

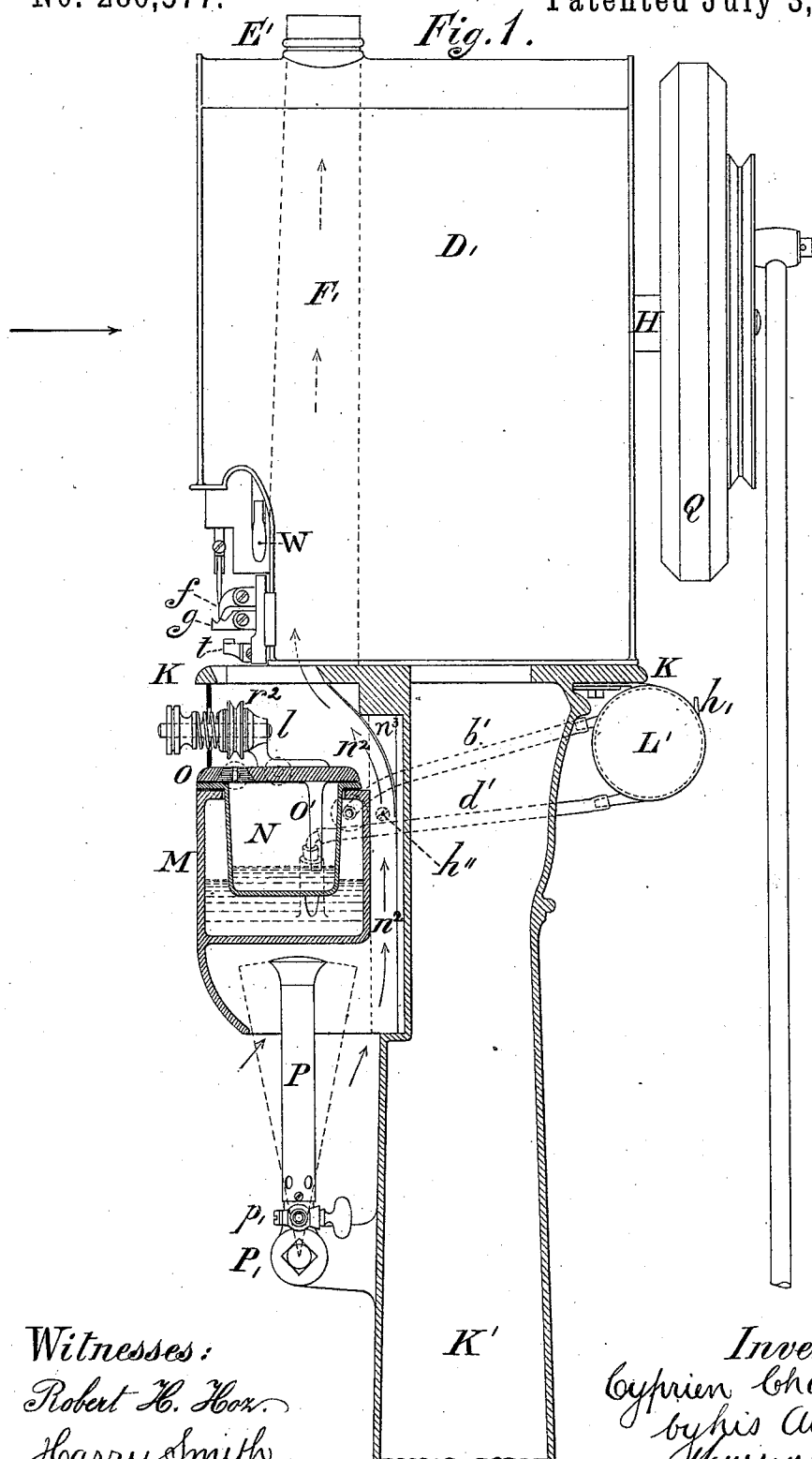
(No Model.)

6 Sheets—Sheet 1.

C. CHABOT.
SEWING MACHINE.

No. 280,577.

Patented July 3, 1883.



(No Model.)

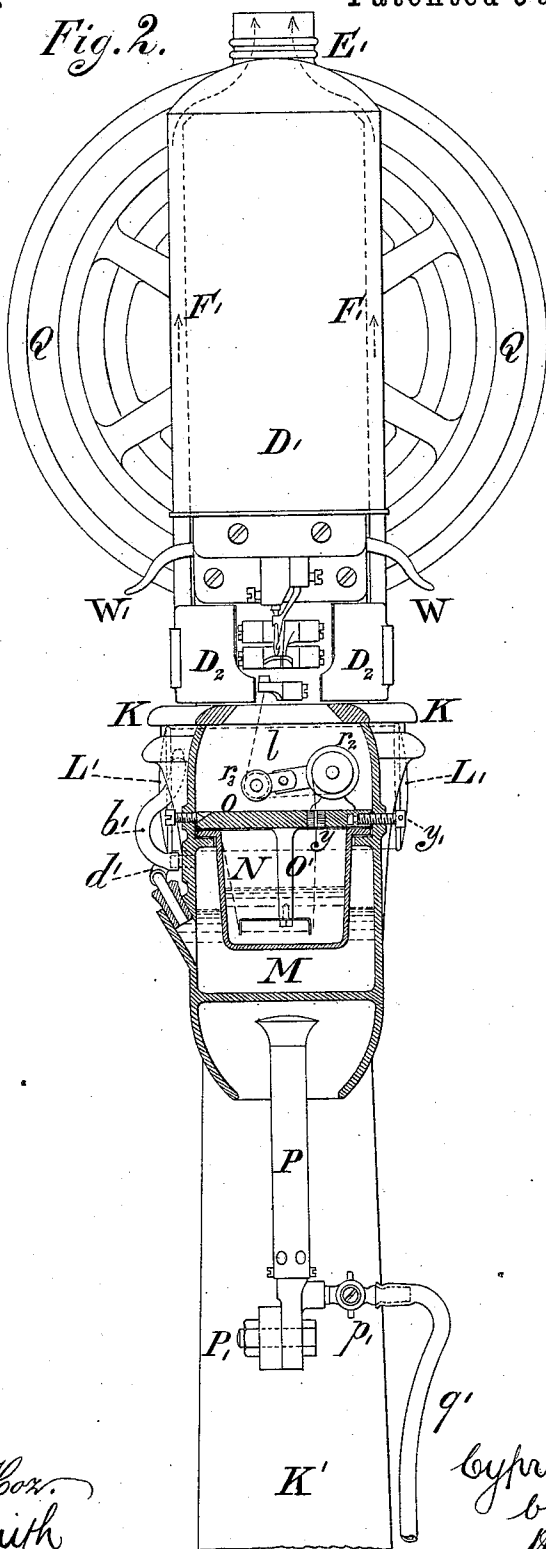
6 Sheets—Sheet 2.

