Aug. 3, 1943. F. F. ZEIER 2,325,928

SEWING MACHINE FRAME

Original Filed April 15, 1939 6 Sheets-Sheet 1

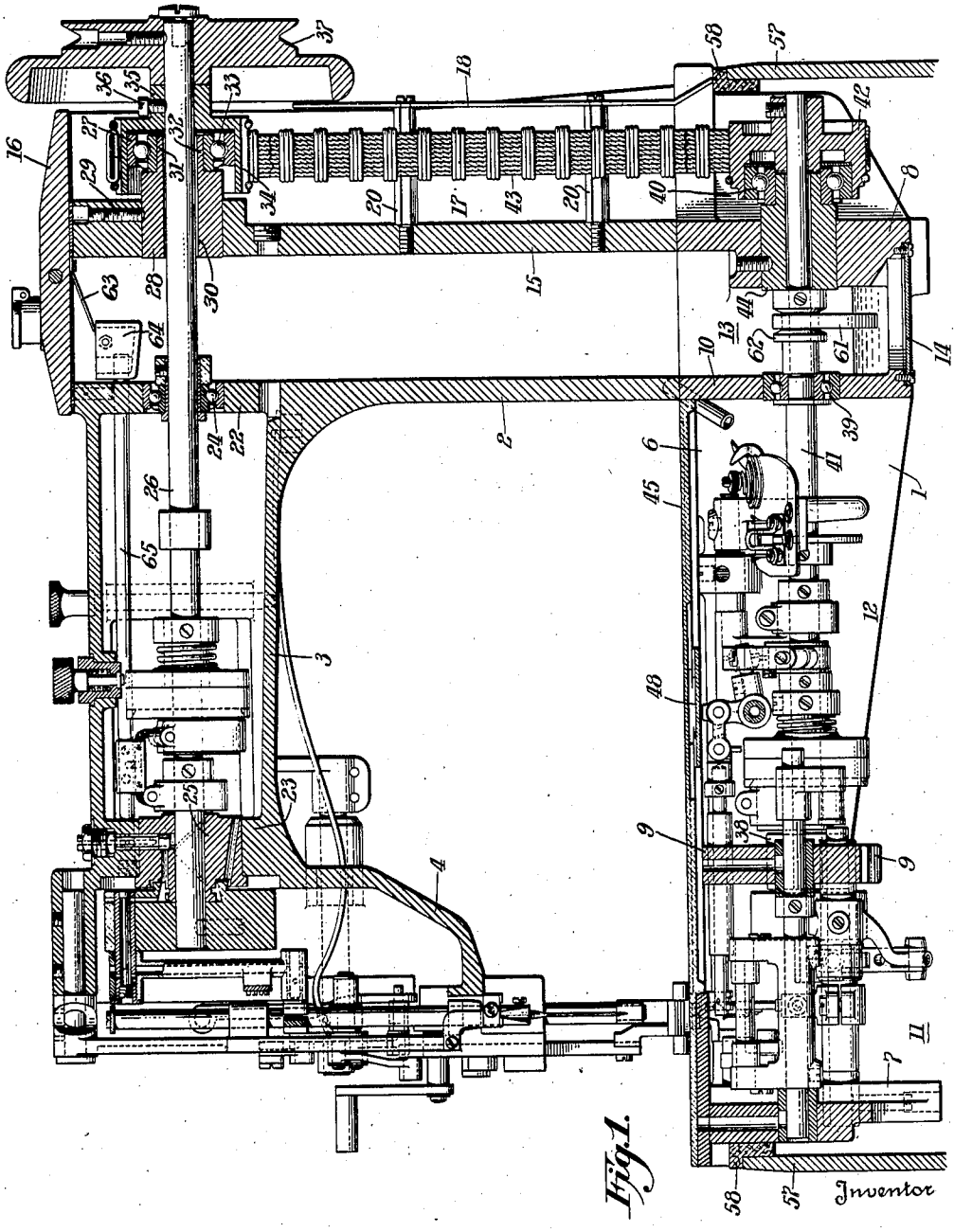


Fig. 1.

