

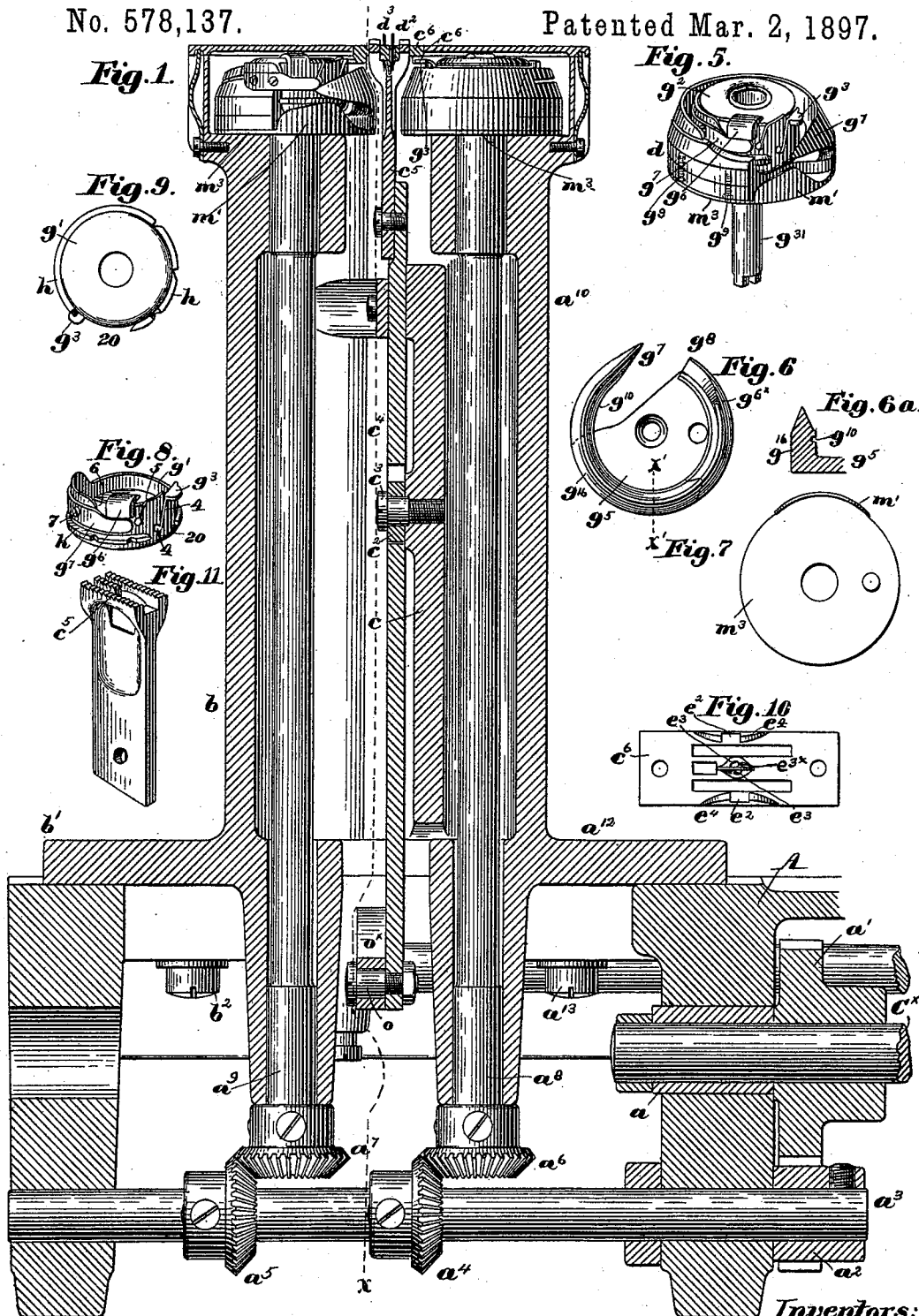
(No Model.)

3 Sheets—Sheet 1

W. F. DIAL & G. H. DIMOND.
SEWING MACHINE.

No. 578,137.

Patented Mar. 2, 1897.



Witnesses:
Halter E. Lombard.
Thomas J. Drummond.

Inventors:
Wilbur F. Dial,
George H. Dimond,
by Crosby Gregory, Attys.