C. CHABOT.
SEWING MACHINE.

No. 280,577.

Patented July 3, 1883.

Fig. 2.

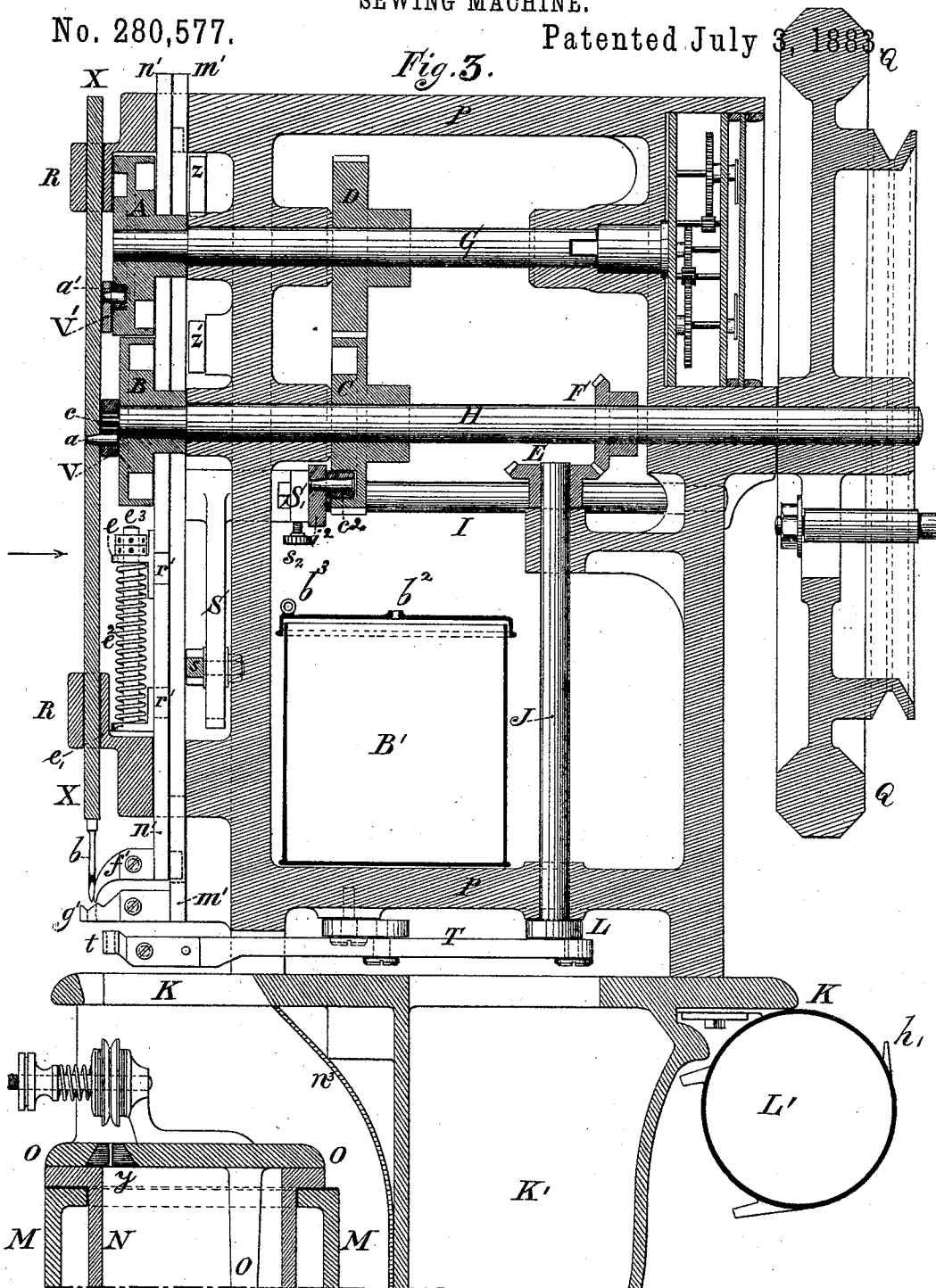



Witnesses:
Robert H. Hox.
Harry Smith

Inventor:
Cyrien Chabot
by his Attorneys
Howson & Son

6 Sheets—Sheet 3.

No. 280,577.

Patented July 3, 1883 

Witnesses:

Robert H. Cox.
Harry Smith

Inventor:
Cyrien Chabot
by his Attorneys
Houson & Son.

