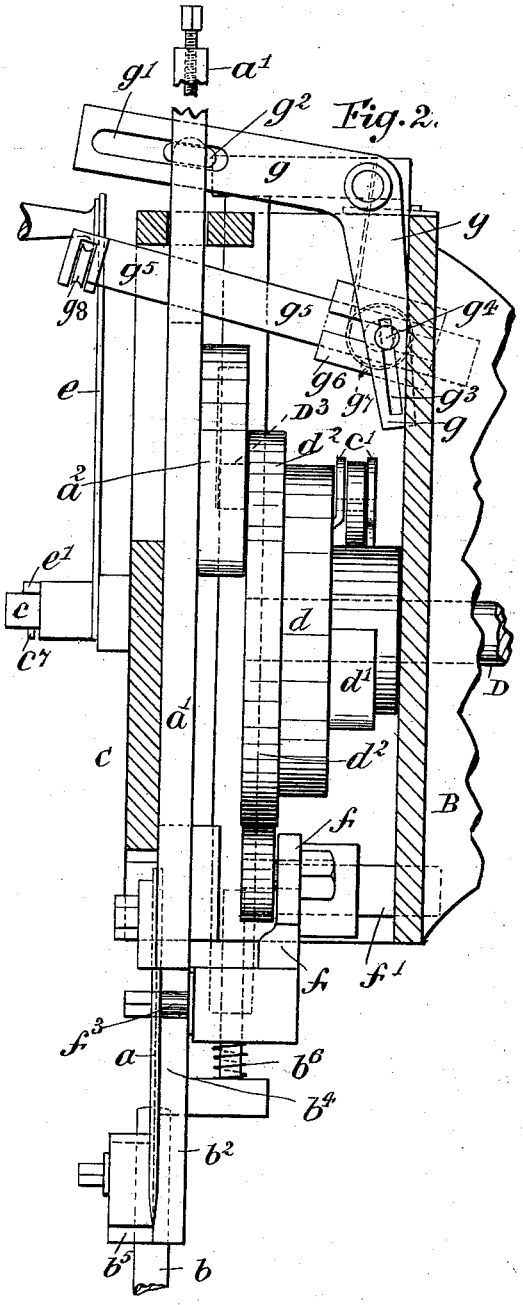

Fig. 3.

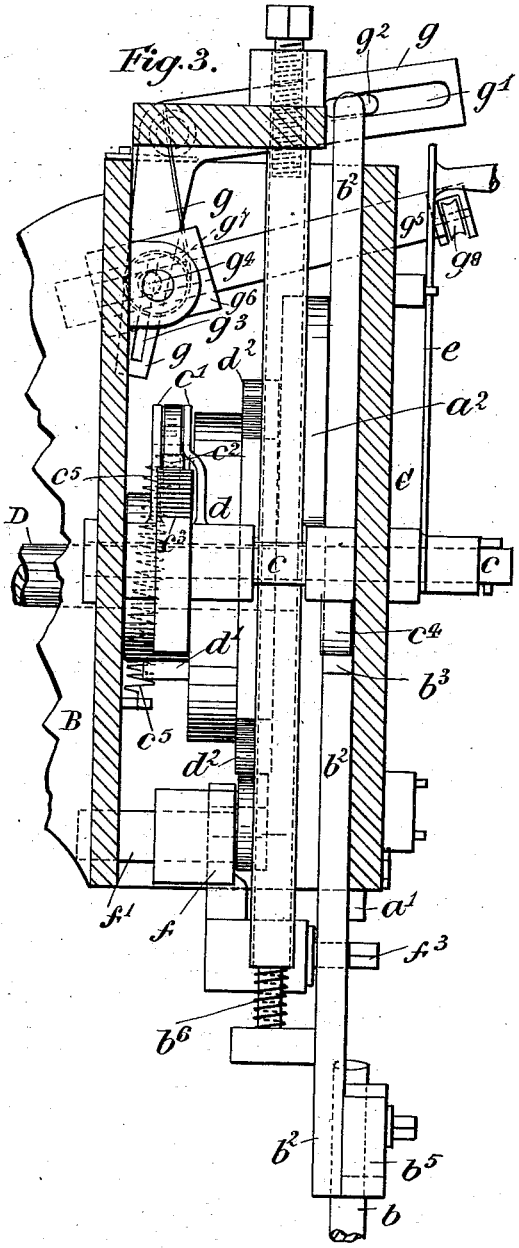

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Fig. 4.