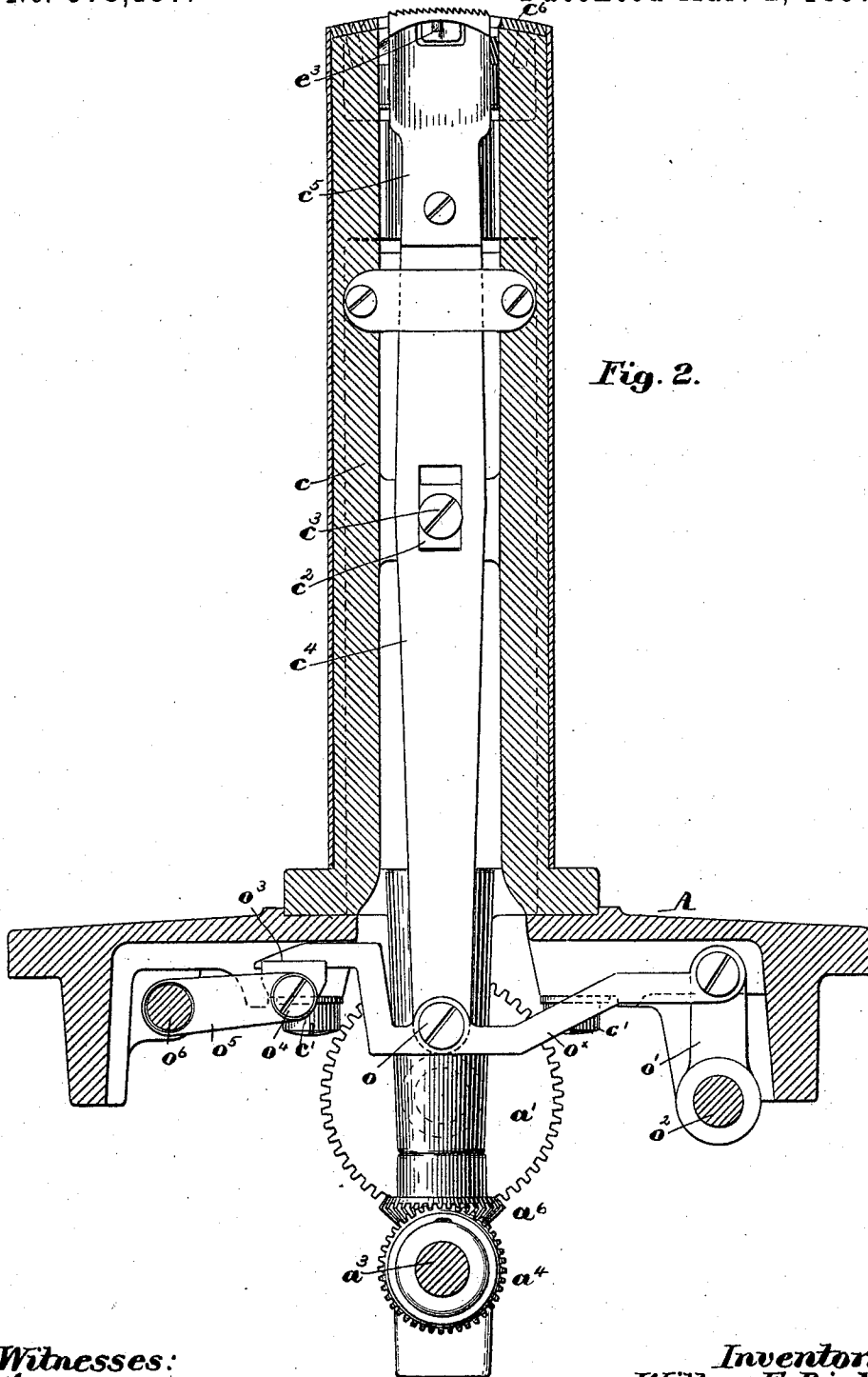
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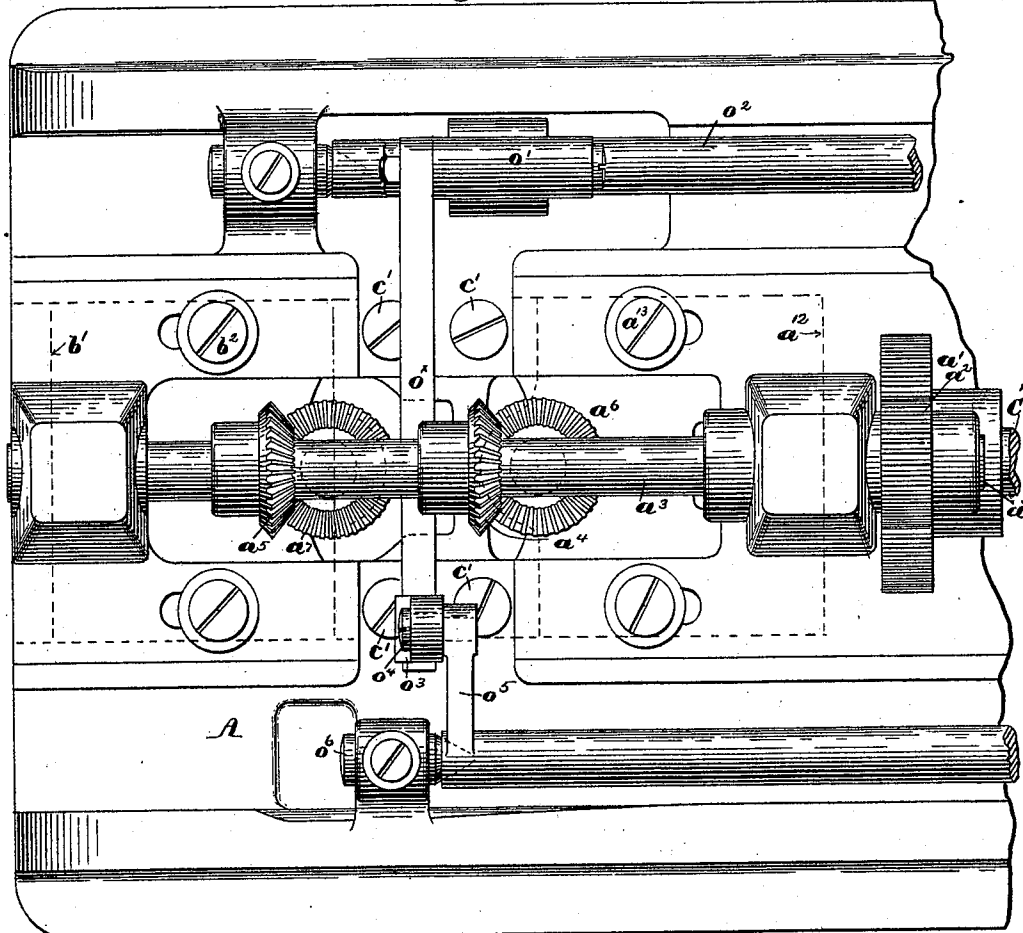