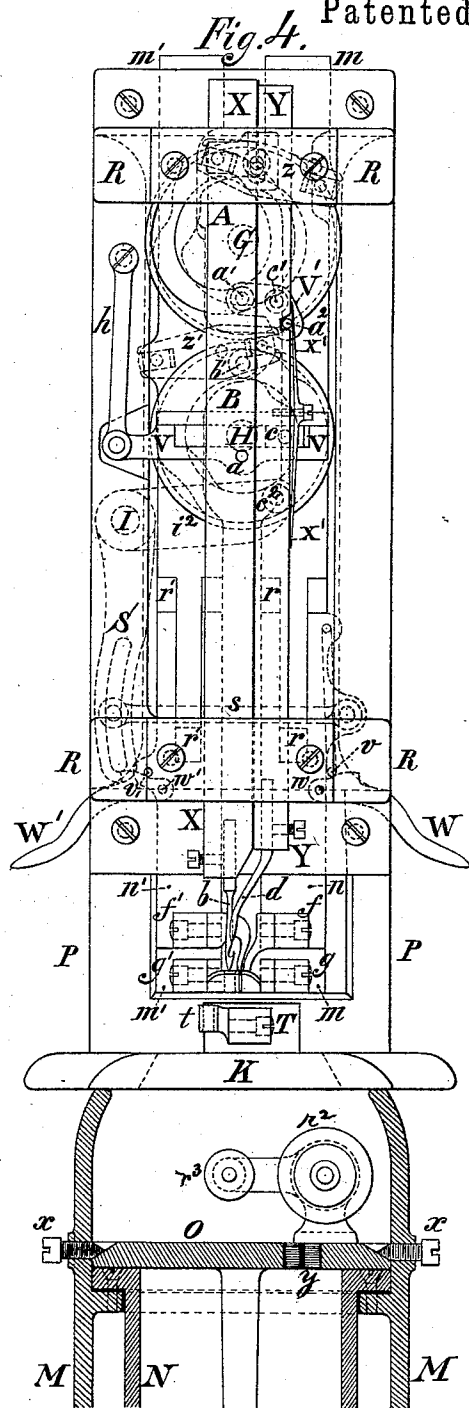
(No Model.)

6 Sheets—Sheet 4.

C. CHABOT.
SEWING MACHINE.

No. 280,577.

Patented July 3, 1883.



Witnesses:
Robert H. Hox.
Harry Smith

Inventor:
Cyprien Chabot
by his Attorneys
Howson & Son

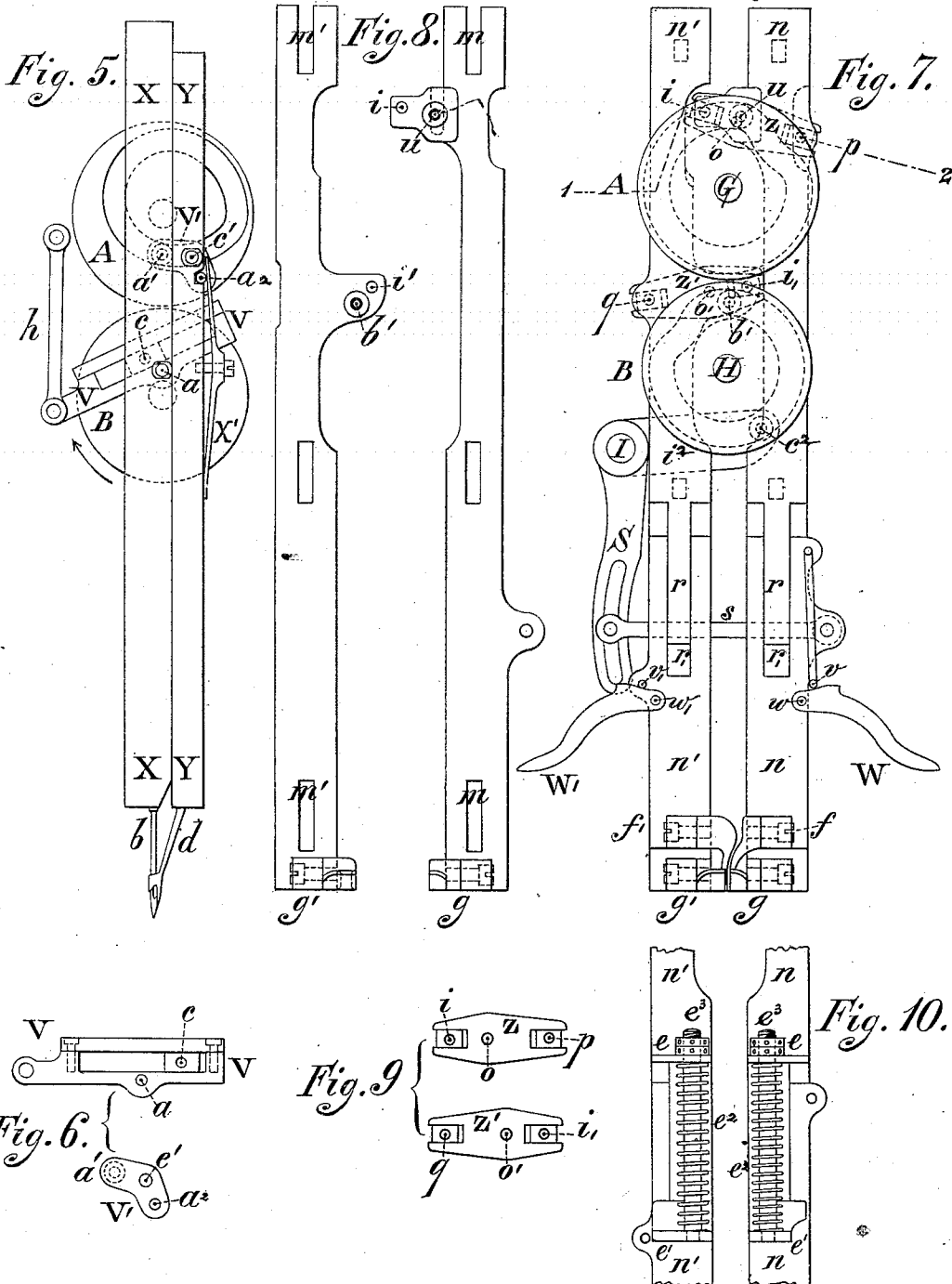
(No Model.)

