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G. H. DIMOND & A. STEWARD.

SEWING MACHINE.

No. 418,890. Patented Jan. 7, 1890.

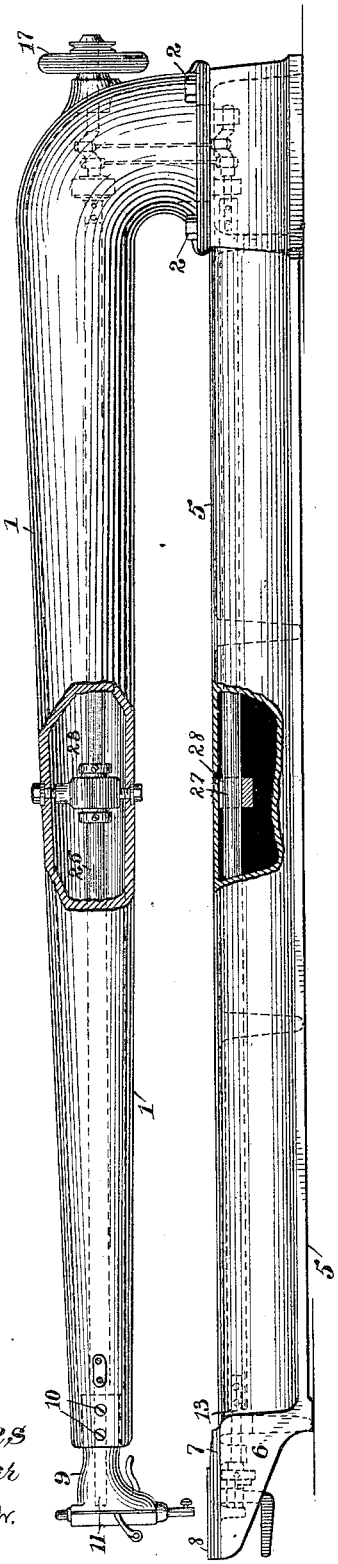

Fig. 1.

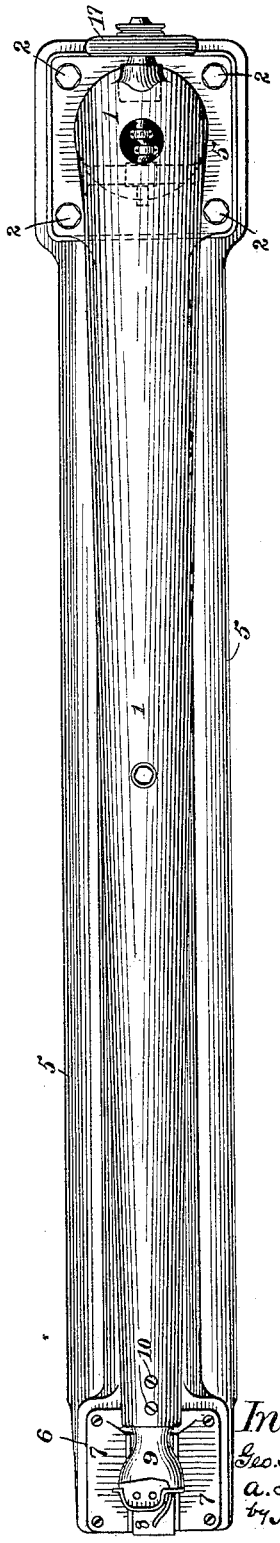

Fig. 2.

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Fig. 3.

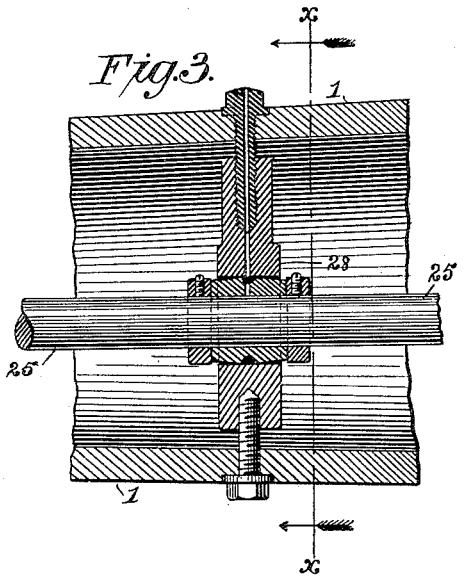
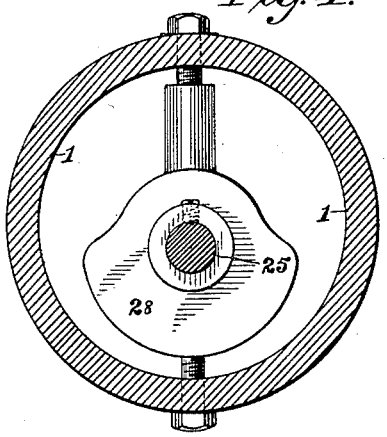


Fig. 4.



