3 Sheets—Sheet 1.

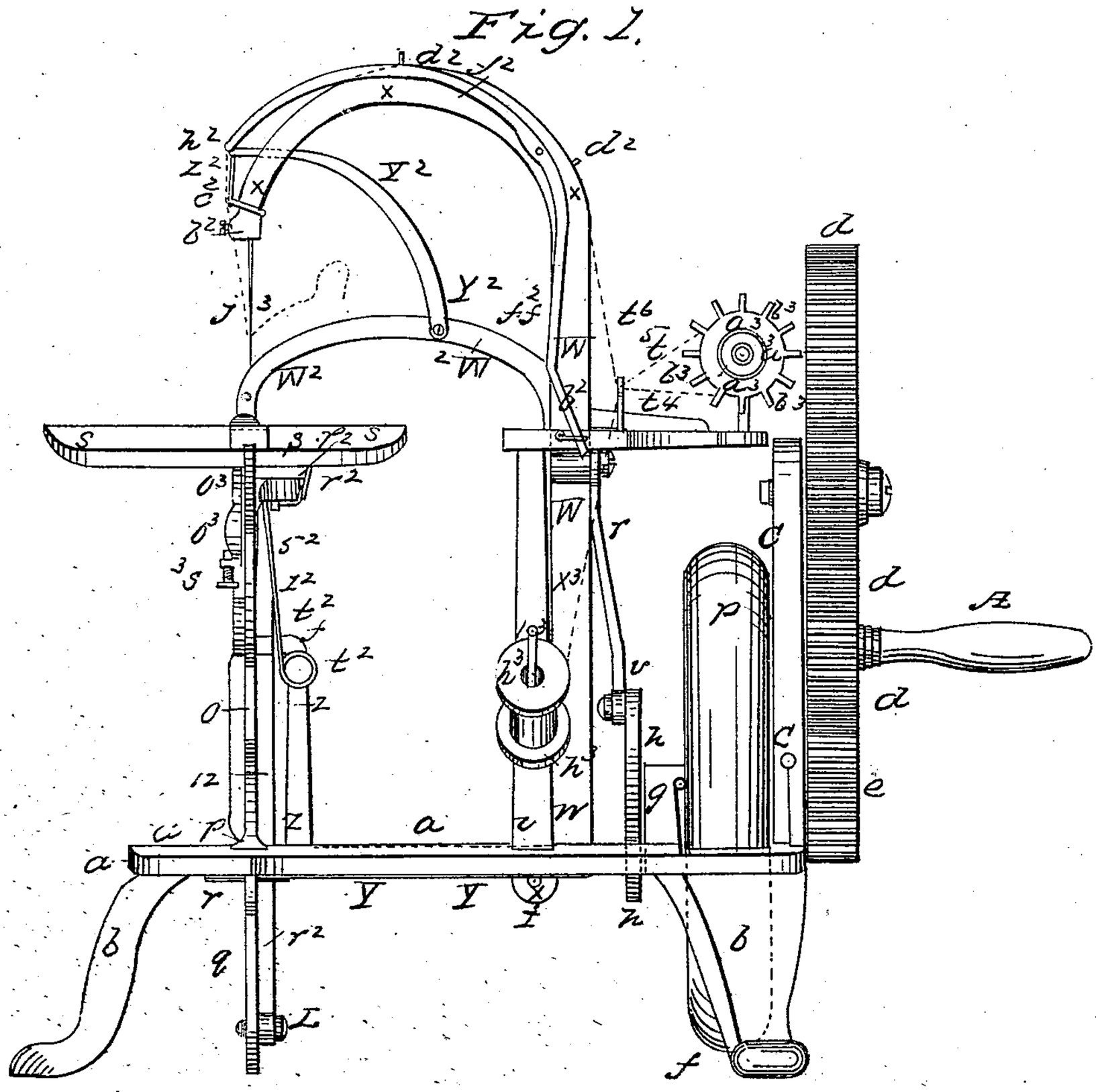
G. L. DULANEY.

Sewing Machine.

No. 37,617.

Patented Feb. 10, 1863.

Fig. 1.



Witnesses:

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Fig. 2.

