(No Model.)

5 Sheets—Sheet 1.

O. C. DOLLOFF.

SEWING MACHINE.

No. 488,964. Patented Dec. 27, 1892.

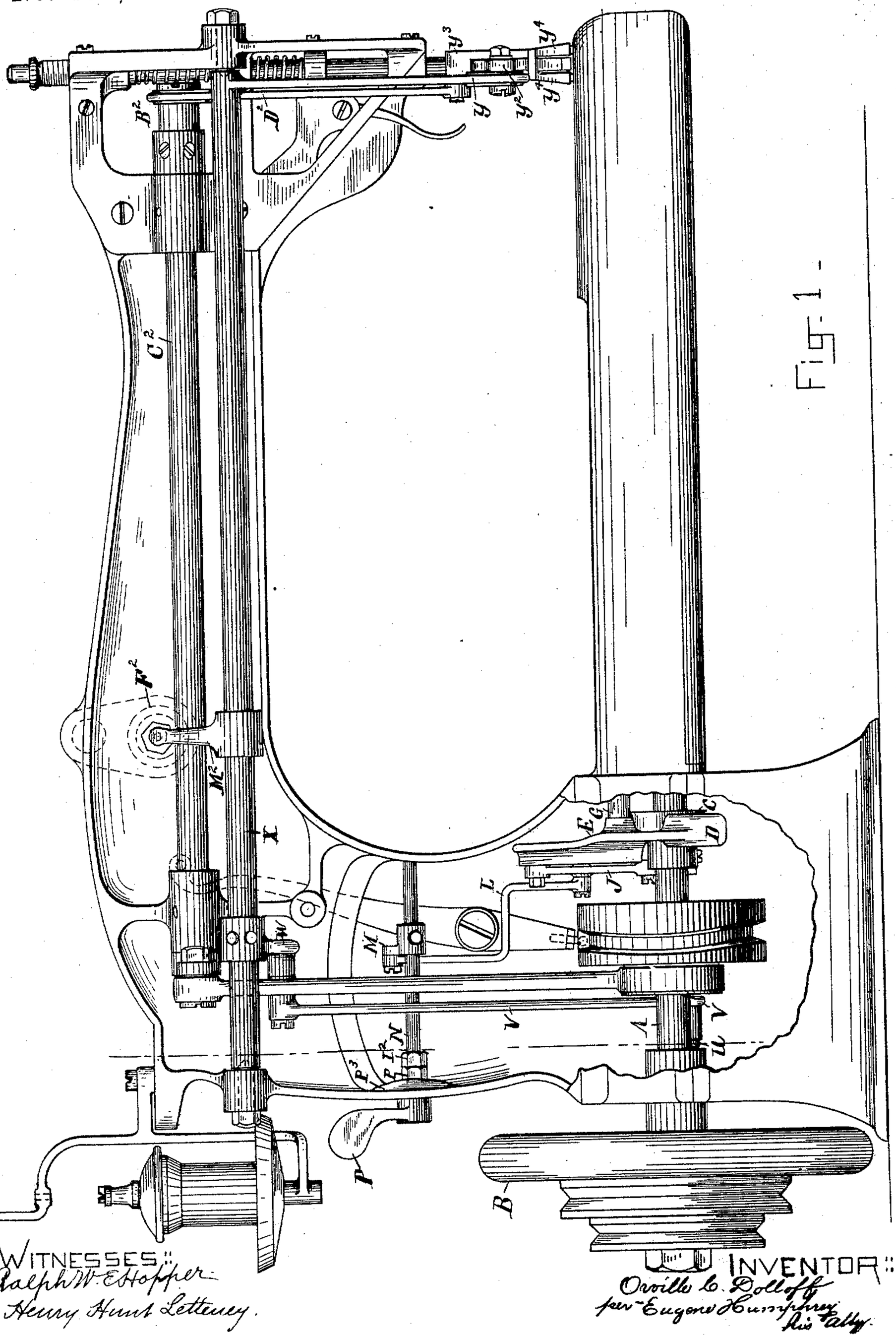

Fig. 1.

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INVENTOR:
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per Eugene Humphrey
his Atty.

(No Model.)

5 Sheets—Sheet 2.

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SEWING MACHINE.