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SEWING MACHINE FRAME

Original Filed April 15, 1939 6 Sheets-Sheet 2

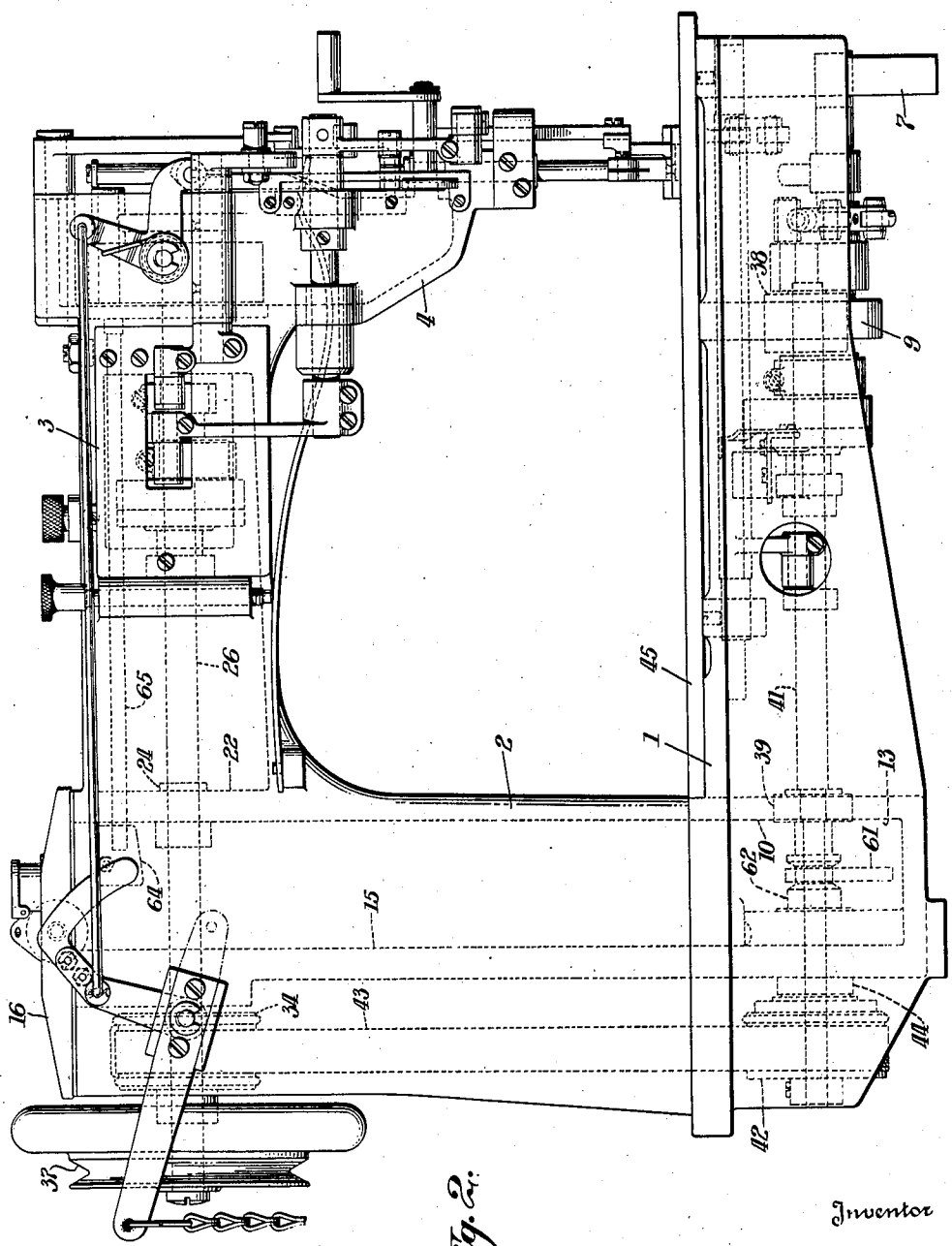


Fig. 2.