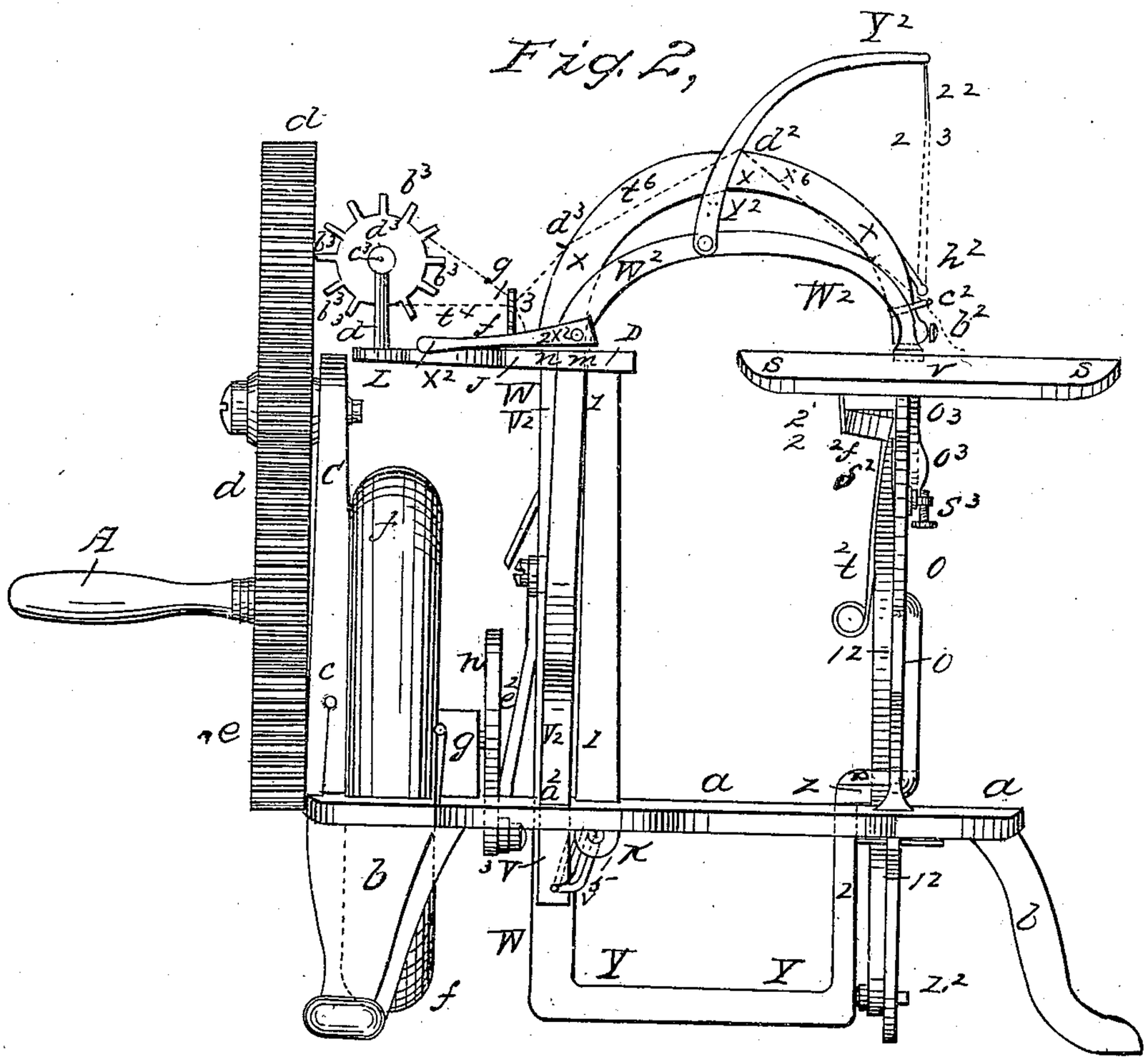

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Fig. 3.