No. 488,964. Patented Dec. 27, 1892.

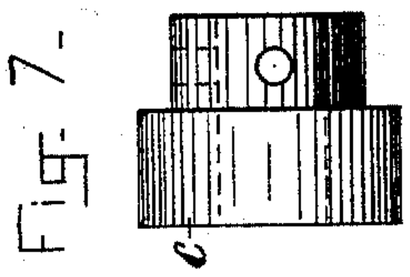

Fig. 7.

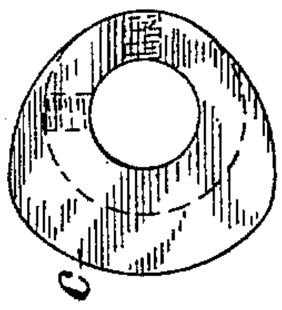

Fig. 6.

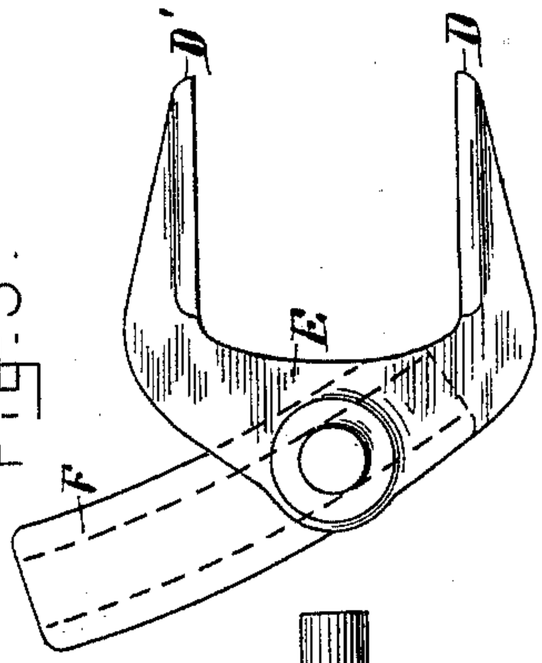

Fig. 5.

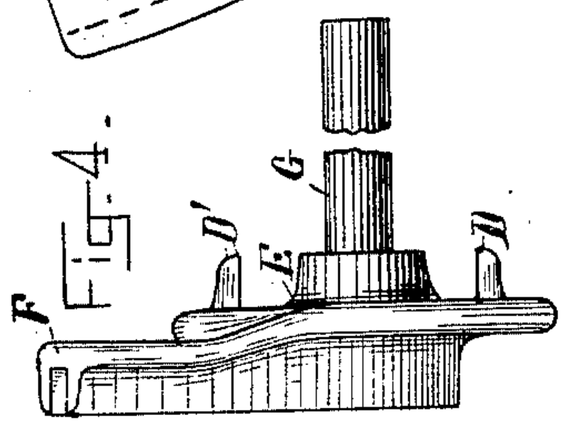

Fig. 4.