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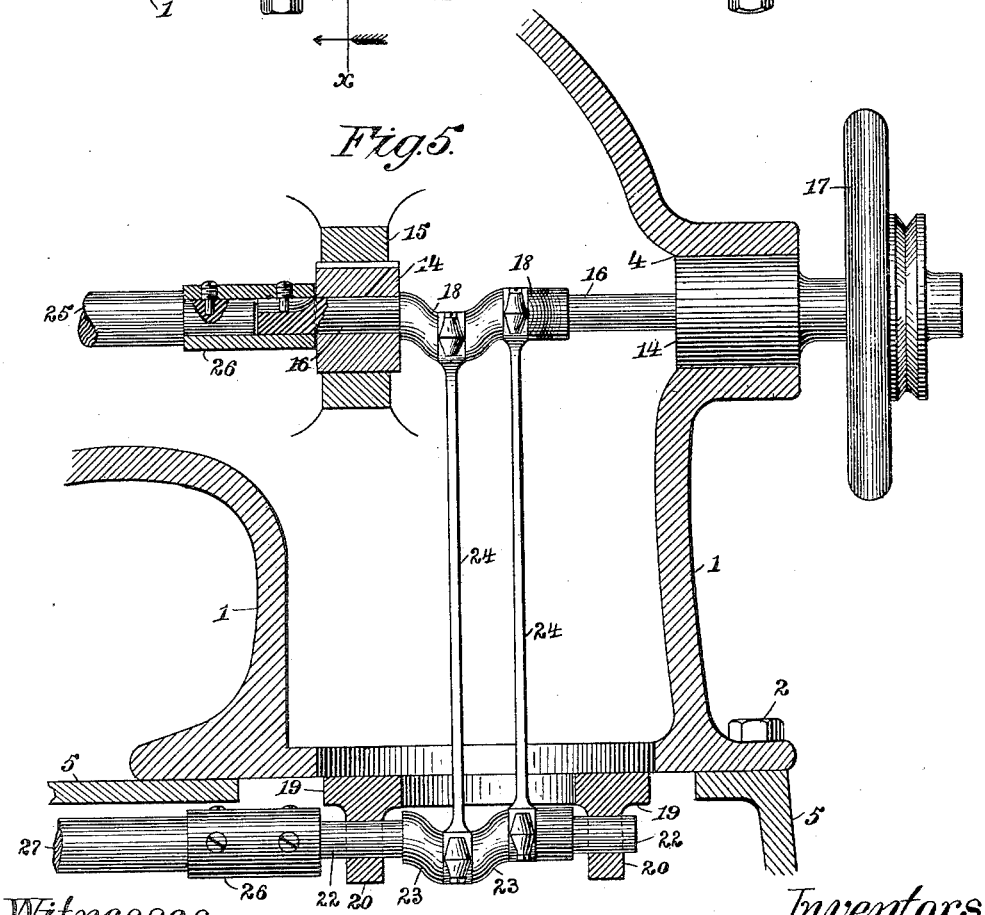

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(No Model.) 4 Sheets—Sheet 3.

G. H. DIMOND & A. STEWARD.

SEWING MACHINE.

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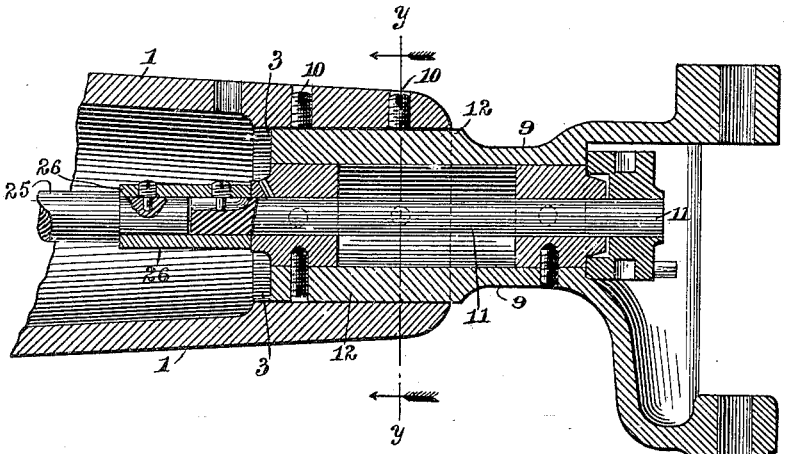


Fig. 6.