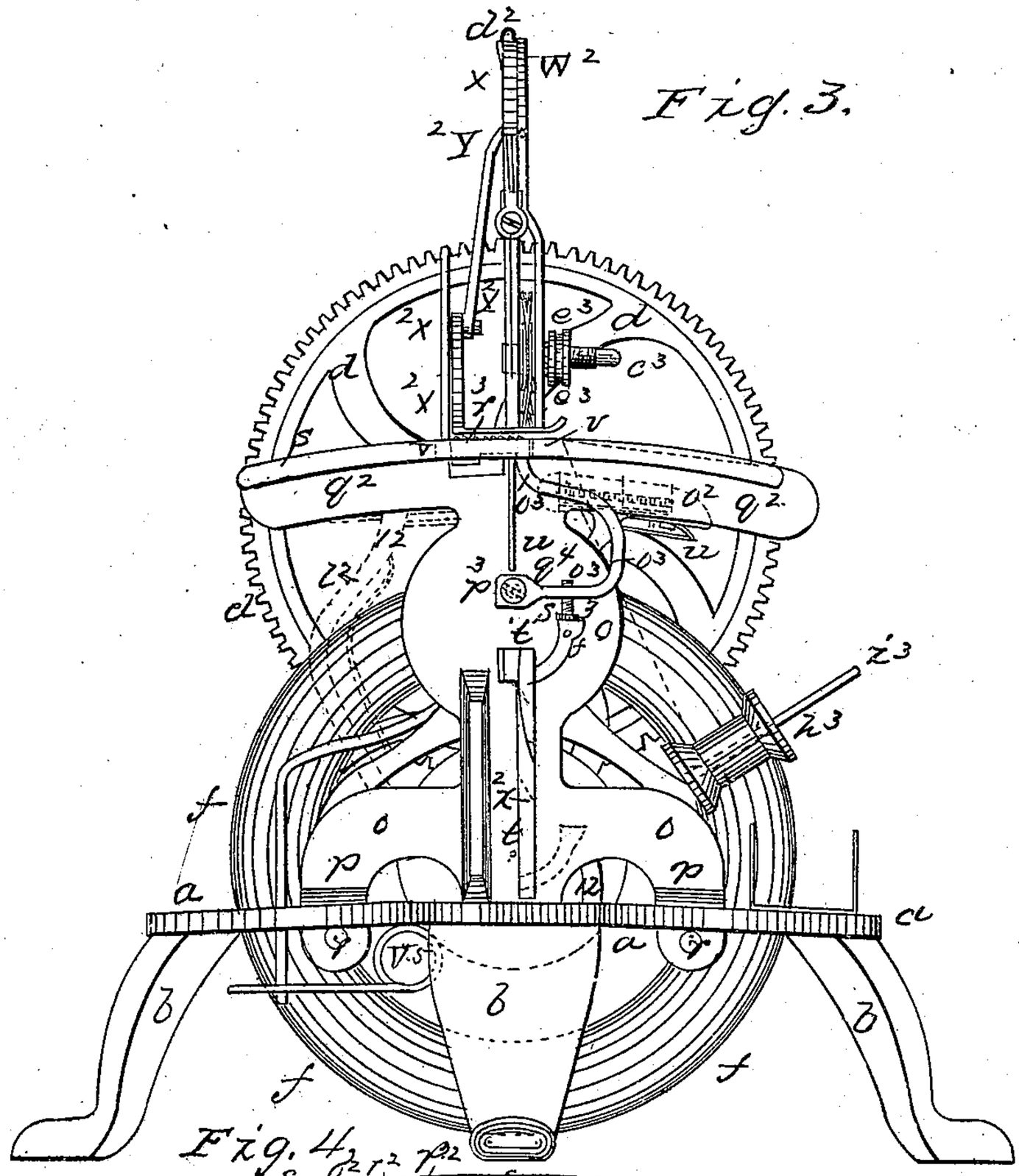


Fig. 4.