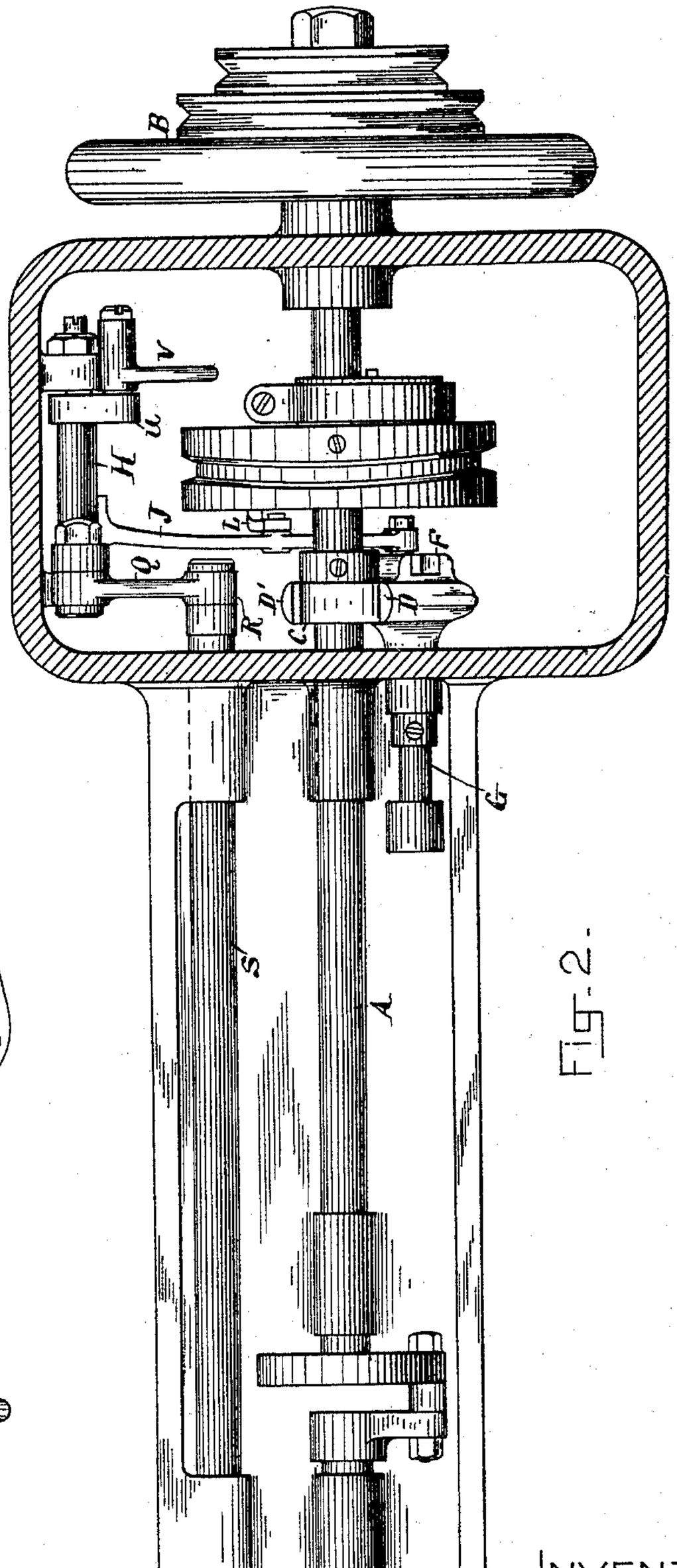

Fig. 2.

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(No Model.) 5 Sheets—Sheet 3.