6 Sheets—Sheet 5.

C. CHABOT.
SEWING MACHINE.

No. 280,577.

Patented July 3, 1883.



Witnesses:
Robert H. Fox.
Harry Smith

Inventor:
Cyprien Chabot
by his Attorneys
Howson & Son

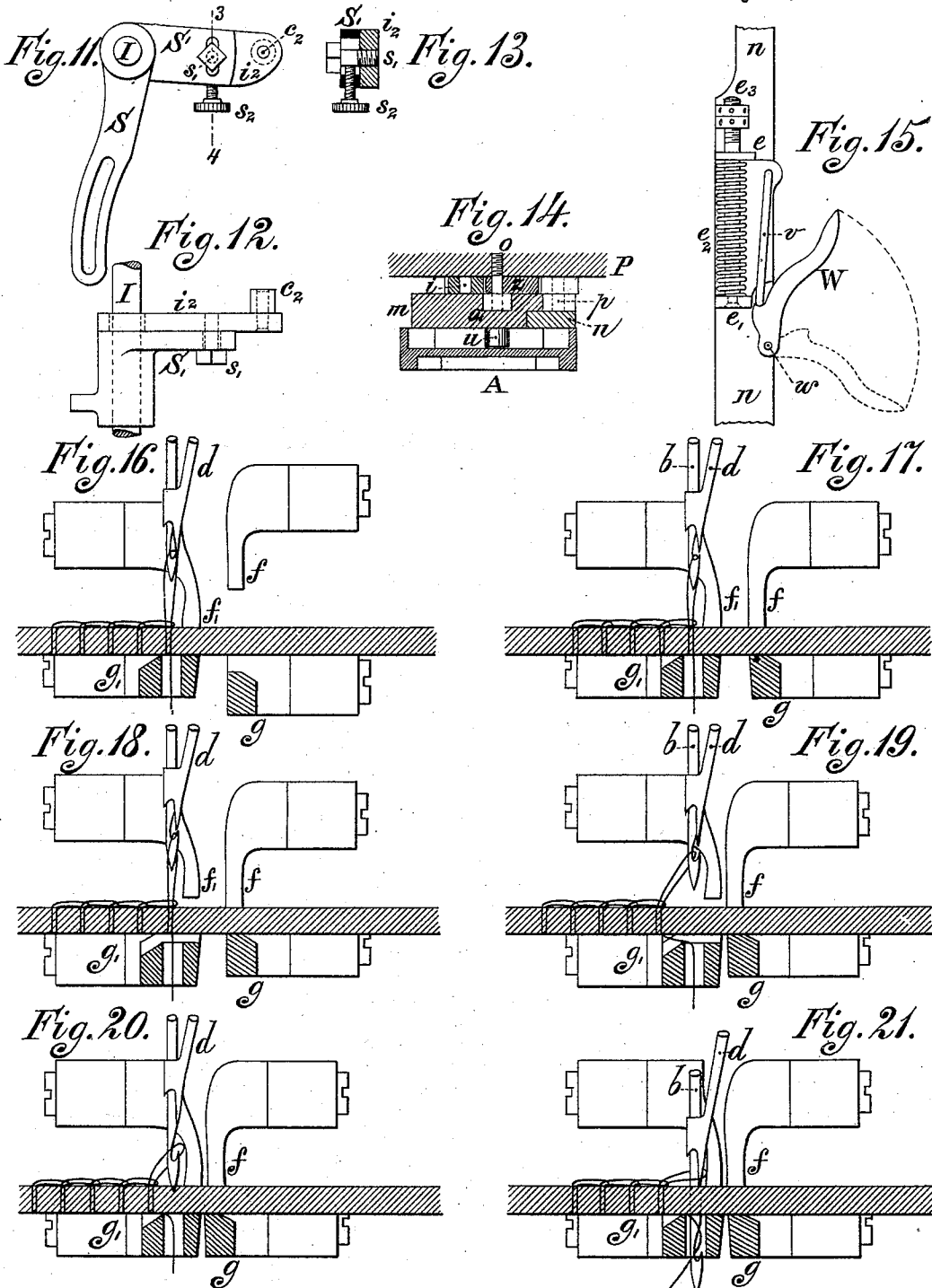
(No Model.)

6 Sheets—Sheet 6.

C. CHABOT.
SEWING MACHINE.

No. 280,577.

Patented July 3, 1883.



Witnesses:
Robert H. How,
Harry Smith

Inventor:
Cyrien Chabot
by his Attorneys
Howson & Son

UNITED STATES PATENT OFFICE.

CYPRIEN CHABOT, OF PHILADELPHIA, PENNSYLVANIA.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 280,577, dated July 3, 1883.

Application filed August 23, 1880. (No model.)

To all whom it may concern:

Be it known that I, CYPRIEN CHABOT, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Sewing-Machines, of which the following is a specification.

My invention relates to improvements in that class of machines intended for sewing shoes or other heavy work, the improvements embracing certain novel features, the character and objects of which are too fully set forth in the following detailed description to need preliminary explanation.