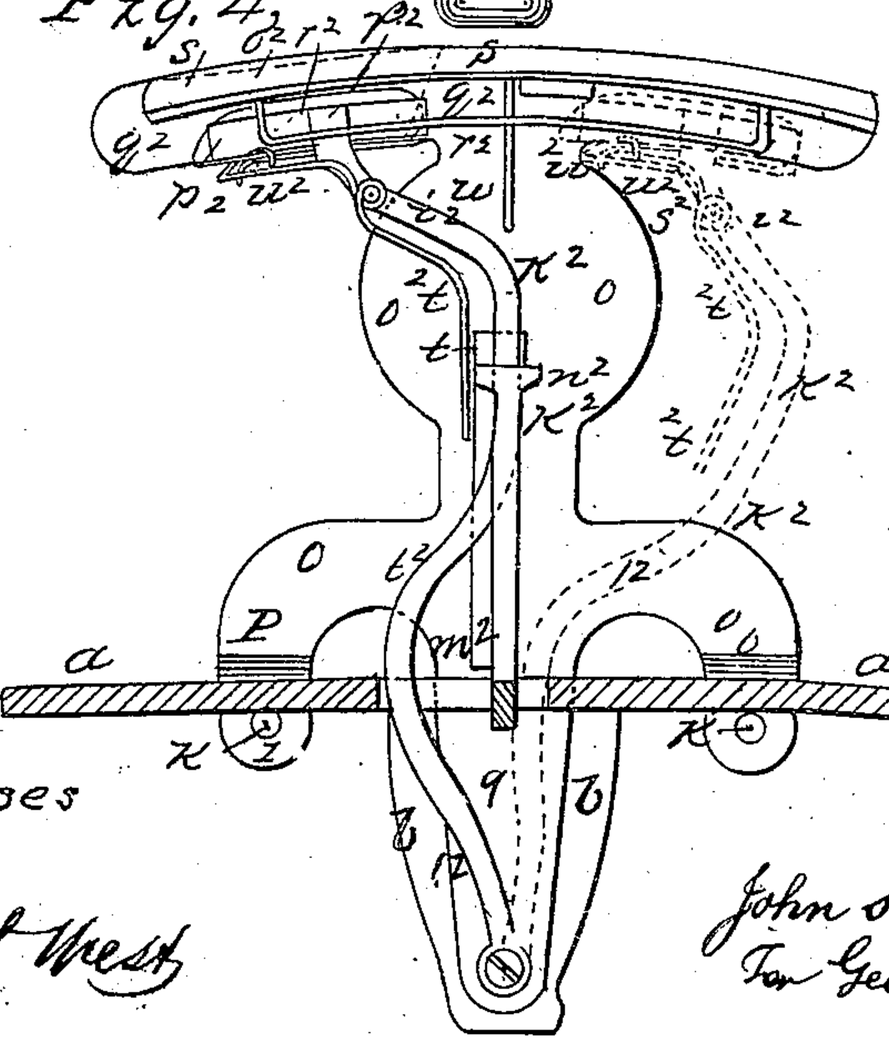
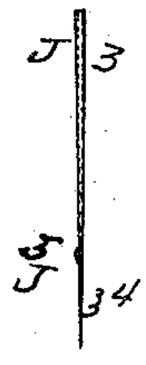


Fig. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE L. DULANEY, OF MOUNT JACKSON, VIRGINIA.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **37,617**, dated February 10, 1863.

To all whom it may concern:

Be it known that I, GEORGE L. DULANEY, of Mount Jackson, in the county of Shenandoah and State of Virginia, have invented and made certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a right-hand elevation of the machine. Figure 2 represents a left-hand elevation of the machine. Fig. 3 represents a front elevation of the machine. Fig. 4 represents a reverse view of the pedestal cloth-table, with shuttle and the peculiar shuttle-carrier and feed devices. Fig. 5 represents the needle detached.

The nature of my improvements relates more especially to the construction and operation of the needle-bar; secondly, to the manner of causing the feed motion; thirdly, to the manner of actuating the shuttle; fourthly, to the manner of causing the tension; fifthly, to the manner or mode of taking up the slack thread.

The better to enable others to construct and use my improvements, the following is a full description thereof:

At *a a a a*, Figs. 1 and 2, is represented a suitable bed-plate or platform, mounted, if desired, on suitable supports or legs, *b b b b*, or attached to any suitable stand or table to work the machine, if desired, by a treadle. To the platform is cast a standard, *c c*, to which is connected in suitable bearings the main cog-gear driving-wheel *d d* and the small pinion gear-wheel *e e*, both working into each other, and attached by their journals or axles on the outside of the standard. The axle of the small wheel or pinion extends horizontally through the standard, and the fly or balance wheel *f f* is confined on the axle of the pinion and on the inside of the standard *c c*, as shown in Figs. 1 and 2, the axle extending sufficiently to work through a short standard, *g*, and to the end of the axle, on the outside of the standard, is affixed a disk or circular plate, *h h*, the balance-wheel *f f* and the disk *h h* extending down through suitable openings formed in the bed-plate or platform *a a a a*.

At *i i i i*, Figs. 1 and 2, is shown a side view of a striding or arched-like standard, which is formed with a short arm, J. Said standard is detachable, and is confined in position by tenons in the bed-plate and keyed or pinned on the under side, as at K K. To the upper end of said standard is attached a cross-head piece, L L, formed with a mortise to fit over the short arm J. This short arm has two mortises formed on both sides, as indicated by the dots at *m n*, Figs. 1 and 2.