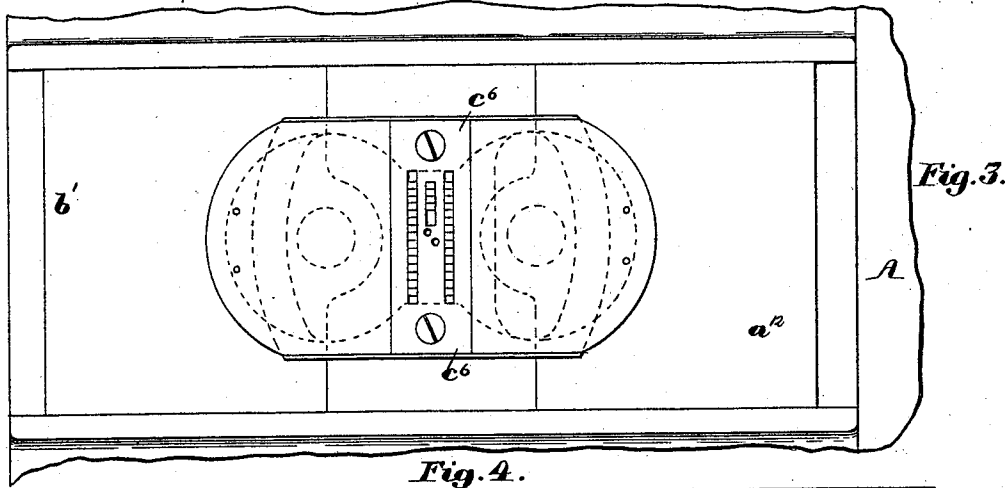
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UNITED STATES PATENT OFFICE.