In the accompanying drawings, Figure 1, Sheet 1, is a side view, partly in section, of my improved sewing-machine; Fig. 2, Sheet 2, a front view of the same, partly in section, and looking in the direction of the arrow, Fig. 1; Fig. 3, Sheet 3, a longitudinal section of the upper portion or head of the machine, on a larger scale than Figs. 1 and 2; Fig. 4, Sheet 4, a front view, partly in section, of Fig. 3, looking in the direction of the arrow; Figs. 5 to 10, Sheet 5, and Figs. 11 to 15, Sheet 6, detached views of parts of the machine, illustrating the detailed construction of said parts; and Figs. 16 to 21, inclusive, Sheet 6, diagrams illustrating the operation of the machine.

The frame P of the upper portion or head of the machine is mounted upon a table, K, forming part of a hollow column or standard, K', and has bearings for the main driving-shaft H, the counter-shaft G, and the vertical shaft J, the counter-shaft being driven from the main shaft H through the medium of cog-wheels C D, and the shaft J being also driven from said shaft H through the medium of bevel-wheels E F. The shaft H has at the rear end a fly-wheel, Q, which is furnished with a grooved pulley and a crank-pin, the pulley receiving a belt from an adjacent shaft when the machine is driven by steam-power, and the crank-pin being connected by a pitman to a treadle suitably located when foot-power is the driving force. The front end of the shaft H is provided with a disk, B, on the outer face of which is a crank-pin, c, and to the latter is pivoted a block adapted to a slotted arm, V, hung by means of a link, h, to the frame P, an opening in said arm V being adapted for the reception of a pin projecting from the rear of the needle-bar X, which is

provided with a barbed or hooked needle, b, and slides in bearings formed in the frame P and in transverse retaining-strips R, bolted to said frame. As the disk B is rotated a vibrating movement is imparted to the arm V and a vertical reciprocating movement to the needle-bar X, the connecting-link h permitting the lateral movement of the arm V, necessitated by the direct vertical movement of the needle-bar. (See Figs. 3, 4, and 5.)

It will be observed on reference to Fig. 5 that as the disk B turns in the direction of the arrow a rapid elevation of the needle-bar X and a much slower depression of said bar are effected, the elevation of the bar occurring while the crank-pin occupies a position nearer to the pivot of the lever V than that occupied while the downward movement is being imparted to the said bar. The elevation of the needle-bar is effected, moreover, while the crank-pin is traversing considerably less than one-half of its circular path, the balance of the movement being devoted to the depression of the bar. By this means ample time is afforded for effecting the feeding and gripping of the work, as described hereinafter, and the needle is not thrust through the work at such a high speed as to cause it to become heated and interfere with the operation of the machine, the greatest power being applied to the needle-bar when the needle is penetrating the work. In fact, the power is so distributed that the effective operation of the needle is insured without limiting the speed of the machine or interfering with perfect ease of movement.

Immediately alongside of the needle-bar X, and guided in the same manner as the latter, is a bar, Y, which carries at the lower end the cast-off finger d. Hung to the inner side of this bar Y, near the upper end of the same, is a bell-crank lever, V', one arm of which is provided with a pin, a', having a roller adapted to a cam-slot in the outer face of a disk, A, secured to the front end of the shaft G, the other arm of said lever V' having a pin, a'', adapted to a recess in the edge of the bar Y, and maintained in position within said recess by means of a spring, X', secured to the edge of the bar Y by a set-screw, by tightening or loosening which the tension of the spring may be regulated. (See Fig. 5.)

Under ordinary circumstances the tension

of the spring is greater than the force necessary to effect the vertical reciprocation of the cast-off bar, and consequently the pin a^2 is kept firmly pressed in the recess of the bar, and the lever V' prevented from turning on its pivot c' under the action of the cam A, the lever in effect forming a rigid portion of the bar Y. When there is any undue resistance to the downward movement of the bar, however, the tension of the spring X' is overcome, and the lever V' turns on its pivot c' when the pin a' is depressed by the cam A.

It will be observed that the cast-off bar is operated independently of the needle-bar, whereby I am enabled to impart a positive movement to the said cast-off bar, and to so regulate the character of this movement in respect to that of the needle-bar that the action of the cast-off finger will be more perfect than in machines in which the cast-off bar relies for its movement on the needle-bar. In the latter case the cast-off finger moves at the same rate of speed as the needle, and the upward movement of said finger is exactly the reverse of the downward movement, both as regards the speed of the movement and the time at which it takes place, whereas in my machine the speed at which the cast-off finger moves is entirely independent of the speed of the needle, and the character of the movement may be varied as the work to be performed suggests.

The feeding devices of the machine comprise two bars, m and n , provided with claws for gripping the work, and combined with mechanism whereby said bars are reciprocated vertically and vibrated laterally, as described hereinafter. The bar m has at the lower end a claw, g , and the bar n has a claw, f , these claws being so shaped in the present instance as to receive and retain the channeled edge of a shoe-sole; but the character of the jaws may vary in accordance with the nature of the material which is to be sewed. The bar n is arranged directly in front of and in contact with the bar m , and lugs on the bar n are adapted to vertical slots in the bar m , (see Fig. 8 and dotted lines, Fig. 3,) so that while independent vertical movement of the bars is permitted there can be no lateral vibration of one bar independently of the other. The vertical reciprocation of the bars is effected by means of a cam-slot in the inner face of the disk A, said slot being adapted for the reception of an anti-friction roller carried by a stud, u , on the face of a projection formed near the upper end of the bar m , as shown in Figs. 8 and 14. This projection has a pin, i , which carries a block adapted to a slot in one arm of a lever, z , pivoted by means of a pin, o , to the frame P, the opposite arm of said lever having a slot for the reception of a pivoted block on a pin, p , projecting from the inner side of the bar n , a recess being formed in the edge of the bar m for the reception of said pin. (See Figs. 8 and 14.)