At O O is a pedestal-standard formed with shoulders P P and tenon ends keyed through the platform *a a*, as indicated at *r r r r*. This pedestal-standard has cast or formed onto its upper end a curved table-plate or cloth-support, *s s s s*, and is also formed with a larger longitudinal slot, *t t*, and a smaller slot, *w*. The cloth-support *s s* is formed with a slot, *v*, at the dots, Figs. 1, 2, 3.

At *w w* is indicated a vertically-arranged sliding needle-bar formed with an upper curved or arched like end, X X, and a lower elbow-like continuation, Y Y, with a forearm-extension, *z z*, and a finger-like extremity, & &. This peculiar needle-bar is formed of one continuous piece, its main length working vertically immediately behind the arched standard *i i*, Figs. 1 and 2, fitting in the mortises *m m n*, as dotted in Figs. 1 and 2, the elbow or lower portion, Y Y, and the forearm *z z* being fitted to work in notches in the platform, and indicated by dots a^2, the finger-like extremity & & being bent through the slot *t t* of the pedestal-standard *o o*. The needle-arm *w w* has its arched part formed with a head and set-screw to hold the needle, as indicated at b^2. On the end of the needle-bar is a small yoke-like device, c^2, formed with two small eyes on the left side and one eye on the right.

At e^2 e^2, Figs. 1 and 2, is indicated a suitable connection-rod, attached by its ends to the disk *h h*, and to the long arm of the needle-bar *w w*. On its left side of the arched part is attached by a small fulcrum or pivot a curved shape vibrating lever or slack-take-up device, f^2 f^2, with bent end g^2 and a small eye, h^2, formed through the upper end, as in Figs. 1, 2.

At i^2 i^2 is indicated the oscillating shuttle-driving lever, of curved shape, with a straight interval, K^2 K^2, Fig. 4. This shuttle-driver is formed with a shuttle-carrier, P^2 P^2, and is connected to the lower part, *g*, of the pedestal *o o* P P by a screw or pin-axis, L^2, Figs. 1, 2,

4, and, passing upwardly through a slot, m^2, rests within the fork or crotch n^2, Fig. 4, and continuing upwardly beneath the cloth-table *s s* to receive the shuttle o^2 o^2 within the carrier P^2 P^2 of the shuttle-driver i^2 k^2, the shuttle being held or supported laterally by the side of the race q^2 q^2, Figs. 3 and 4. The shuttle-carrier is also supported by a lateral guide bar or staple, r^2, Figs. 1, 2, 4. Attached by a suitable axis, s^2, to the side of the shuttle-carrier arm is a gravitating pendent shuttle-adjuster, t^2 t^2, formed with a bowed end, w^2, Figs. 3 and 4. This bowed end rests upwardly within a slot or a depression formed in the under side of the shuttle o^2, and indicated by dots in Figs. 3 and 4.

At O^3 O^3 is indicated the gravitating feed device of the curved shape shown, its butt end formed with an elongated opening, P^3, extending vertically, and through which passes the pivot or fulcrum-screw q^4, and whereby the feed device is attached to the outside of the pedestal *o o*, Fig. 3. The upper end of this feed device is serrated or notched, as indicated at r^3, Fig. 3, and works freely in the slot W of the cloth-table *s s*. Through the short curved end of the feed device O^3 O^3 is an adjusting or stitch-regulating screw, s^3.

At v^2 v^2 w^2 w^2 is indicated a curved and arched like vertically-arranged gravitating stripper-bar or pressure-pad, the lower end passing downwardly through the platform *a a*, as at v^3, and formed with a notch, V^4, in which, if found necessary, may be employed a suitable spring, V^5, to produce greater force or pressure of the pad against the material to be sewed. To this stripper bar or pad is attached a cam or eccentric-lever device, x^2 x^2, and at Y^2 is attached a suitable curved bar, to the end of which is a small dependent, z^2, formed of a length of flexible wire bent together, forming a small delicate fork-like device; or a solid strip of metal may be split longitudinally and the ends thereof opened or slightly extended so as to insure the desired purpose and to act as grip or take-hold, the particular office of which will be more fully explained hereinafter.