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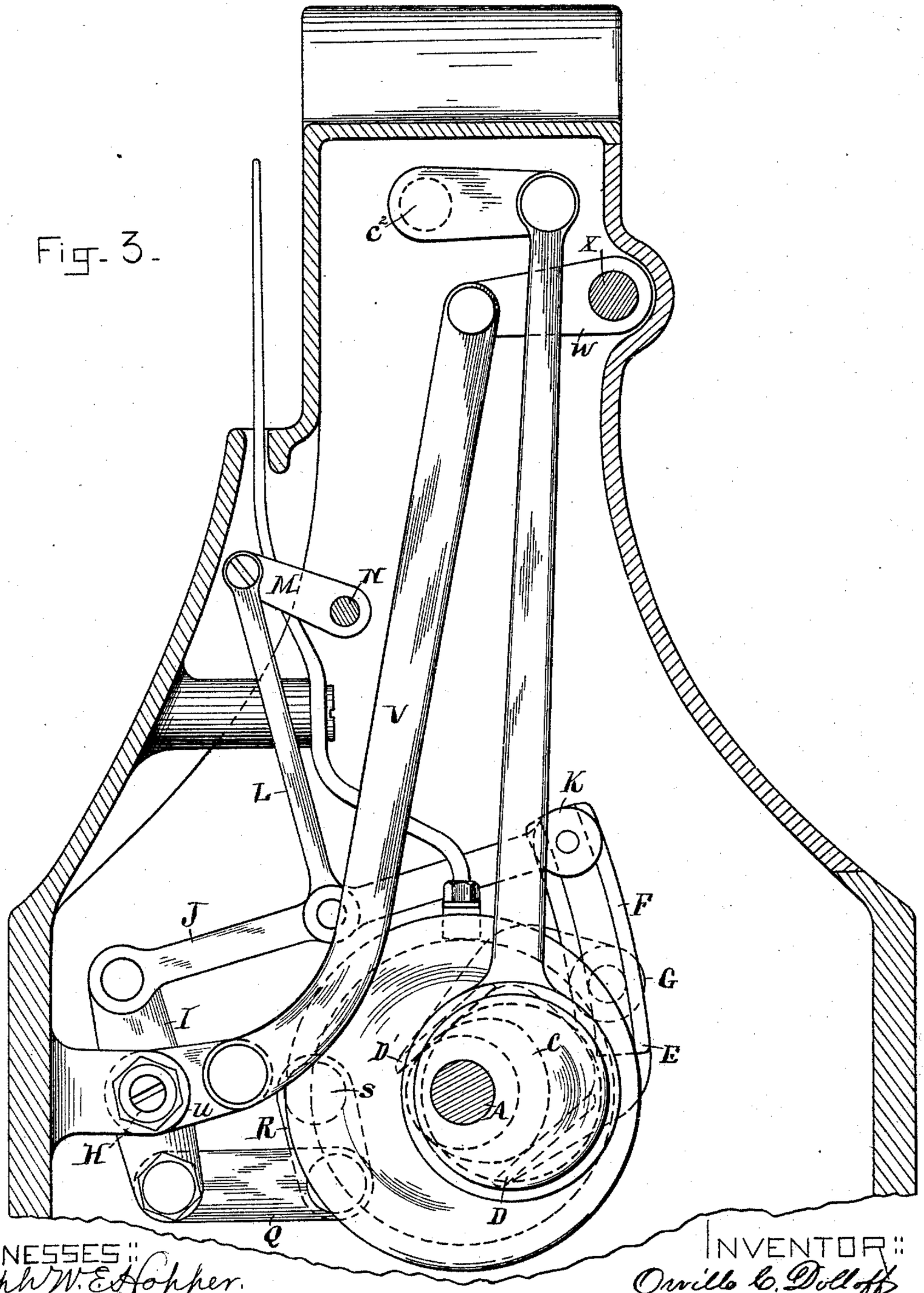
SEWING MACHINE.

No. 488,964. Patented Dec. 27, 1892.

Fig. 3.



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(No Model.) 5 Sheets—Sheet 4.

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SEWING MACHINE.

No. 488,964. Patented Dec. 27, 1892.

Fig. 8.