The action of the cam-slot of the disk A is

to raise and lower the bar m , such movement being transmitted by the lever z to the bar n , the movements of which, however, are the reverse of those imparted to the bar m —that is to say, as the latter bar is depressed the bar n rises, and vice versa—so that as the disk A rotates, the gripping-claws $f g$ are opened and closed at regular intervals. The extent of movement of the bar n in respect to that of the bar m and the relative speed of the movements of the bars depend upon the relation of the pivot-pin o to the center of the lever z . As shown in the drawings, the pivot-pin is so arranged that the extent of movement of the bar n and the speed at which it moves are somewhat greater than those of the bar m . The pivot-pin o projects beyond the face of the lever z , and carries an anti-friction block, o' , which is adapted to a vertical slot in the rear of the projection on the bar m , as shown in Figs. 8 and 14, this pin serving as a pivotal point on which the bars vibrate in effecting the feeding of the work.

The bars m and n are vibrated by means of a cam-slot in the outer face of the cog-wheel C, Fig. 3, said cam-slot being adapted for the reception of an anti-friction roller carried by a pin, c^2 , on an arm, i^2 , which is loosely hung to a longitudinal shaft, I, adapted to bearings at one side of the machine, a sleeve secured to this shaft having two arms, S and S', the former of which is slotted for the reception of a pin at one end of a link, s , the opposite end of which is connected to a lug on the bar m . The arm S' is adjustably connected to the arm i^2 , as shown in Figs. 11, 12, and 13, on reference to which it will be observed that the arm S' is slotted for the reception of a bolt, s' , which is adapted to a threaded opening in the arm i^2 , and has a head bearing on the arm S'. A set-screw, s^2 , passes vertically through the arm S', and bears upon the bolt s' , so that upon loosening the said bolt and manipulating the set-screw the arm S' may be adjusted in respect to the arm i^2 , and secured in position, after adjustment, by again tightening the bolt. The object of this adjustable device is to govern with nicety the position of the gripping-claws f and g when they have finished their forward or feeding movement, it being advisable to move said claws as closely as possible to the needle in feeding. When the claws or other parts of the machine become worn to such an extent that the claws do not approach the needle in feeding, the defect may be remedied by a slight adjustment of the arm S' in respect to the arm i^2 . It should be understood that this adjustment is entirely independent of that which governs the extent of vibration of the feeding-claws and the length of stitch, said adjustment being effected by moving the pin on the end of the link s in the slot of the arm S to a point more or less remote from the center of vibration of said arm.

In order to permit the work to be freed from the grip of the claws $f g$ at any time during

the operation of the machine, and also to adapt the claws to the feeding of material of different thicknesses, I make the bar *n* in two parts, the upper part receiving the reciprocating movement, and the lower part carrying the claw *f*. The lower part of the bar has a slot, *r'*, for the reception of a tongue, *r*, on the upper part of the bar, (see Fig. 7,) and between lugs *e e'* on the two parts of the bar is confined a spring, *e²*, the tendency of which is to force the lower part of the bar downward—a tendency which is restricted by the contact with the lug *e* of a pair of jam-nuts on the threaded upper end of a rod, *e³*, which projects through the lug *e*, the lower end of said rod being secured to the lug *e'*, as shown in Fig. 10. By manipulating the nuts on the upper end of the rod *e³* the lower or adjustable part of the rod *n* may be raised or lowered in respect to the upper part of the same, and the distance between the claw *f* and the claw *g* may be thereby varied as the thickness of the material to be operated upon may suggest.

The elevation of the claw *f*, so as to free it from the work when the machine is in operation, is effected by means of a lever, *W*, pivoted to the frame *P* of the machine at a point, *w*, and acting upon the lower end of a link, *v*, hung at the upper end to a lug on the adjustable portion of the bar *n*, as shown in Fig. 7. The object of using the link *v* is to permit the vibration of the bar *n* when the adjustable lower portion of said bar is elevated, as shown in Fig. 15, such provision being rendered necessary by the fact that the lever *W* is pivoted to the rigid frame *P*, so that if said lever acted upon a fixed pin on the bar *n* the vibration of the said bar when its pin was under control of the lever could not be effected without depressing said lever.

In addition to the feeding-claws *f* and *g*, the machine has another pair of gripping-claws, *f'* and *g'*, which are carried, respectively, by bars *n'* and *m'*, these bars being similar in general construction to the bars *m* and *n*, and being operated, so far as vertical reciprocation is concerned, by means precisely similar to those employed in connection with said bars *m* and *n*, a scroll-cam on the inner face of the disk *B* acting on a roller on a pin, *b'*, on the bar *m'*, another pin, *i'*, on which actuates a lever, *z'*, the latter acting on a pin, *q*, on the bar *n'*. (See Fig. 7.) The gripping-claws *f'* and *g'* are intended merely for holding the work, and have no vibrating movement; hence the lifting-lever *W'* acts directly upon a pin, *v'*, in effecting the elevation of the lower portion of the bar *n'*, the use of a link in this case being unnecessary. The claw *g'* has an opening for the passage of the needle *b*.