WILBUR F. DIAL AND GEORGE H. DIMOND, OF BRIDGEPORT, CONNECTICUT,
ASSIGNORS TO THE WHEELER & WILSON MANUFACTURING COMPANY,
OF SAME PLACE.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 578,137, dated March 2, 1897.

Application filed January 3, 1896. Serial No. 574,230. (No model.)

To all whom it may concern:

Be it known that we, WILBUR F. DIAL and GEORGE H. DIMOND, of Bridgeport, county of Fairfield, State of Connecticut, have invented an Improvement in Sewing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

10 This invention has for its object to improve that class of machines for sewing with a plurality of needles and in which the under stitch-forming mechanism is located in an upright cylinder. Our cylinder is composed of
15 three essential members, viz: a stationary central division which serves to support the chief lever or part of the feeding mechanism, said lever or part carrying the feed-dog to move the material in the sewing operation,
20 and two upright arms, each containing a hook for entering and expanding a loop of needle-thread to pass it about a bobbin or thread case containing an under thread, the two upright arms being capable of slight adjustment
25 laterally, each toward and from the stationary division, to thereby adapt the points of the hooks to take loops from the two needles, which latter may be located more or less distant one from the other, according to the distance apart of the parallel seams to be sewed,
30 the feed device remaining in one position no matter what the adjustments.

Our invention in sewing-machines for sewing with a plurality of needles consists in a
35 bed having a stationary division, a feeding mechanism, the chief lever or part of which carrying the feed-dog is mounted on said stationary division, combined with two separable independent upright arms arranged at
40 opposite sides of said stationary division, each arm carrying its own hook or loop-taker, and an actuating-shaft therefor to operate substantially as will be described.

Figure 1, in vertical section, shows the lower
45 portion of the front end of a sewing-machine having a cylinder embodying our invention, the said figure also showing parts of two needles which may be operated in any usual way. Fig. 2 is a section on the irregular dotted line x , Fig. 1. Fig. 3 is a top or plan view
50 of the cylinder and part of the bed on which

it is erected. Fig. 4 is an under side view of the parts shown in Fig. 1. Fig. 5 is a perspective view of the hook and its contained thread-case. Fig. 6 shows the hook in plan
55 view. Fig. 6^a is a section on the line x' , Fig. 6. Fig. 7 shows the needle-guard in plan view. Fig. 8 shows the thread-case removed and the bobbin taken from it. Fig. 9 is an under side view of the thread-case; Fig. 10,
60 an under side view of the needle-plate; Fig. 11, a perspective view of the feed-point.

We have not herein shown the needle-bar and its actuating mechanism nor the mechanism for rotating the main under shaft C^x ,
65 as the said parts in practice may be all substantially as shown in United States Patent No. 405,205, dated June 11, 1889. The shaft C^x has one of its ends mounted in an eccentric bearing a and is provided with a gear a' ,
70 which meshes with a pinion a^2 , fast on a short shaft a^3 , having like bevel-gears $a^4 a^5$, which are adjustably mounted on said shaft and engage bevel-pinions $a^6 a^7$ on and to rotate the
75 vertical hook-driving shafts $a^8 a^9$. The shaft a^8 is mounted in an upright arm a^{10} , having a foot a^{12} , which is adjustably attached to the framework A by means of suitable binding-screws a^{13} in slots in the bed. The upright
80 shaft a^9 has its bearings in an upright arm b , provided with a foot b' , secured adjustably to the bed A by suitable binding-screws b^2 .

Each of the shafts $a^8 a^9$ have secured to their upper ends, substantially as described in our said application, the shanks of like
85 hooks or loop-takers d , but herein we will describe specifically but one of them—viz., the loop-taker on the shaft a^8 . The hook has a shank g^{s1} , which is fastened in a hole at the upper end of shaft a^8 . The hook consists of
90 a back part g^2 , with a two-part flange g^{16} and g^{6x} , the part g^{16} having a point g^7 , and the part g^{6x} , which is made detachable from the back by screws g^9 , having a heel g^8 , the parts of the said flange having an internal groove
95 g^{10} to receive a flange h of the thread-case g' , said flange being cut away at 20 to leave a notch or opening, into which the point of the hook when entering the loop of needle-thread casts the inactive side of said loop, the said
100 side being retained in said notch or opening, while the said hook in its further rotation

opens, spreads, and casts the said loop over and about the thread-case containing the under thread, the said loop passing out of said notch as soon as the heel of the hook uncovers the said notch, the take-up, (not shown,) but which will be as in said application, at that time acting and pulling the loop up into the material.

About one-half of the vertical wall of the bobbin-case is cut away down nearly to the said flange, the part of the wall left having the projection g^3 , the three thread-slots 4 5 6, and the lip g^6 , extended inwardly to somewhat overlap the bobbin or other device carrying the under thread and keep the bobbin within the case, the said lip also serving the additional purpose of aiding the loop in passing over the edge of the bobbin and bobbin-case, the said wall having attached to it in an adjustable manner by suitable screws, as 7, a tension device g^7 , shown as a spring, the movement of the screw 7 in one or the other direction increasing or diminishing the tension on the bobbin-thread, which is delivered from the bobbin-case through the rounded lower end of the slot 4.