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SEWING MACHINE FRAME

Original Filed April 15, 1939 6 Sheets-Sheet 3

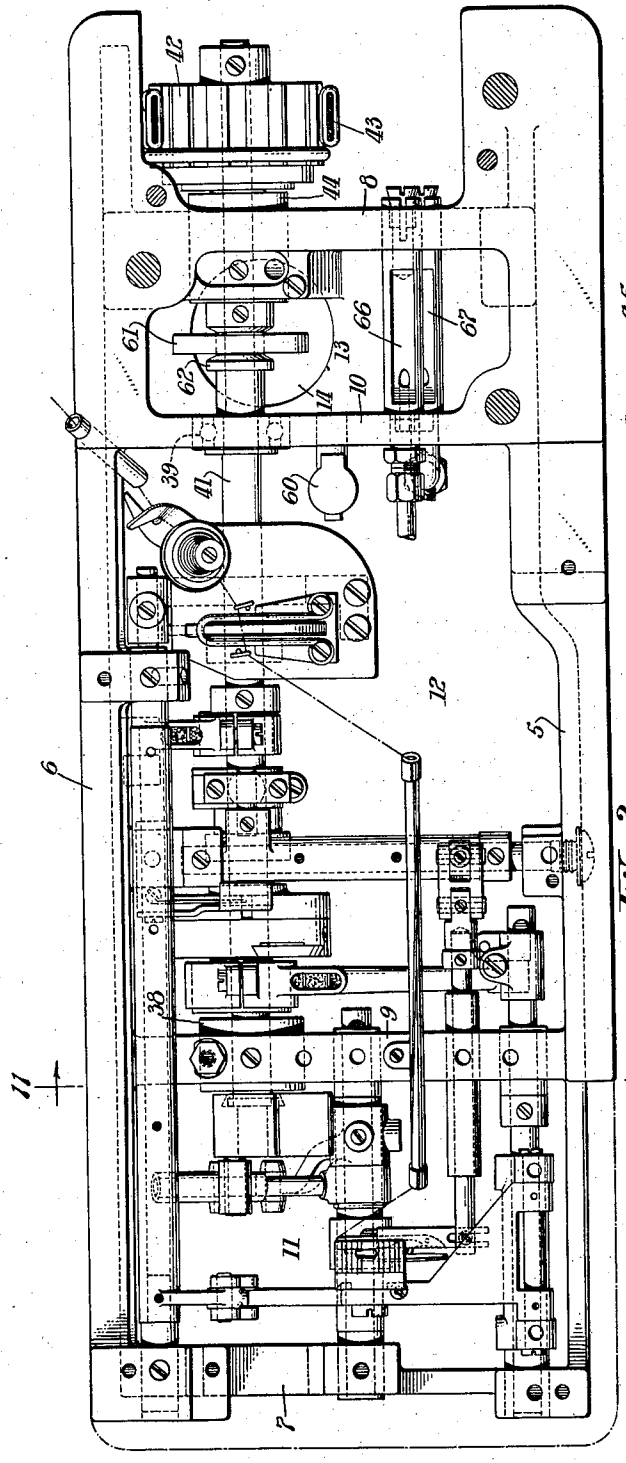


Fig. 3.

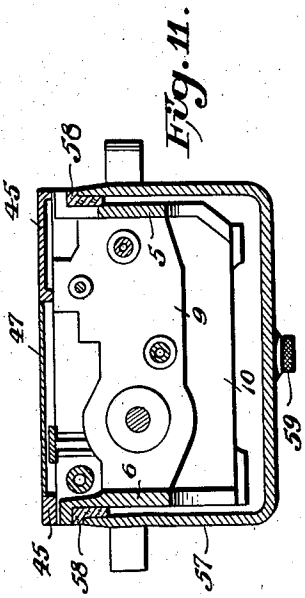


Fig. 11.