The looper *t* is carried by a looper-arm, *T*, which is fulcrumed on the pin of a vibrating link on the lower portion of the frame *P*, and is driven by a crank on the lower end of the shaft *J*. The link carrying the fulcrum-pin of the looper-arm *T* is of such a length, and

is so pivoted in respect to the crank-pin whereby the arm is actuated, and the arm itself is so shaped, that in place of the looper traveling in a circular path and at a uniform or almost uniform speed, as usual, its path will be of irregular shape, the looper, in applying the thread to the needle, moving in close proximity thereto and at a higher rate of speed than during the remainder of its movement, so that a shorter needle than usual may be used, it being unnecessary to project the barb of the needle beneath the work-plate to such an extent as when a looper moving in the usual way is employed.

A water-reservoir, *M*, is secured by bolts *h²* to the column *K'*, near the upper end of the same, and to an opening in the top of said reservoir is adapted the wax-pot *N*, which is held in place by suitable screws or bolts, so as to make a steam-tight joint with the top of the reservoir *M*.

The cover-plate *O* has portions of its edge beveled for the action of the conical points of lateral retaining-screws *x*, as shown in Figs. 2 and 4, whereby the said cover is firmly retained in place on the wax-pot. The ball of thread is contained in a box, *B'*, on the frame *P*, as shown in Fig. 3, the thread passing through an opening, *b²*, in the lid of the box, thence through an eye, *b³*, on said lid and through suitable openings in the table *K* and in the side of the reservoir *M* into the wax-pot *N*, in which it passes through holes in the ends of a forked plate carried by an arm, *O'*, on the lid *O*, so much of the thread being thereby submerged in the melted wax that the thread will be thoroughly saturated with the wax in its passage through the same. The thread passes from the wax between a pair of jaws, *y*, in the lid *O*, these jaws being of leather, cork, felt, or similar elastic or semi-elastic material, and being adjustable by means of a screw, *y'*, the jaws serving to remove the surplus wax from the surface of the thread before the latter passes to the tension device *r²*, from which it passes beneath a roller, *r³*, to the looper *t*. The roller *r³* is carried by a pendent arm, and by its weight, or by means of a spring in addition thereto, serves to take up any slack thread which may be formed between the tension device and the looper.

The water in the reservoir *M* is heated by means of an ordinary Bunsen burner, *P*, the supply of gas for which is conveyed from any adjacent point through a flexible tube, *q'*, and a pipe provided with a cock, *y'*, whereby the supply of gas may be regulated. The burner *P* is pivoted to a stud, *P'*, on the standard *K'*, as shown in Figs. 1 and 2, so that it is capable of swinging to the extent indicated by the dotted lines in Fig. 1, whereby the heat may be applied with more or less directness to the reservoir *M*, as may be desired.

At the back of the reservoir *M* is a flue, *n²*, which serves to conduct the products of combustion from the burner *P* to the chamber *l*

above the reservoir, a deflector-plate, n^2 , serving to direct the heated products of combustion into said chamber l and through an opening in the table K, the proper degree of heat being thereby imparted to the tension device and to the sewing mechanism, in order to prevent the chilling of the hot waxed thread while the stitches are being formed.

The upper portion or head of the machine is covered by a hood, D' , which rests upon the table K, and is cut away at the lower front corner, so as to expose the needle and cast-off finger, the looper, the feeding and holding claws, and the lifting-levers—that is to say, those parts whereby the sewing operation is performed, or which have to be manipulated during the sewing operation.

On each side of the hood D' , at the front end of the same, are flues F' , which communicate with a chimney, E' , at the top of the hood, and to each side of the hood, at the lower front end of the same, is hinged a shield or flap, D^2 , these shields, when the machine is in operation, being adjusted to the position shown in Fig. 2, and serving, in connection with the flues F' , to prevent the heated air and products of combustion from being projected into the face of the operator, the heat, by means of the flues and the shields, being confined directly to the sewing mechanism, and, when it has performed its duty, being carried off to the chimney E' without being permitted to come in contact with other portions of the machine. The hood D' also serves to prevent the access of dust to the cams, shaft-bearings, gearing, and other parts of the head of the machine.

The reservoir M communicates, through two pipes, b' and d' , with a cylindrical vessel, L' , at the rear of the machine, the pipe b' serving to convey vapor from the reservoir M to said vessel L' , in which the vapor is condensed, the water of condensation returning to the reservoir through the pipe d' . The amount of heat imparted to the reservoir M should be just sufficient to cause the formation of vapor without causing the water to boil or generate steam under pressure. The vessel L' serves as a means of regulating the application of heat to the reservoir M, the attendant being able to judge from the heat of the vessel L' whether or not the water in the reservoir M is properly heated, and to adjust the burner P accordingly. It is advisable to provide the vessel L' with a pipe, h' , for the ingress or egress of air, or for the escape of vapor, in case of an excess of the latter being generated. The heat of the burner P is divided between the reservoir M and the flue n^2 , so that by the adjustment of said burner P the heat may be so distributed that neither part will receive an excess at the expense of the other, the proper balance between the parts being thus maintained and the machine readily kept in proper working condition.

A burner other than a Bunsen burner may be used to supply the heat, and the burner

may be adapted to guides in which it can reciprocate laterally instead of being vibrated, the result being the same.