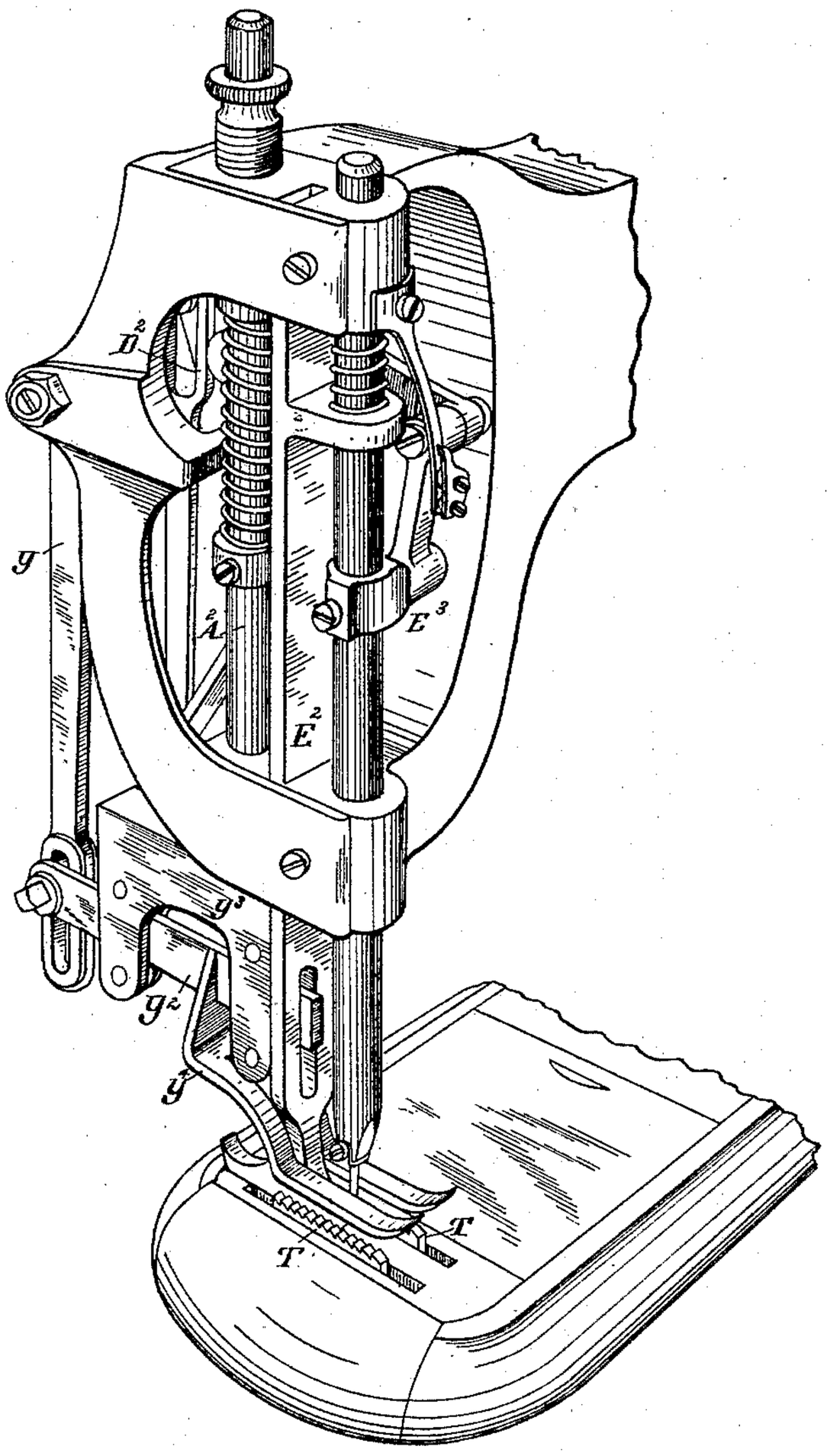
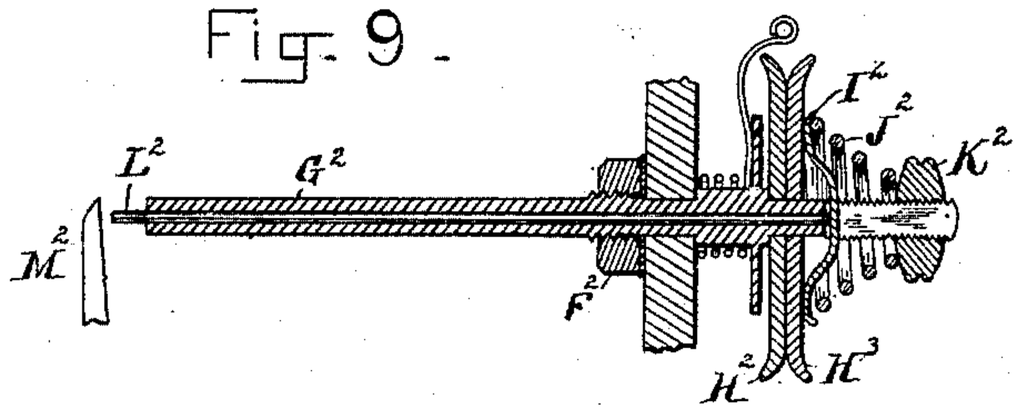


Fig. 9.



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(No Model.) 5 Sheets—Sheet 5.

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SEWING MACHINE.

No. 488,964. Patented Dec. 27, 1892.