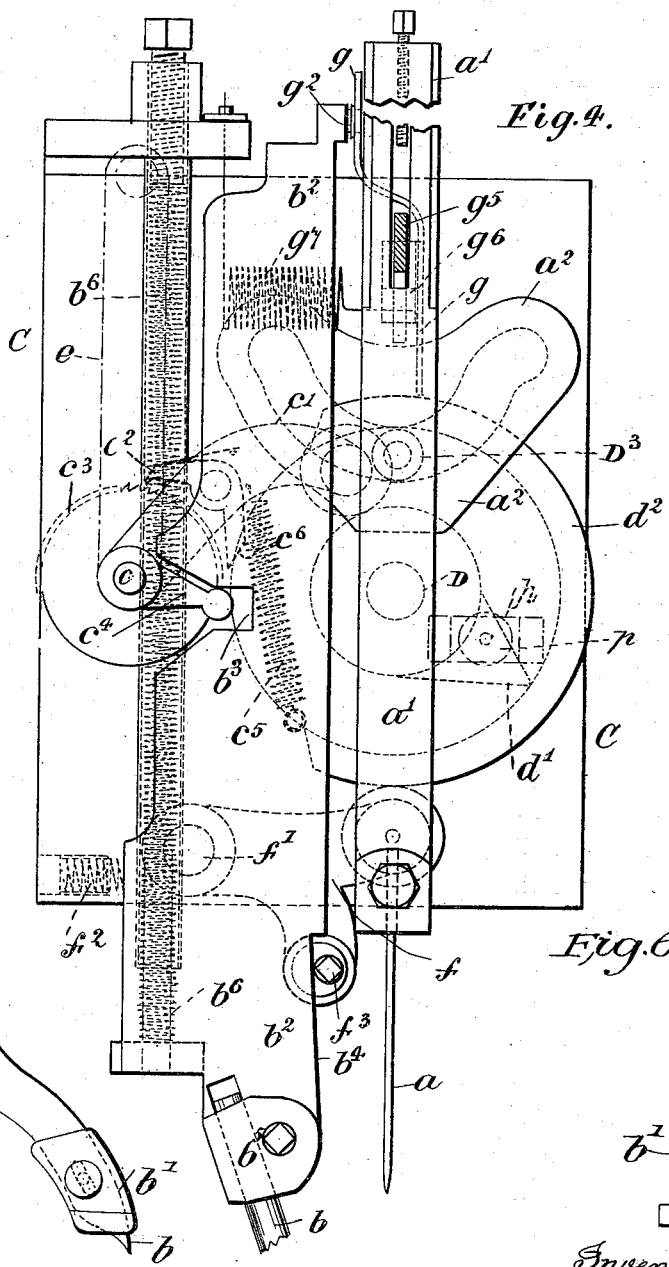


Fig. 5.

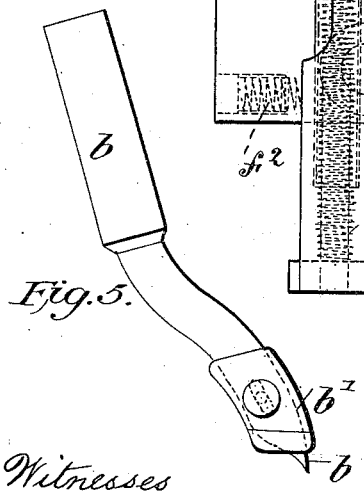
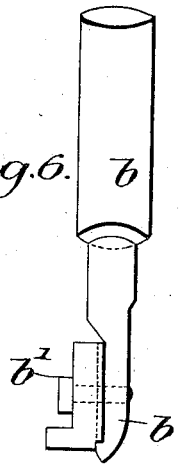


Fig. 6.



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UNITED STATES PATENT OFFICE.

HENRY HARRISON AND ALBERT RITTER, OF LONDON, ENGLAND.