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SEWING MACHINE FRAME

Original Filed April 15, 1939 6 Sheets-Sheet 4

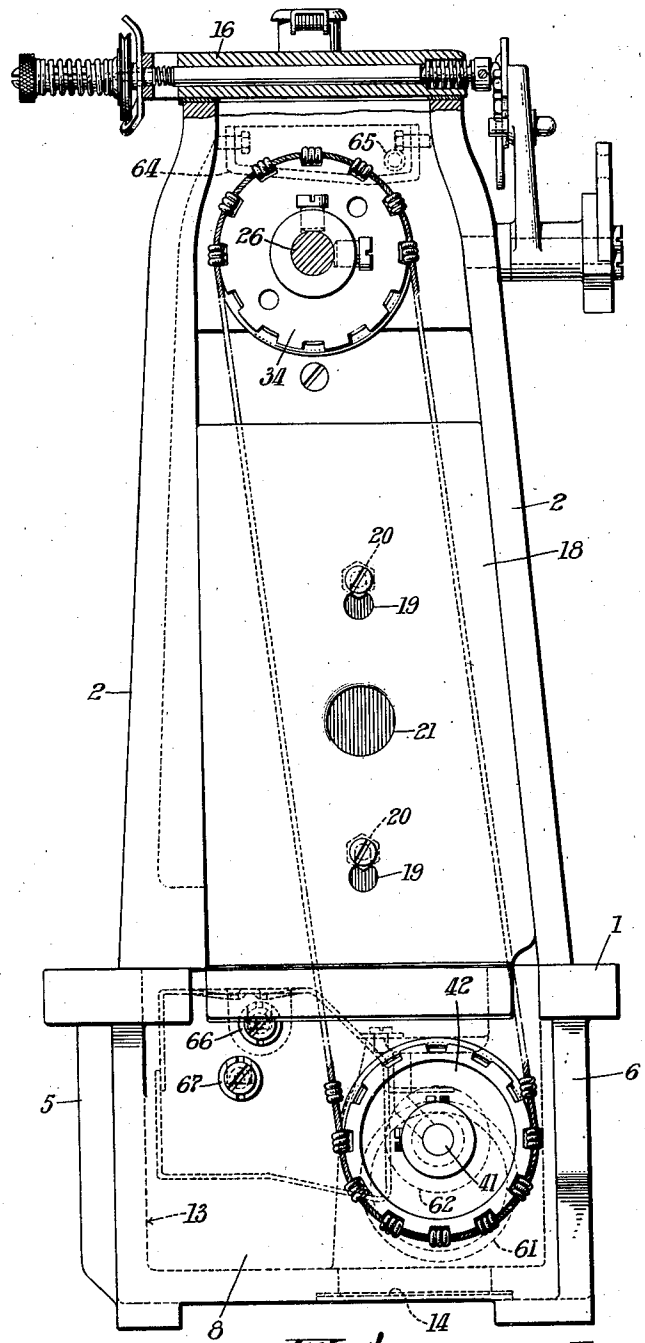


Fig. 4.

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SEWING MACHINE FRAME

Original Filed April 15, 1939 6 Sheets-Sheet 5

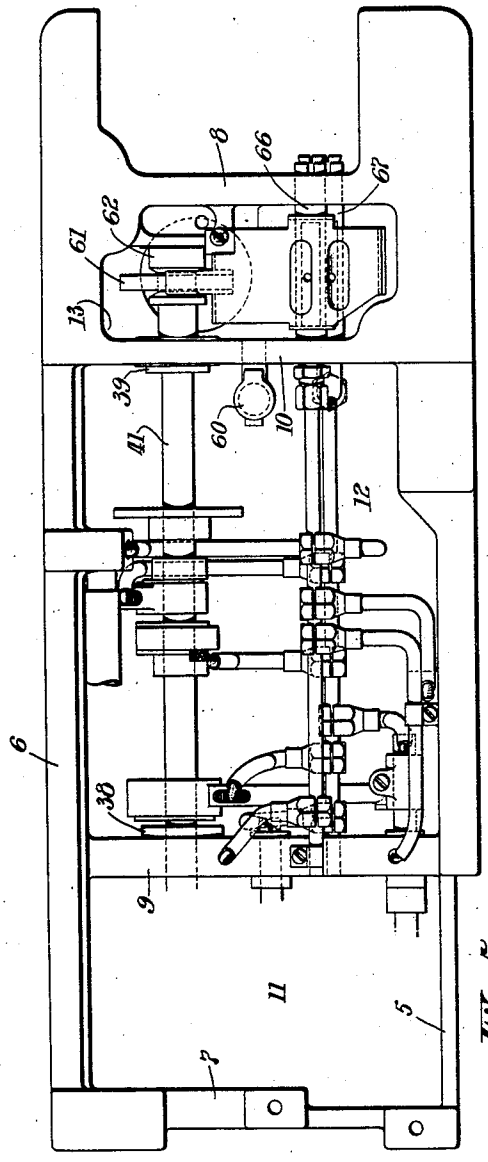


Fig. 5.

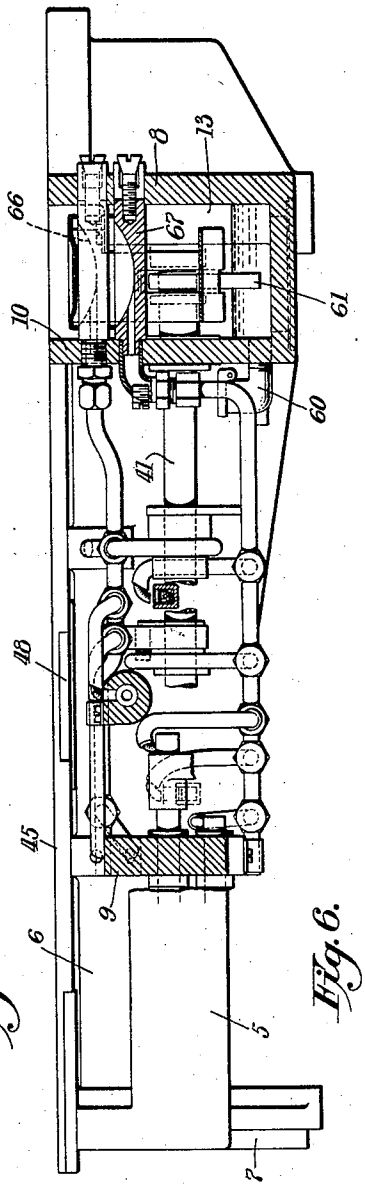


Fig. 6.