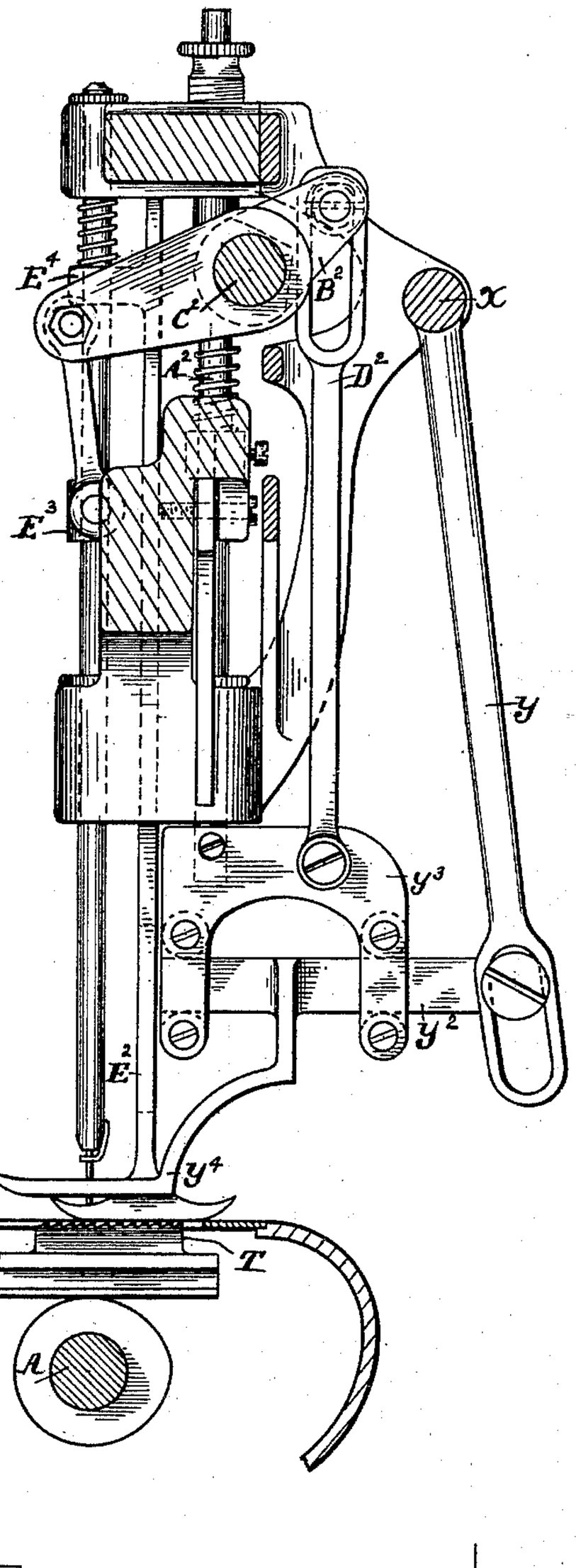

Fig. 10.

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UNITED STATES PATENT OFFICE.

ORVILLE C. DOLLOFF, OF CHELSEA, ASSIGNOR OF TWO-THIRDS TO JOHN GOETTEL, OF BOSTON, AND FRANK F. DENFELD, OF WESTBOROUGH, MASSACHUSETTS.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 488,964, dated December 27, 1892.

Application filed December 9, 1891. Serial No. 414,491. (No model.)

To all whom it may concern:

Be it known that I, ORVILLE C. DOLLOFF, of Chelsea, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Sewing-Machines, which will, in connection with the accompanying drawings, be hereinafter fully described, and specifically defined in the appended claims.

My invention relates to sewing machines for long stitch sewing, or "basting," and is an improvement upon the machine described in Letters Patent of the United States No. 377,888, issued to me and Rufus M. Eastman, February 14, 1888. And my present invention consists in the novel devices and combinations of mechanism by which the feeding of the material is effected and the tension upon the thread relaxed at the time the feed movement takes place, which are hereinafter fully described and specifically pointed out in the appended claims.

In the accompanying drawings: Figure 1, is a side elevation of a machine embodying my invention, with a part of the frame removed so as to show the principal operative parts as seen when looking at the back side of the machine. Fig. 2, is an underside view of the machine as viewed from the front when the machine is turned back upon the side shown in Fig. 1. Fig. 3, is a vertical section taken as on line *x x* Fig. 1, and as viewed from the left of said line. Figs. 4, 5, 6, 7, are details, giving enlarged views of detached parts which are shown in place in Fig. 2. Fig. 8, is a perspective view of the front end of the machine, showing the mechanism attached to the head of the machine, and the work-bed and its attachments. Fig. 9, is a vertical section through the center of the tension devices, and showing in side elevation, a detached portion of the arm which is attached to the upper rock shaft to act against the tension devices to relax the tension on the thread at times, as will be hereinafter explained. Fig. 10, is a vertical section through Fig. 1 taken as on a line just back of, or on the left of, the head in said figure, and as viewed from the left, and showing more clearly the connections between the upper feeding devices attached to the head, and their operative shafts.