At a^3 a^3, Figs. 1 and 2, is indicated a circular rotating tension device formed of two similar thin flexible concave or dished disks provided with series of flexible radials b^3 b^3 b^3 at equal intervals apart. These two disks are both fitted together, their concave surfaces opposite thus forming a cavity between. Being thus fitted neatly though not solidly together a center hole or aperture is formed through their center by which the device is affixed to a horizontal spindle, c^3, formed with screw-thread, and said spindle is attached to the end of a vertical stud, d^3, which is inserted in the cross-head L L. On the horizontal spindle is a suitable nut or adjusting-tap, e^3. In the cross-head at f^3 is inserted a smaller stud, its upper end formed with an eye, g^3. At b^3 is indicated the spool of thread on the spindle i^3, inserted in the leg of the standard *i i*.

In my improvement to be operated by a treadle the platform *a a* is designed to be attached to a larger stand or table of any desired shape and size.

The operation of my improvements is as follows, viz: The material to be sewed is arranged on the table *s s*, so as to bear or press off forward and in front from the operator. The thread from the spool is carried in the direction indicated by the red dotted line t^3, and passed through the eye g^3 to the right, as at t^4, under and around and over the radials b^3 b^3 b^3 b^3 of the rotating tension a^3, then to the left downwardly, as at t^5, and returned through the eye g^3, and upwardly through the eyes d^2 d^2 of the needle-bar, thence on the inside through the first left-hand eye of the yoke-like device c^2 upwardly and through the eye h^2 of the vibrating lever or slack-take-up device f^2 f^2, thence downwardly on the right side and through both the outer holes of the yoke device c^2 c^2 to the left side, and finally into the eye of the needle J^3, Fig. 1. The machine being set in motion by the handle A A, the main wheel working into the pinion *e*, the whole mechanism is thereby set in motion, the disk *h h* communicating action to the connecting-rod e^2 e^2, which causes the needle-bar W W X X Y Y to slide up and down, when the needle J^3 descends, entering the material and passing entirely through it, extending below the cloth-table *s s*, so as to form the loop at the required time to admit the passage of the bobbin in the shuttle O^2 O^2.

In Fig. 1 the needle-bar W X Y Z is shown as being up in position to its extent, with the needle J^3 in position, ready to descend. The finger-like formation or feed-striker, &c., of the needle-bar W W is shown pressing up against the head of the screw s^3, which lifts the feed-bar o^3 o^3, pressing it upward and to the left at the same time against the material on the clotch-table *s s*, the gravitating stripper-bar or pressure-pad W^2 W^2 W^2 also pressing down on the top of the material.

It will be observed that in the extended position of the needle-bar the shuttle O^2 O^2 is to the left-hand edge of the cloth-table, and in position, as indicated in Fig. 4. As the needle-bar W X Y Z descends to its utmost position, as in Fig. 2, the needle is shown as having penetrated the material and extending through and beneath the cloth-table *s s* where the loop of the needle-thread being formed, the thread of the shuttle is passed through said loop, the shuttle being in position to the right, as indicated by the dotted representation of the shuttle-carrier P^2 P^2, Fig. 4, and thus as the needle alternatly enters the material and the shuttle passes to and from through the loop the threads are interlocked, the stitches formed and the sewing produced.

The peculiar features, however, of my improvements are the following: The needle-bar W X Y Z, &c., being formed of one continuous single piece of metal, and, because of its peculiar shape, made to perform the fourfold office of actuating the needle J^3, impelling the shut-

tle-driver i^2 K^2, operating the feed-bar device o^3 P^3, and also carrying with it and operating the vibrating lever or slack take-up f^2 f^2. This slack-take-up device f^2 thus connected on an axis to the side of the needle-bar moves therewith, and, in passing upwardly, the deflected end g^2 strikes against the small staple g^4, by which means the eye end h^2 of the same is raised or thrown upward, describing a short curve, and thereby drawing up the slack thread of the needle, so as to prevent undue length and spread of the loop. As the needle-arm descends the vibrating lever f^2 is carried down with it, the straight part $f f^2$ bearing against the small staple g^4, thus preventing further vibration until the needle-arm is again carried up.

It will be observed also that the shuttle-i^2 i^2 has a straight part, K^2, which is designed to cause a cessation or slight interval of motion of the shuttle, the object of which intermittent office is to keep the shuttle at rest sufficiently long to allow the needle to pass to its utmost extent without coming in contact with the shuttle.