Fig. 7.

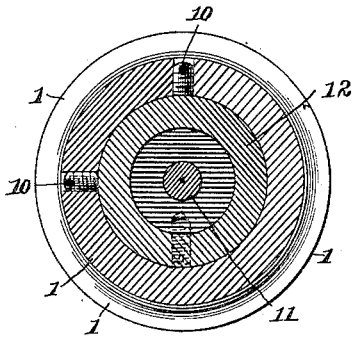
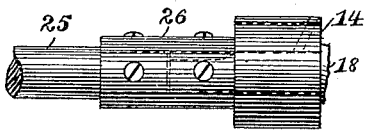


Fig. 8.



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(No Model.) 4 Sheets—Sheet 4.

G. H. DIMOND & A. STEWARD.

SEWING MACHINE.

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Fig. 9.

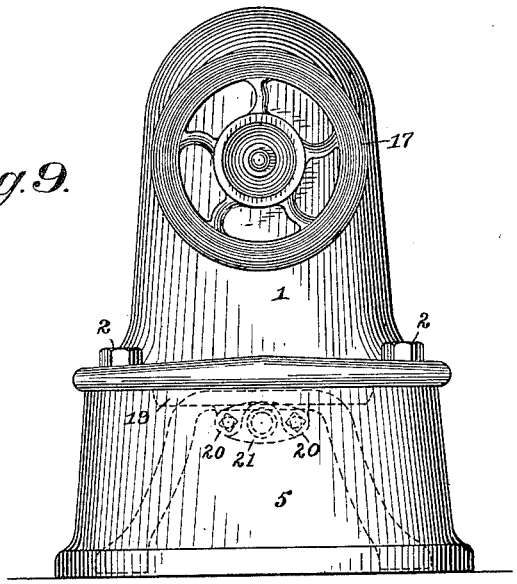

Fig. 10.

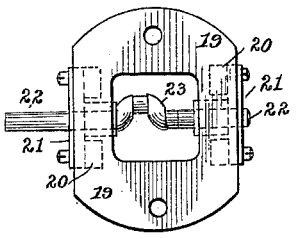

Fig. 11.

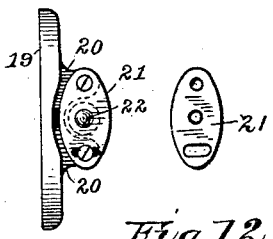

Fig. 12.

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UNITED STATES PATENT OFFICE.

GEORGE H. DIMOND AND AURELIUS STEWARD, OF BRIDGEPORT, CONNECTICUT.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 418,890, dated January 7, 1890.

Application filed June 5, 1888. Renewed October 2, 1889. Serial No. 325,736. (No model.)

To all whom it may concern:

Be it known that we, GEORGE H. DIMOND and AURELIUS STEWARD, citizens of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Sewing-Machines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to certain novel and useful improvements in sewing-machines, but particularly to that class of machines used for stitching bed-quilts and other large articles of textile fabric, which said articles require a large space beneath the arm to admit of a free passage without the necessity of folding or rolling them.

The object of our invention is to so modify and utilize certain parts of an ordinary sewing-machine that in the construction of the completed organization the manufacture of the unusually long arm and bed-plate may be accomplished without the erection and employment of powerful special machinery and appliances, such as would be needful to build such machines by the ordinary processes of manufacture.

It is further the object of our invention to render the long and expensive portions of the machine—namely, the arm and bed—entirely free from the wear incident to practical use, and by which all the moving parts are necessarily affected, and to so combine said moving parts with the said arm and bed that they may be readily removed and replaced. Thereby the usefulness of the heavy and costly members is so prolonged as to be practically unlimited.

It is well known that the mere stitching of such articles as bed-quilts is entirely within the capacity of certain machines now in use, and consequently that the stitching devices—that is, the needle and its actuating mechanism, the presser-foot and its operating devices, the take-up, and the feed and loop-taker—are subjected to no greater stress in sewing a quilt or other large article which lies flat than if the same were folded to pass under a sewing-machine arm of ordinary length. The sewing devices are amply capable of performing the stitching, provided they can be properly connected to an arm and bed of sufficient length to admit of the passage of the entire surface to be sewed between them. To the end, therefore, that this attachment may be properly effected, we construct a frame of extraordinary length—say, for quilt-sewing purposes, seven and one-half feet long—which, as to its arm and bed, may be cast in one piece, but which, for convenience of working and manipulation, we prefer to make in two parts, as shown in the accompanying drawings. In consequence of the great weight of these parts and the difficulty of imparting to them by means of ordinary tools and processes the high finish and accuracy characteristic of ordinary sewing-machines, we so construct these heavy parts that the least possible outlay of special labor will fit them for their intended purpose.