FEEDING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 650,241, dated May 22, 1900.

Application filed November 27, 1899. Serial No. 738,441. (No model.)

To all whom it may concern:

Be it known that we, HENRY HARRISON, a subject of the Queen of Great Britain, and ALBERT RITTER, a citizen of the Swiss Republic, both residing at London, England, have invented certain new and useful Improvements in Wax-Thread or Dry-Thread Sewing-Machines, of which the following is a full, clear, and exact description, and for which we have made application for British patent, dated February 18, 1899.

We will describe our invention by the aid of the accompanying drawings, in which—

Figure 1 is a side view, with parts broken away, of a sewing-machine provided with our improvements. Figs. 2 and 3 are two opposite side views, partly in section; and Fig. 4 is a front view of the head of the machine, with the face-plate removed, drawn to a larger scale than Fig. 1. Figs. 5 and 6 are elevations, drawn at right angles to each other, of the presser and feeder.

A is the bed or base of the machine; B, the arm; C, the head; D, the main shaft; E' E^2, the driving-pulley, mounted on the stud E and which is driven by a strap or band from a suitable motive power.

E^3 is a toothed pinion fixed to the pulley E' and giving motion through the toothed pinion D' to the main shaft D. On the main shaft D is fixed a bevel-wheel D^2, which gives motion to a vertical shaft F by gearing into a bevel-wheel F', fixed to the upper end of said shaft. On the lower end of shaft F is fixed a disk F^2, having a crank-pin F^3, which by a connecting-rod F^4 gives motion to the shuttle-carrier F^5.

The machine has a straight needle *a* and needle-bar *a'*. A top feeder *b*, carrying an adjustable presser *b'*, is automatically regulated to any thickness of work for which the machine is adapted and is so arranged that it will automatically pass either from thick to thin or from thin to thick work. The needle-bar *a'* is operated as follows: It has fixed thereto a cam a^2, which is acted upon by a crank-pin D^3 on the compound cam *d*, fixed to the front end of shaft D. The part D of the compound cam acts upon a lever *c'*, mounted with capability of rocking on a shaft *c*, mounted in the head of the machine, and said rocking lever transmits the movements of the cam *d'* to the feeder-slide b^2 in the following manner: A pawl c^2, pivoted to the lever *c'*, engages with a ratchet-wheel c^3, fixed on the shaft *c*, and thus causes the said shaft to partially rotate. On said shaft C, in front of the ratchet-wheel c^3, is fixed a finger c^4, which engages in a slot b^3 in the feeder-slide b^2.

The thickness of the material to be sewed regulates the height of the feeder-slide b^2, which in turn acts on the finger c^4, and so causes the rocking shaft *c* to turn backward if thicker material is placed under the feeder or permits it to turn forward if thinner work is presented, thereby causing the spring-pawl c^2 to engage in different teeth of the ratchet-wheel c^3. The cam *d'* lifts the lever *c'* and a spring c^5 keeps said lever in contact with the cam. The spring-pawl c^2 engages the ratchet-wheel c^3 when the lever *c'* is lifted and disengages therefrom when the lever falls, thus permitting the feeder-slide b^2 to drop freely and so turn the rocking shaft *c* in its descent. This disengagement is effected by a stop c^6, acting on the tail of the pawl c^2. As the thickness of material to be sewed varies, so will a different tooth of the ratchet-wheel c^3 be presented to the pawl, and thus is obtained the same lift above the work for feeding purposes, either for thick or thin work or for any length of work of varying thicknesses.

For lifting the feeder-slide b^2 by hand a spring-handle *e* is provided on the front of the machine, mounted on the outer end of the rocking shaft *c*. On the boss of said spring-handle is a projection or tooth *e'*, and on the end of the rocking shaft *c* is fixed a pin c^7. When lifting the feeder-slide b^2, the tooth or projection *e'* engages with the pin c^7 and turns the rocking shaft *c*, which, by the finger c^4 lifts the feeder-slide b^2. A spring b^6 acts to press the feeder-slide b^2 downward.