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SEWING MACHINE FRAME

Original Filed April 15, 1939 6 Sheets-Sheet 6

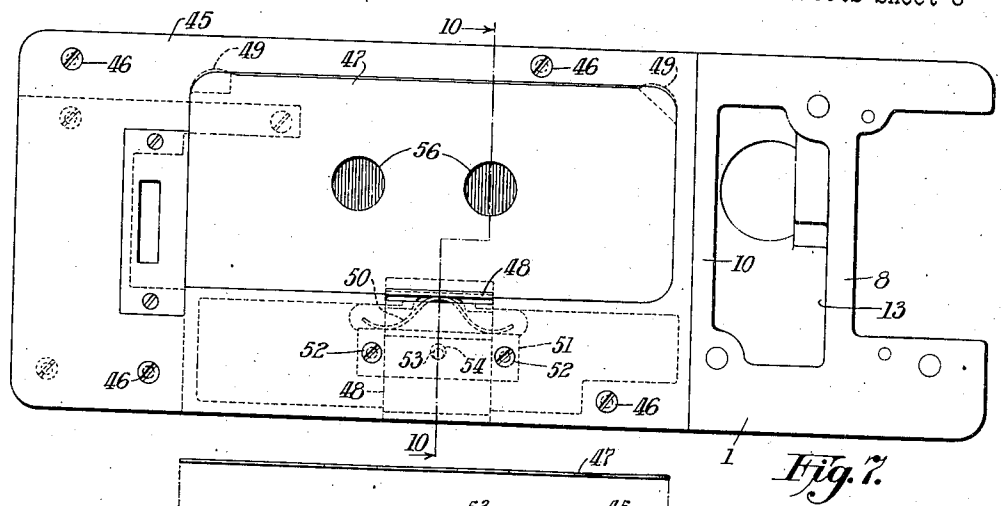


Fig. 7.

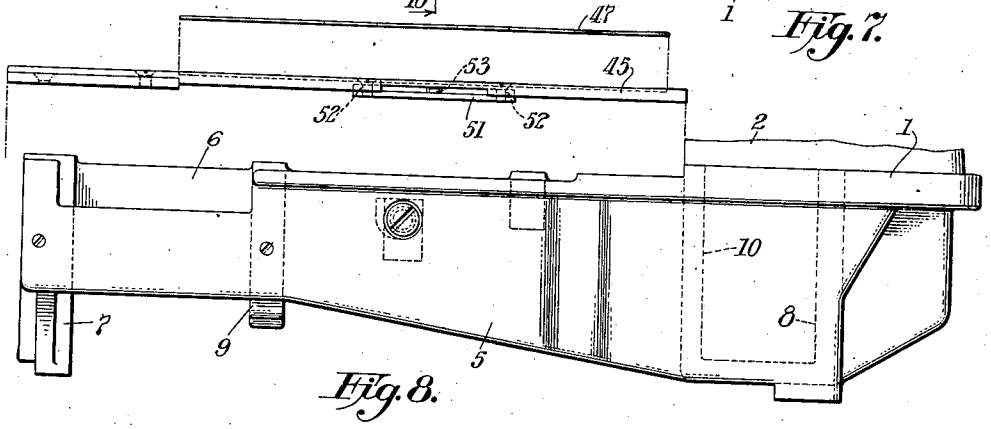


Fig. 8.

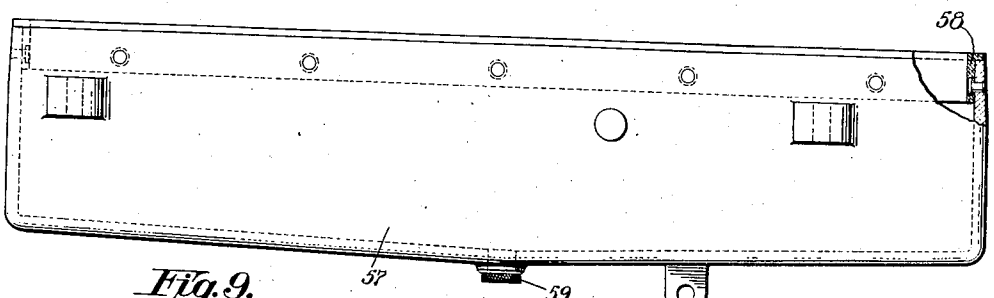


Fig. 9.

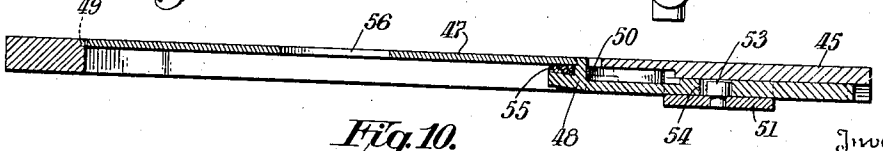


Fig. 10.