With reference to my improved feed-motion device O^3 P^3 it will be observed that it is partly self-acting by its inherent gravity, and being suspended on its fulcrum by the elongated hole, having sufficient play up and down and laterally so as to describe somewhat of an oblique double movement, by which means the material being sewed is pressed upwardly against the pressure-pad W^2 W^2, and forward horizontally from the operator, and after thus moving and returning to its original position the feed device O^3 P^3 falls beneath the material, thereby releasing it at the required time, and thus alternately feeding the material regularly and affording the required stitch. This feed device may be so regulated by the set-screw s^3 as to give any desired length of stitch. Thus, for instance, if the screw s^3 is turned to the right, the stitch is shortened, and if to the left the stitch is lengthened, owing to the fingers & & continuing more or less against the screw.

Another feature of improvement is the pendent gravitating self-acting shuttle-adjusting device s^2 t^2 t^2, the object of which is to lift the shuttle slightly, and thereby accommodate the shuttle to the curved sweep or stroke of the shuttle-carrier P^2 P^2, and prevent any undue sweep or play of the shuttle in the race q^2 q^2, the bow part u^2 u^2 bearing up and within the slots or depression in the under side of the shuttle, as indicated at u^2 in dots, Fig. 4.

Another peculiar feature of my improvements is the little gripper or finger device z^2, Fig. 1, which is designed to grip or hold up the slack thread of the needle J^3, should there be too much slack tension. As the needle-bar W X Y moves upwardly the cross-thread in the front holes of the yoke device c^2 c^2 is forced between the grip ends, as at z^3, Fig. 2, and is held up until the needle withdraws from the material on the table s s, thus most effectually preventing any undue slack of the tension.

Another novel feature of improvement is the rotating radial tension device a^3 b^3 b^3, which is regulated by the set-screw or nut e^3 e^3, Fig. 3, which, being turned more or less, tightens the tension. By having the radials b^3 b^3 the thread is caught or held at intervals. Thus should any inequalities occur the tension is not interfered with, as would be the case if a continuous grooved disk or wheel were used, which method is employed in many improvements in sewing-machines; and another feature of my improvements is the shuttle, formed with a groove or a slot on its under side, as indicated by the line u^4, Fig. 4. This slot or depression is to receive the bowed adjuster u^2 u^2, so as to adjust the shuttle to its place, as hereinbefore alluded to.

Having set forth, shown, and described my several improvements in sewing-machines, and desiring to secure the same by Letters Patent of the United States, what I claim as of my own invention is as follows, viz:

1. The vertically-acting needle-arm composed of one piece of metal, as indicated at W X Y Z, &c., Figs. 1, 2, which performs the several different offices or mechanical functions as herein set forth and described.

2. The special construction of the intermittent-acting shuttle-carrier device i^2 k^2 p^2 r^2, Fig. 4, together with the gravitating self-acting shuttle-adjusting device s^2 t^2 w^2, Fig. 4, as shown and described.

3. The gravitating self-adjusting feed device o^3 o^3 p^3 q^4, Fig. 3, constructed and operated in the manner described.

4. The self-acting gravitating pad v^2 v^3 w^2 w^2, as constructed, and combined with the self-acting gravitating feed device o^3 o^3 p^3 q^4, the lever device x^2 x^2, and the curved bar or tension device y^2 y^2, with the small dependent flexible fork-like device v^2, Figs. 1, 2, 3, substantially as set forth, shown, and described.

5. Constructing the shuttle o^2 o^2 with the bottom slot or depression, o^4, Fig. 4, and the combination therewith of the gravitating self-acting shuttle-adjusting device s^2 t^2 w^2, Fig. 4, substantially as set forth and described.

6. The vibrating lever or slack-thread adjuster f^2 ff^2 g^2, Fig. 1, as constructed, operated, and combined with the needle-bar or arm W X Y Z, Figs. 1, 2, substantially as set forth and described.

7. The curved bar or tension devices y^2 y^2 z^2, Figs. 1, 2, 3, singly or in combination with the vibrating lever or slack-take-up device f^2 f^2 g^2 h^2, so as to produce the desired effect, in the manner as set forth, shown, and described.

8. The flexible rotating radial tension device a^3 b^3 c^3 d^3, Figs. 1, 2, as constructed, set forth, and described.

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Witnesses:
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