For feeding the work to be sewed a lever *f* is mounted on a stud *f'* in the head of the machine. Said lever *f* is worked by the cam d^2 and moves the feeder-slide b^2 forward, a spring f^2 moving it in the contrary direction. The size of the stitch is regulated by an eccentric-pin f^3 on the end of an arm of the lever, said pin working against the front edge of the feeder-slide b^2. The front edge of the feeder-slide b^2, on which the eccentric-pin f^3

works, has an inclined face b^4, so that the same length of feed is obtained on thick or thin work with the same setting. By partially rotating the eccentric carrying the pin f^3 a longer or shorter feed, and consequently stitch, can be obtained.

The bottom end of feeder-slide has a boss b^5, having a round hole passing through the same at an angle to receive the stem of the presser and feeding foot $b\,b'$. The hole in the boss b^5 being at an angle allows the feeding and presser foot to be readily adjusted the required distance from the needle.

As the machine is designed to sew thick and thin work automatically, we provide an automatically-adjusted thread-supplier, which is worked from the feeder-slide b^2. A crank-lever g is pivoted in the head of the machine. One arm of said crank-lever has a slot g', within which works a stud g^2 at the top of the feeder-slide b^2, while the other arm of said crank-lever is provided with a slot g^3 to receive a stud g^4 on an outwardly-movable thread-handler g^5, mounted in a rocking boss g^6, carried by the head of the machine, said thread-handler being worked downward by the needle-slide a' and returned by a spring g^7, as usual. When the feeder-slide b^2 is raised, it lifts one arm of the crank-lever, which in turn, acting on the thread-handler g^5, causes the latter to project a greater or less distance from the front of the head of the machine, which gives more or less thread, according to the thickness of work placed under the feeder-slide.

For the top-thread tension we employ a circumferentially-grooved dome h, around which the thread travels after leaving the thread-waxing pot i. Said dome revolves on a fixed spindle h', through which a hole is drilled to admit the heat from a gas-jet h^2 to evenly warm the dome. The tension is regulated by a friction-piece h^3 acting on the side of the dome h, the pressure exerted by said friction-piece being regulated by a screw h^4, acting through the medium of a spring h^5 on the pin of the friction-piece. The thread x passes over the edge of the wax-pot i, and then around rollers in a plate i', from the upper one of which it passes between two clamping-plates i^2, having a mass of horsehair i^3 between them to secure an even amount of wax to the thread. The thread then passes to the friction-dome h, thence over the guide-rollers o, down around the roller p, up to the roller g^8 at the end of the thread-handler g^5, and thence down through the guide-eyes $q\,r$ to the eye of the needle a.

The shuttle j is moved to and fro by the shuttle-carrier F^5, which latter runs to and fro on the bar A' and is operated as hereinbefore described.

s is a gas-jet to warm the shuttle and shuttle-carrier, and t is a gas-jet to warm the wax-pox i.

Having fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a sewing-machine, the combination with a top feeder, of means for automatically adjusting the action thereof to suit different thicknesses of work, such means consisting of a cam on the main shaft, a rocking shaft and a pawl-lever mounted loosely thereon and operated by said cam, a spring-pawl on said lever, an opening in one side of the feeder-slide, an arm fixed on the rocking shaft and entering the opening in the feeder-slide, a segmental ratchet-wheel fixed on the rocking shaft, with which the pawl engages, and a spring to keep the operating-lever up to its cam, substantially as herein set forth.

2. In a sewing-machine, the combination with a top feeder, of means for automatically adjusting the action thereof and to secure uniformity of feed when working on different thicknesses of work, such means consisting of a cam on the main shaft, a pawl-lever mounted loosely on a rocking shaft, and operated by said cam, a spring-pawl on said lever, an opening in one side of the feeder-slide, an arm fixed on the rocking shaft and entering the said opening, a segmental ratchet-wheel fixed on the rocking shaft, with which the pawl engages, a spring to keep the operating-lever up to its cam, a feed-operating lever pivoted to the machine-head, a cam on the main shaft acting on said lever, an adjustable pin on an eccentric carried by said lever, an inclined portion on the edge of the feed-slide on which such pin acts, and a spring acting on the opposite edge of the feed-slide, substantially as herein set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

HENRY HARRISON.
ALBERT RITTER.

Witnesses:
CLAUDE K. MILLS,
WM. GIRLING.