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UNITED STATES PATENT OFFICE

2,325,928

SEWING MACHINE FRAME

Frederick F. Zeier, Fairfield, Conn., assignor to The Singer Manufacturing Company, Elizabeth, N. J., a corporation of New Jersey

Original application April 15, 1939, Serial No. 267,958. Divided and this application October 26, 1940, Serial No. 362,907

7 Claims. (Cl. 112—258)

This invention relates to sewing machines and more particularly to an improved frame structure therefor.

The primary object of the present invention is the provision of a machine-frame skeletonized so that all the mechanisms housed thereby are conveniently accessible for assembly and repair by simply removing various plates and the like.

Another object of the present invention is the provision of a machine-frame having an improved bed construction fitted with a removable work-supporting plate and adapted to be received in a box-like drip-pan, whereby oil-drippings and lint may filter through the mechanisms in the bed and be collected in the drip-pan, while the work-supporting plate may be removed to facilitate assembly, adjustment and repair of the mechanisms within the bed.

With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, combinations, and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

Referring to the drawings,

Fig. 1 is a longitudinal vertical section through the frame of a machine embodying the invention, showing the internal mechanism.

Fig. 2 is a rear side elevation of the sewing machine with the oil drip-pan removed.

Fig. 3 is a top plan of the machine-bed with the bracket-arm and work-supporting plate removed therefrom to expose the mechanism within the bed.

Fig. 4 is a rear end elevation of the machine with the balance-wheel removed.

Fig. 5 is a top plan of the machine-bed with the work-supporting plate and a major portion of the mechanism removed to expose the lubricant-distribution system employed to oil the various bearing points.

Fig. 6 is a front side elevation of the machine-bed, partly in section.

Fig. 7 is a top plan of the work-supporting plate secured upon the machine-bed.

Fig. 8 is a front side elevation of the machine-bed and work-supporting plate.

Fig. 9 is a front side elevation of the drip-pan which is adapted to enclose the machine-bed.

Fig. 10 is an enlarged vertical section taken substantially along the line 10—10, Fig. 7.

Fig. 11 is a transverse vertical sectional view, on reduced scale, of the machine-bed and drip-pan taken substantially along the line 11—11, Fig. 3.

The following detailed description has to do with the construction of the machine-frame only, and for a more complete description of the entire machine reference may be had to my U. S. Patent No. 2,266,140, dated December 16, 1941, of which this application is a division.

Referring more in detail to the drawings, the hollow machine-frame, which is preferably cast in two pieces, bed and arm, comprises a rectangular bed 1 from one end of which rises a standard 2 of an overhanging bracket-arm 3 terminating in a head 4.

The rectangular bed 1 is composed of vertically disposed front and rear side walls 5 and 6, and end walls 7 and 8. Intermediate the end walls 7 and 8 are two dividing walls 9 and 10 which separate the bed 1 into three rectangular compartments 11, 12 and 13. Disposed in compartments 11 and 12 are the stitch-forming mechanism and the feeding mechanism, together with conenctions for actuating the same. Each of these two compartments is open at the bottom to permit the precipitation of spent oil, lint and dirt from the mechanism within these compartments. By reference to Fig. 1, it will be seen that compartment 13 forms the lower portion or sump of a lubricant chamber and is closed at the bottom by means of a removable circular sheet-metal cover-plate 14.

Secured upon the rear end-portion of the bed 1 is the standard 2 of the bracket-arm 3. The standard has integrally formed therewith a vertical internal partition 15 which extends from the rear end wall 8 of the bed 1 to a cover-plate 16 secured upon the top of the bracket-arm 3, and divides the space within the standard into the oil or splash-lubrication chamber 13 and a belt compartment 17. The open face of the standard is closed by means of a sheet-metal plate 18 which is adapted to protect the operator from contacting the driving belt housed within the belt compartment 17. In order to facilitate removal of the plate 18, it is provided with two keyhole-slots 19 entered by the spacing studs 20 threaded into the partition 15, and with a finger-hole 21, whereby the plate 18 may be easily grasped.

The bracket-arm 3 at the standard end is provided with an internal partition 22 and at its head end is provided with an internal partition 23, which partitions define a compartment housing the eccentrics and some of the connections