The bobbin-case rests in the cavity at the face of the hook, and it contains the bobbin or under thread, and this bobbin has frequently to be renewed to afford proper supply of thread, and by cutting away the wall of the bobbin-case, as stated, the operator may readily insert the finger into the thread-case and under the upper or head end of the bobbin and pick it out of the case. The removal of a portion of the wall of the bobbin-case is therefore of vital importance, for if it were not done the bobbin could neither be put in nor taken from the case.

To put a bobbin-case into the hook or to remove a case from the hook, it is necessary to take off the removable part of the flange having the heel.

At the under side of the back of the hook we apply a needle-guard (see Fig. 7) shown as a washer m^3 , having a cam-shaped flange m' , the said flange occupying such position as to meet the needle if deflected out of its true working vertical position, the said flange acting then upon the needle to put it properly in alinement to enable the point of the hook to unerringly enter the loop of needle-thread and prevent the breaking of the needle by the contact of the hook against it. Between these two upright arms containing the devices for moving the hooks or loop-takers we have erected on the bed a vertical division c , its foot being held in place by suitable screws c' c' , the said stationary division being provided with a fulcrum composed of a block c^2 and screws c^3 , on which rocks and slides the chief lever or part c^4 of the feeding mechanism, it having at its upper end a block which we will herein designate as the "feed-dog" c^5 , it having in this instance three series of roughened surfaces, which are made to alternately engage and retire from the material,

they working through slots in the needle-plate c^6 , secured to the upper end of the said stationary division.

The lower end of the lever or part c^4 , carrying the feed-dog, is jointed at o to a feed-driving bar o^x , having one end jointed to an arm o , fixed to a rock-shaft o^2 , supported in the framework, the opposite end of said driving-bar resting in a shoe o^3 , pivoted at o^4 to the outer end of an arm o^5 , attached to or forming a part of the feed-lifting rocker-shaft o^6 , the said rocker-shafts being in practice just the same as those employed in United States Patent No. 405,205, dated June 11, 1889, so the manner in which they derive their motion need not be herein further described, except that in view of the fact that the lever or part c^4 is pivoted between its ends the direction of movement of the bar o to effect the feeding of the material resting on the needle-plate is the reverse of that in the said patent, the usual cam for driving the said bar o longitudinally being turned on its shaft substantially half a rotation.

The bars o^x and c^4 and the device c^5 , hereinbefore designated as the "feed-point," constitute the feeding mechanism, as designated in the claim.

When the upright arms are adjusted to adapt the hooks or loop-takers to needles which are farther separated than in the drawings or are of different gage as to the distance between the needles, a new needle-plate and feed-point will be used, together with a proper presser-foot, and the notch for holding the lug g^3 of the thread-case will also be located properly to be engaged by the said lug.

The needle-plate e , as shown best in Fig. 10, has two like needle-holes e^3 , and the under side of the said plate at one side of each needle-hole and between said hole and the nearest hook has a notch e^2 , in which enters loosely a projection g^3 (see Figs. 1 and 8) of the bobbin-case g' , the notch and projection preventing the rotation of the bobbin-case with the hook.

The needle-plate has extended downwardly from it about each needle-hole a boss e^{3x} , (see Fig. 10,) the boss being of such length that the flange or vertical wall of the hook in the rotation of the latter acts on the under thread close to and bends the thread over the edge of said boss, and in so doing acts to draw on said thread and pull it to a measured extent from the bobbin to form slack thread for the next stitch.

If the machine has but one hook, it will of course be understood that the needle-plate need have but one needle-hole, boss, and notch.

The bobbin or under thread is herein shown as wound on a deep disk bobbin g^2 , but the particular method of holding the under thread is immaterial, as we may use balls, cops, or other usual or suitable thread masses.

The two needles d^2 d^3 are the same as in

our said application, and they will be connected to a needle-bar actuated as therein provided for.

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

10 In a sewing-machine for sewing with a plurality of needles, the following instrumentalities, viz: a bed having a stationary division, a feeding mechanism, the chief lever or part of which, carrying the feed-dog, is mounted on said stationary division, combined with two separable independent upright arms ar-

ranged at opposite sides of said stationary division, each arm carrying its own hook or 15 loop-taker and an actuating-shaft therefor, to operate, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

WILBUR F. DIAL.
GEORGE H. DIMOND.

Witnesses:

ISAAC HOLDEN,
F. W. CUTTING.