In order that such as are skilled in the art to which our invention appertains may fully understand our improvement and how to make, use, and adjust the same, we will now describe it in detail, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a side elevation of the complete machine; Fig. 2, a plan view, Fig. 3, a detail section of the central portion of the arm, showing the adjustable shaft-bearing therein; Fig. 4, a detail cross-section of the arm at the line $x\ x$ of Fig. 3; Fig. 5, an enlarged detail section of the rear end of the arm and bed, showing the shafts and their connections and bearings; Fig. 6, a detail section of the end of arm and arm-head; Fig. 7, a detail cross-section at line $y\ y$ of Fig. 6; Fig. 8, a detail of one of the shaft-couplings; Fig. 9, a rear end elevation; Fig. 10, a detail plan of the hanger; Fig. 11, an edge view of said hanger.

Similar reference-numbers denote the same parts in all figures.

1 is the overhanging arm of the machine, whose base is planed or otherwise faced so as to fit properly upon the rear end of the

bed, to which it is secured by bolts 2 or other suitable fastening devices. Said arm is cast hollow, and at 3 4 its ends are bored out, so as to receive the necessary parts hereinafter to be set forth.

5 is the bed, whose forward end is bifurcated, as seen at 6, to form a seat upon which a small bed front piece 7, carrying a cloth-plate 8, may be detachably secured.

9 is the arm-head, detachably and adjustably secured to the end of the arm by means of set-screws or other suitable fastenings 10. Said arm-head carries suitably-organized needle-bar, take-up, presser-foot devices, and their proper actuating mechanism. It has also a short shaft 11, through which power may be imparted to the operating devices just specified. At its rear end the arm-head is provided with a cylindrical portion 12, which fits snugly within the bored extremity of the arm, and is firmly held in adjusted position therein by the set-screws above noted. The arm and arm-head are thus connected, so that the latter is adjustable both axially and longitudinally relative to the former. This is highly essential in this machine, owing to the variable length of the bed consequent upon the irregular shrinkage or twisting of the iron and the difficulty of working so large masses of metal to the requisite accuracy in length; also, owing to the irregular shrinkage or twisting of the bed, the axial adjustment serves to place the needle-bar and presser-bar at an exact perpendicular to the cloth-plate. The bed front piece heretofore referred to carries an organized stitch-forming mechanism, which consists of a rotating hook, shuttle, or other suitable loop-taker, a properly-organized feed, and a short shaft 13, which serves to actuate the moving parts.

We have not shown any special construction of stitch-forming mechanism or feed, since they form no part of our present invention, and for the further reason that in the manufacture of large articles—such as quilts which are stitched in patterns or figures—an independent feed is employed to properly carry and guide the work beneath the needle. In such cases no feed is necessary as a part of the machine. For the same reason—namely, that any suitable construction may be employed without departing from the spirit and aim of our invention—we have not specifically described either the needle-bar or take-up.

In the hole at the rear end of the arm and in a partition 15, which is cast therein, we insert two removable bushings 14, to serve as bearings for each end of a short shaft 16, whose rear end carries a band-wheel 17, and which between its bearings is provided with a pair of quarter-cranks 18. Secured beneath the rear end of the arm and in the cavity of the bed by screws or other suitable fastenings is a bracket or hanger 19, and to two depending lugs 20 on said hanger we attach two cross-bars 21, which are pivoted at one end and slightly adjustable at the other, as by a slight elongation of the screw-hole in the end of the bar or other suitable simple arrangement. Each of these bars has a hole at its center to serve as a bearing for a short shaft 22, which is journaled therein and is provided with a pair of quarter-cranks 23. A pair of connecting-pitmen 24 serve to transmit between the two shafts 16 22 an isochronous rotary motion. We prefer to employ these pitmen; but any other equivalent device for the transmission of the power will answer equally as well. The two short shafts which are situated in the same plane in the arm are connected by means of an intermediate shaft 25 of the proper length, which is united to the extremities of the said short shafts by couplings 26. The two short shafts in the front and rear ends, respectively, of the bed are similarly united by a shaft 27. Each of the long shafts just referred to is preferably supported at or near its center in an adjustable steadying-journal 28, as shown at Figs. 3 and 4. This conduces to the true running of the machine, but is not absolutely essential to its successful operation. The arm-head and bed front piece, the hanger, the bushings, the adjustable bearings, and the short shafts and their connecting-pitmen are all comparatively small parts and capable of ready treatment and manipulation by the ordinary machines and methods employed in sewing-machine manufacture; hence such parts as are exposed to wear may be readily renewed. The bed and arm, which have no active function and which serve merely to support the moving parts, are thus always the same and capable of being fitted at any time with the new small parts which go to complete the organization.