for actuating the needle and top feeding mechanisms. In addition, partitions 22 and 23 provide bearing lugs for the ball-bearing 24 and the bearing bushing 25 in which is journaled the main or arm-shaft 26. To lend support to the end-portion of the arm-shaft 26 adjacent the standard 2, there is provided an additional ball-bearing 27, and supporting means therefor which is mounted in the vertical internal partition 15 of the standard 2. The supporting means for the ball-bearing 27 comprises a bushing 28 fixed in the partition 15 by the set-screw 29 and having an axial bore 30, the diameter of which is slightly in excess of the diameter of the arm-shaft 26. The bushing 28 is formed at one end with a reduced end-portion 31 upon which is press-fitted the inner race 32 of a commercial ball-bearing 33. Press-fitted upon the periphery of the outer race of the ball-bearing 33 is the flange of a belt-sprocket 34 of which the hub 35 is secured by set-screw 36 upon the arm-shaft 26. Fixed upon the end of the arm-shaft 26 is the usual belt-driven balance-wheel 37. With the ball-bearing supporting means above described, it will be obvious that the bushing 28, ball-bearing 33 and belt-sprocket 34 may be assembled as a unit and conveniently applied to the machine by merely tightening the set-screw 29 and 36. Further, from Fig. 1 it will be observed that the flange of the belt-sprocket 34 is extended laterally so that it encloses the ball-bearing 33 and, in effect, provides a housing therefor.

Longitudinally of the bed 1 there is journaled in the bushing 38, ball-bearing 39 and ball-bearing 40, the lower rotary main-shaft 41 having secured upon one end thereof a belt-sprocket 42 of the same diameter as the belt-sprocket 34. These two belt-sprockets 34 and 42 are connected by means of a conventional clip-belt 43 to rotate at a ratio of one-to-one. It will be seen from Fig. 1 that the belt-sprocket 42, as in the case of belt-sprocket 34, in effect acts as a support for the end of the lower main-shaft 41 through the medium of the ball-bearing and the stationary bushing 44 secured in the wall 8 of the bed 1. The main-shaft 41 at its forward end-portion has secured thereto eccentrics and a crank for actuating the mechanism located within the bed 1.

Referring now to Figs. 7 to 10, inclusive, it will be observed that the bed 1 is provided with a work-supporting plate 45 detachably secured by means of four screws 46. In order that access may be had to the mechanism beneath the work-supporting plate 45, and to facilitate threading the looper, the work-supporting plate 45 is fitted with a removable cover-plate 47 held in position by the latch 48, the upper surface of the cover-plate being at the same level as the upper surface of the work-supporting plate. This latch 48 yieldingly maintains the two corners 49 of the cover-plate 47 seated in undercut recesses formed in the work-supporting plate 45. The latch 48 is maintained in engagement with the cover-plate 47 by a bowed spring 50 the ends of which bear against a retaining strap 51 fastened beneath the work-supporting plate 45 by the screws 52. Endwise movement of the latch 48 is controlled by the stop-pin 53 of which the head enters an enlarged aperture 54 in the latch 48. Chatter of the cover-plate 47 is minimized in the present case by using only three point contact between the cover-plate 47 and the work-supporting plate 45, aided by the use of a strip of rubber or felt 55 on the latch 48. To facilitate removal of the cover-plate 47, the latter is formed with two finger-holes 56. In removing the cover-plate 47, the operator inserts a finger in each of the holes 56 and shifts the plate 47 to the right, Fig. 10, thereby disengaging the two corners 49 of the cover-plate from their respective recesses and permitting the same to be tilted and removed.

The machine bed 1 is adapted to be placed in an open-topped box-like drip-pan 57 (see Fig. 8) having secured around its upper edge an L-shaped gasket 58 which prevents metal-to-metal contact between the machine-bed 1 and the drip-pan 57. It will be understood that the surplus oil supplied to the various bearings through piping later to be described, is collected in the drip-pan which periodically is drained through the plug 59 and cleaned out. The gasket 58 not only prevents the egress of oil from the drip-pan 57, but also functions as a vibration dampening expedient.

Referring to Fig. 1, the standard 2 is divided by the internal partition 15 into a splash-lubrication compartment 13 and a belt-compartment 17, the splash-lubrication compartment 13 being closed at the bottom by means of a removable circular cover-plate 14. Oil is introduced into the compartment 13 through an oil-cup 60 threaded into the wall 18 of the bed. Contacting the oil contained in the compartment 13 is an oil-sling in the form of a ring 61 running on a grooved driving collar 62 secured upon the lower main-shaft 41. This oil-sling during the operation of the machine creates an oil-mist throughout the entire compartment 13 of the machine and the oil suspended in this atmosphere is deposited upon an inclined collector plate 63 at the top of the compartment 13. The oil upon the collector plate 63 runs off the same into an open-topped reservoir 64 at the upper end of the compartment 13. The oil collected in the reservoir 64 is distributed to the needle-bar mechanism and other bearing points within the bracket-arm requiring lubrication through the lubricant-conduit 65.

Adjacent the lower end of the lubrication-compartment, the oil suspended in the atmosphere is collected in two tubular reservoirs 66 and 67 which are connected through suitable piping (see Figs. 5 and 6) to all the points requiring oiling.