The operation of the machine will be understood on reference to the diagrams, Figs. 16 to 21, inclusive, Sheet 6 of the drawings. As shown in Fig. 16, the needle has drawn a loop through the work, which is held by the gripping-claws $f'g'$, the feeding-claws fg being separated and retracted—that is to say, occupying the position farthest removed from the claws $f'g'$. The claws fg first close on the work, as shown in Fig. 17, and the claws $f'g'$ are then opened, as shown in Fig. 18, so as to free the work and permit it to be fed forward by the claws fg to the length of a stitch, as in Fig. 19, after which the claws $f'g'$ again close, as shown in Figs. 20 and 21. While these movements are being made the needle b has been descending, and when the claws fg and $f'g'$ reach the position shown in Fig. 20 the needle is about to penetrate the work, the latter being firmly held by both pairs of claws while the needle perforates the work and receives a fresh loop, as shown in Fig. 21. As the needle b descends, the cast-off finger also moves downward, but at a less rate of speed than the needle, the effect of the movement being to uncover the hook of the needle gradually, the loop of the thread being retained therein until the point of the needle reaches the work and there is no chance of the loop being drawn under the same, so as to make a mis-stitch. (See Figs. 16 to 20.) While the needle is penetrating the work the cast-off finger continues its descent, enters the loop of thread, and comes into contact with the work, as shown in Fig. 21, which position it retains until the needle, with its fresh loop, rises and the hook of the needle is covered by the cast-off finger, the latter then rising with the needle and freeing the old loop, which is drawn tight by the strain on the thread, caused by the ascent of the needle with the new loop. (See Fig. 16.) The feeding-claws fg are then separated and retracted to the position shown in said Fig. 16, prior to a repetition of the above-described operations.

The above-described machine may be run at a high rate of speed with but little power, and is almost noiseless in its operation, the principal advantages, however, in connection with the sewing of shoes, being the dispensing with a jack for holding the work and the automatic character of the feed, the claws entering the channel cut in the sole and effecting the guiding of the work without that care and attention on the part of the operator demanded in sewing shoes on the usual machines, so that with my improved machine there is no necessity for employing skilled labor, such as is ordinarily required.

I claim as my invention—

1. A feeding device for sewing-machines, in which are combined the following elements, namely: a pair of bars each having a gripping-

claw, a lever whereby said bars are connected, as described, a cam for reciprocating one of the bars, a pivot on which the bars are free to swing, and devices for vibrating the bars, all substantially as specified.

2. In a work-holder comprising a pair of bars with gripping-claws and reciprocating devices, the combination of the lower claw and its bar with an upper claw and a bar made in two parts, the upper of which is connected to the reciprocating device, while the lower part carries the gripping-claw and is adjustable in respect to the upper part of the bar, all substantially as specified.

3. In a work-holder comprising a pair of bars with gripping-claws and reciprocating devices, the combination of the lower claw and its bar, a bar made in two parts, reciprocating devices connected to the upper part of the said bar, a claw connected to the lower part of the same, a spring tending to depress the said lower part of the bar, and a lever for raising the same, as specified.

4. In a feeding device, the combination of the bar *m*, having a claw, *g*, the two-part bar *n*, having a claw, *f*, means for reciprocating and vibrating said bars, a link, *v*, hung to the claw-carrying portion of the bar *n*, and a lever, *W*, for acting on said link, all substantially as set forth.

5. The combination, in a sewing-machine, of a frame, *P*, a needle-bar, *X*, having a needle, *b*, and pin *a*, a slotted lever, *V*, connected to said pin *a*, a crank-pin, *c*, for operating said lever, means for rotating said crank-pin, and a link, *h*, whereby the lever *V* is hung to the frame *P*, as set forth.

6. The combination of the cast-off bar *Y*, a bell-crank lever, *V'*, hung thereto, a cam, *A*, acting on one arm of said lever, a spring, *X'*, acting on the other arm of the same, and means for rotating the cam *A*, whereby the lever *V'* is at liberty to yield when the bar *Y* meets with undue resistance, as specified.

7. The combination of the claw-bars *m* and *n*, having pins *i* and *p*, the cam *A*, means for rotating the same, and a lever, *z*, having a pivot-pin projecting into a slot in the bar *m*, whereby it forms a center of vibration for the latter, as set forth.

8. The combination of a pair of claw-bars, a rock-shaft, *I*, the two arms *SS'*, the loose arm *i'*, the cam *C*, means for rotating said cam, and devices whereby the arm *S'* is adjusted in respect to the arm *i'*, as specified.

9. The combination of the rock-shaft *I*, the slotted arm *S'*, the loose arm *i'*, the bolt *s'*, the set-screw *s'*, the cam *C*, and means for rotating said cam, as described.

10. The combination of a water-reservoir, *M*, a heater therefor, a wax-pot, *N*, adapted to the reservoir, a condensing-vessel, *L'*, a pipe, *b'*, for conveying vapors from the reservoir *M* to the vessel *L'*, and a pipe, *d'*, for conveying water of condensation from the vessel *L'* to the reservoir *M*, as set forth.

11. The combination of the sewing and thread-controlling mechanism, the wax-bath heater, the burner, and a flue, *n'*, whereby the heated air and products of combustion are conveyed from said burner to the sewing and thread-controlling mechanism, as specified.

12. The combination of the sewing and thread-controlling mechanism, the wax-bath heater, the laterally-adjustable burner *P*, and a flue, *n'*, whereby the heated air and products of combustion are conveyed from said burner to the sewing and thread-controlling mechanism, as set forth.

13. The combination of the sewing and thread-controlling mechanism, the wax-bath heater, the burner, the flue *n'*, and the deflecting-plate *n'*, as set forth.

14. The combination of the upper portion or head of the machine with a hood, *D'*, inclosing said head, but having its lower front corner cut away, whereby the sewing mechanism is exposed and rendered accessible, as described.

15. The combination of the sewing and thread-controlling mechanism, the wax-bath heater, the burner of the same, the heat-conveying flue *n'*, and a hood, *D'*, having flues *F'*, as specified.

16. The combination of the sewing and thread-controlling mechanism, the wax-bath heater, the burner, the heat-conveying flue *n'*, and a hood, *D'*, cut away at the lower front corner, and having hinged shields or flaps *D'*, as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CYPRIEN CHABOT.

Witnesses:

JAMES F. TOBIN,
HARRY SMITH.