We prefer to employ two parallel revolving shafts, as shown; but said shafts can be so connected that one of them operates by an axial oscillation or rocking movement, if it should be found expedient so to do.

In assembling the machine it will be observed that all the small parts are adjustable within certain limits. This enables said parts to be attached to the bed and arm and to be assembled in their proper relative position irrespective of any slight variation in size which may have resulted from the unequal shrinkage or warping of the large castings. By the adjustability of the bearings both shafts may be caused to run true. By the adjustability of the head and bed front piece the stitching devices may be readily adjusted so as to secure perfect co-operation of the moving parts.

The shaft-couplings admit of slight changes in the length of the respective shafts.

We claim—

1. In a sewing-machine, the combination, with the stitch-forming and loop-taking mechanisms, of the overhanging arm and the bed, the detachable arm-head secured upon the

end of said arm and adjustable relative thereto both longitudinally and axially, and means for securing said head, the needle-bar mounted in said head, the detachable bed front piece secured upon the extremity of the bed and carrying the loop-taking devices, and a pair of parallel and connected rotating shafts, whereby appropriate rotary motion is imparted to the stitching mechanism, substantially as set forth.

2. In a sewing-machine, the combination, with the stitch-forming and loop-taking mechanisms and means for driving the latter, of the arm, the removable and adjustable arm-head supported upon the extremity thereof, the adjustable bearing at the rear end of the arm, the steadying-journal at or near the center of the arm, and the main shaft hung in said bearings and adjustably connected to the moving parts within the head, substantially as specified.

3. In a machine of the character described, the combination, with the stitch-forming and loop-taking devices, of the rigid arm and the arm-head removably and adjustably secured upon the same, a short shaft connected to and adapted to drive the moving parts, the adjustable bearing arranged within the arm, and the main shaft hung in said bearings and adjustably connected to the short shaft hereinbefore referred to, substantially as described.

4. The combination, with the stitch-forming elements of a sewing-machine, of the rigid arm, the arm-head longitudinally and axially adjustable thereon, the main shaft hung within the arm, the adjustable bearings at the rear end of said main shaft, the short shaft whereby power is applied to the moving parts within the head, the adjustable connection between said short shaft and the main shaft, and the steadying-journal at the center of the shaft and adjustable relative thereto, substantially as set forth.

5. The combination, with the arm, the needle-bar and take-up, and means for driving the same and the loop-taking devices, of the bed, the bed front piece detachably secured upon the extremity thereof and containing said loop-taking devices, the rotating shaft beneath the bed, whereby the loop-taker is actuated, a short driven shaft adjustably supported at the rear end of the bed, and a connection, as shaft 27, between said short shaft and the loop-taker shaft, substantially as specified.

6. In combination, the main shaft and the arm-head mechanism driven thereby, the short cranked shaft at the rear of the arm hung in detachable bearings and detachably connected to the main shaft, the lower cranked shaft and the adjustable bearings in which the latter is journaled, the pitman-connections between said shaft and the upper shaft, and the shaft 27 and the mechanism thereby driven, substantially as set forth.

7. The combination, with the stitch-forming and loop-taking mechanism, of the shaft 27 and its adjustable connection to the lower cranked shaft, the hanger secured in the cavity of the bed, the two cross-bars pivoted at one end and adjustable at the other, and the bearings formed in the cross-bars and adapted to support said lower cranked shaft at each end thereof, substantially as specified.

8. The combination, with the needle-bar and the means for driving the same, of the loop-taking device, a short shaft for the driving of the same, a detachable bed front piece secured on the end of the bed and wherein the said loop-taker is arranged, a shaft, as 27, connected to the short hook driving-shaft, and a short driven shaft at the rear of the bed connected to the shaft 27, substantially as specified.

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

GEORGE H. DIMOND.
AURELIUS STEWARD.

Witnesses:
A. R. LACEY,
C. N. WORTHEN.