From the above description, it will be understood that a machine-frame is provided in which all the mechanism housed thereby is conveniently accessible for assembly and repair, by virtue of the fact that the machine-frame is skeletonized and is fitted with removable cover-plates and a removable box-like drip-pan. This construction of the machine-frame is particularly advantageous in assembling and adjusting the machine, since it exposes the majority of the mechanisms within the machine-frame.

Having thus set forth the nature of the invention, what I claim herein is:

1. A sewing machine frame comprising a bed having side and end walls and a plurality of transversely arranged dividing partitions defining a mechanism compartment and an oil-sump; a standard rising from one end of said bed and having an internal partition in alinement with one wall of said oil-sump dividing said standard into a belt compartment and a splash-lubrication compartment; a bracket-arm terminating in a head overhanging said bed; a drip-pan having upstanding side and end walls adapted to receive said bed; and a detachable work-supporting plate

secured upon the top of said bed for covering the operating connections contained within the mechanism compartment of said bed.

2. A sewing machine having a hollow frame including a bed having side and end walls and a bottom wall at one end only; a standard and a bracket-arm; said bed having a plurality of transverse partitions dividing said bed into at least one mechanism compartment and an oil-sump; a vertical partition in said standard in alinement with one wall of said oil-sump and extending to the top of the bracket-arm dividing said standard into a splash-lubrication compartment and a belt compartment; an open-topped box-like drip-pan adapted to receive said bed and providing a bottom wall for said mechanism compartment in said bed; and a removable work-support mounted upon said bed and providing a top for said mechanism compartment in said bed.

3. A sewing machine having a hollow frame including a bed having side and end walls and a bottom wall at one end only, a standard and a bracket-arm terminating in a head, said bed having at least one transverse partition dividing said bed into a mechanism compartment and an oil-sump; a vertical partition in said standard in alinement with one wall of said oil-sump and extending to the top of the bracket-arm dividing said standard into a splash-lubrication compartment and a belt compartment; a plurality of internal partitions in said bracket-arm defining between the head thereof and the splash-lubrication compartment a mechanism compartment; an open-topped box-like drip-pan adapted to receive said bed and provide a bottom wall for said mechanism compartment in said bed; a gasket interposed between the top of said drip-pan and the side and end walls of said bed to prevent metal-to-metal contact between the drip-pan and bed; and a removable work-support mounted upon said bed and providing a top for said mechanism compartment in said bed.

4. A sewing machine frame comprising a bed having side and end walls and a plurality of transversely arranged dividing partitions defining a mechanism compartment and an oil-sump; a standard rising from one end of said bed; a bracket-arm terminating in a head overhanging said bed; a drip-pan having upstanding side and end walls adapted to enclose the side and end walls of said bed; a work-supporting plate secured upon the top of said bed and having formed therein an opening through which access may be had to the mechanism compartment in said bed; a removable cover-plate for closing said opening having its upper surface substantially at the same level as the upper surface of the work-supporting plate; and resilient means for locking said cover-plate in position upon said work-supporting plate.

5. A sewing machine frame comprising a bed having side and end walls and a plurality of transversely arranged dividing partitions defining a mechanism compartment and an oil-sump; a standard rising from one end of said bed; a bracket-arm terminating in a head overhanging said bed; a drip-pan having upstanding side and end walls adapted to enclose the side and end walls of said bed; a work-supporting plate secured upon the top of said bed and having formed therein an opening through which access may be had to the mechanism compartment in said bed; a removable cover-plate for closing said opening having its upper surface substantially at the same level as the upper surface of the work-supporting plate; and resilient means for locking said cover-plate in position upon said work-supporting plate, said resilient means comprising a latch supported by said work-supporting plate and biased into engagement with said cover-plate by a spring acting between the latch and the work-supporting plate.

6. A sewing machine frame as set forth in claim 4, in which the resilient means for locking said cover-plate in position upon said work-supporting plate comprises a latch slidably attached to the work-supporting plate by a retaining strap, and a bowed spring acting between the latch and the retaining strap for yieldingly biasing said latch into engagement with said work-supporting plate.

7. A sewing machine frame comprising a bed having side and end walls and a plurality of transversely arranged dividing partitions substantially the same height as said side and end walls and defining at least one small mechanism compartment and an oil-sump, the latter of which is closed at its bottom; a standard terminating into a bracket-arm secured on said bed; a vertical partition in said standard in alinement with one wall of said oil-sump and extending to the top of the bracket-arm dividing said standard into a splash-lubrication compartment and a belt-compartment; a cloth-plate secured on said bed to provide a flat work-supporting surface; and a high-walled open-topped box-like drip-pan adapted to receive said bed and contact the same adjacent the level of said cloth-plate, said drip-pan providing a bottom wall for said mechanism compartment in said bed.

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