It is not deemed necessary to particularly describe those parts of the machine which are not new, and they will therefore be only referred to in connection with new and more fully described parts. Upon the principal shaft A (Figs. 1 and 2) which is revolved through the usual wheel B, there is mounted a cam *c*, which is shown in both side and end view in Figs. 6 and 7. This cam *c* revolves between the jaws D and D′ of a lever E, which lever has also a slightly curved and grooved arm F, and is shown in enlarged side and front views in Figs. 4 and 5. Lever E is attached to a short rock shaft G secured in bearings on the underside of the machine bed as shown. As cam *c* is revolved with and by shaft A it imparts a rocking movement to lever E and shaft G, as will be readily understood from their relations to each other as shown in the drawings. In the base of the goose-neck is hung, in proper bearings, another short rock-shaft H, (Figs. 2 and 3,) upon which is mounted a lever I (Fig. 3) to the upper end of which is pivoted an arm J. The opposite end of arm J carries a stud and block K which is adjustable in groove F, and through which arm J is vibrated by lever E, to a greater or less extent according to the position of block K in groove F, relatively to the axis of shaft G. The adjustment of block K in groove F is effected through a bent rod L (Figs. 2 and 3) which is pivoted to the middle of arm J at its lower end, and to an arm M at its upper end, which latter arm is secured to a small shaft N, mounted in the neck of the machine and turned by a crank P, and when so turned to any desired position is secured in place by check-nuts P′ and P^2 turned against a spring washer P^3 as shown in Fig. 1. By turning crank P movement is imparted, through the described intermediate connections, to arm J, and its block K is thereby adjusted in groove F, nearer to or farther from the axis of shaft G, according to the direction in which, and the extent to which crank P is turned; and consequently when lever E is rocked on shaft G, by cam *c*, arm J will be caused to

vibrate longitudinally and to rock lever I to a greater or less extent accordingly as block K is nearer to or farther from the axis of shaft G. The lower end of lever I is connected by a link Q to an arm R (Figs. 2 and 3) which arm is secured to the rock-shaft S which actuates the feed bar T (Figs. 2 and 8). This feed bar is thus moved horizontally to a greater or less extent, and consequently makes a longer or shorter stitch when operating in connection with the stitching mechanism, according to the described adjustment of block K in groove F and the corresponding vibration of lever I. There is also upon rock-shaft H an arm u (Figs. 1 and 2) to which is pivoted a bent rod V which extends upward in the neck of the machine and is pivotally connected with an arm W on a rock-shaft X which extends horizontally from the rear to the front or head of the machine, as shown in Fig. 1.

To the front end of shaft X is rigidly secured a bar y, which extends downward, as shown in Figs. 1 and 8, and the lower end of which vibrates when shaft X is rocked. There is a vertical slot in the lower end of bar y, as shown in Fig. 8, and a horizontal bar y^2 is secured thereto by a screw-bolt passed through the bar and slot and secured by a nut as shown. The bar y^2 is arranged to move between trundles in a slotted block y^3, and to carry a split presser foot y^4 which is secured thereto, as shown in Fig. 8. The two parts of the presser foot y^4 rest down upon the two roughened surfaces of feed bar T which project above the work plate when in the act of feeding the material in the usual manner, and at such time foot y^4 is caused to move with the feed bar as an auxiliary, by bar y when vibrated by the rocking of shaft X, which latter movement is produced by cam c through the described connecting devices, and is properly timed relatively to the movements of the stitching devices. The block y^3 is secured to the presser-bar A^2, which is held down by spring pressure in the usual manner and as shown in Fig. 8. And is raised at the proper times by a lever B^2 on the front end of the rocking needle-bar shaft C^2 which lever extends backward and works in a slot in the upper end of a lifting bar D^2 which at its lower end is screwed to the block as shown in Fig. 1. Lever B^2 is timed in its movement so that it raises block y^3, bar y^2 and foot y^4 during the retractive movements of bar T and foot y^4, and drops them for foot y^4 and bar T to make their joint forward feed movement in the time required. A pressure bar E^2 is employed in the usual manner, the foot of which rests upon the material on the work plate between the branches of foot y^4, as shown in Fig. 8, and is held down by a spring coiled about the needle-bar as shown, and serves to keep the material in place during the retractive movement of the bar T and foot y^4. This presser foot E^2 is raised when the needle-bar ascends, by contact of the collar E^3 attached to the bar, with projection E^4 on the bar E^2; and this lifting of the foot E^2 occurs at the time that foot y^4 drops onto the material, and after the feed movement takes place and foot y^4 is about to rise again, then foot E^2 drops into place on the material.

It is desirable for the purposes of this machine that, when the forward feed movement of the material takes place, all tension on the thread should be automatically relaxed, and I accomplish this object in the following novel manner: I employ a tension device attached to the neck of the machine as indicated at F^2 Fig. 1, and comprising the parts shown in Fig. 9, namely:—a hollow stud G^2 secured in the neck of the machine; two disks H^2, H^3 mounted on said stud; a spring disk I^2; a spring J^2; a nut K^2 threaded onto the outer end of the hollow stud to compress the spring; and a needle L^2 extending into the hollow stud and resting against disk I^2 at its inner end, and extending outward slightly beyond the end of the stud. Upon shaft X is a finger M^2 arranged to rock with the shaft, as shown in Fig. 1, and to come, at the proper times, into contact with the projecting end of needle L^2 shown in Fig. 9. This contact is timed to take place when the feed movement begins, and by the action of finger M^2 rocked by shaft X, needle L^2 is forced into the hollow stud and against disk I^2, thereby overcoming the pressure of spring J^2 and relieving disks H^2 and H^3 therefrom and thus relaxing the tension upon the thread held between said disks, and leaving it free to be drawn forward by the movement of the material under the action of the feeding devices described: the rocking of the finger being properly timed to accomplish the object desired, and then to restore the tension by withdrawing from the end of the needle.

The stitching mechanism in this machine being substantially the same as that in the former patent hereinbefore referred to, and not in and of itself forming any part of my present invention, a detailed description thereof is omitted.

The described feeding mechanism by which the under feed bar T and the upper auxiliary foot y^4 are brought together and clamp the materials between them, and are caused to move simultaneously in parallel lines, and by one and the same actuating cam on the driving shaft, and the construction by which the tension on the thread is also relaxed during the feed movement, together work very advantageously on the various kinds and thicknesses of material, and effect an even and uniform movement of the several thicknesses when advanced by the feeding devices.

I claim:

1. The combination of cam c revolved by shaft A; rock-shaft G actuated by said cam through lever E; lever E having a grooved arm F; adjustable arm J connected with groove F and with arm I on rock-shaft H; rock-shaft H connected by arm I, link Q and

arm R with rock-shaft S; rock-shaft S and bar T whereby movement is imparted to bar T as and for the purposes specified.

2. The combination of rock-shaft H and its described actuating mechanism; arm *u* attached to said shaft; rod V pivotally secured at its lower end to arm *u* and at its upper end to arm W on shaft X; shaft X; bar *y* rigidly secured to shaft X; bar y^2 attached to bar *y* and fitted to slide in block y^3 and carrying foot y^4; block y^3 attached to bar A^2; and bar D^2 attached to block y^3 and actuated by shaft C^2, whereby movement is imparted to foot y^4 as and for the purposes specified.

3. The combination with feed bar T and means for actuating the same of cam *c* revolved by shaft A; grooved lever E mounted upon rock-shaft G and actuated by cam *c*; rock-shaft H connected with lever E by arms I and J; arm J connected with arm M upon shaft N; and crank P attached to shaft N, whereby the arm J is adjusted in its connection with groove F in lever E so as to vary the extent of vibration of shaft H and its connections, as and for the purposes specified.

4. In combination with bar T and foot y^4 and their actuating mechanism, for giving the four feed motions to both the finger M^2 secured to rock-shaft X; spindle L^2 inserted in stud G^2 secured in the frame of the machine; disk I^2; disks H^2 and H^3; spring J^2, and nut K^2; whereby the tension of the thread is automatically relaxed during the time that bar T and foot y^4 are feeding the goods, as specified.

ORVILLE C. DOLLOFF.

Witnesses:
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RALPH W. E. HOPPER.