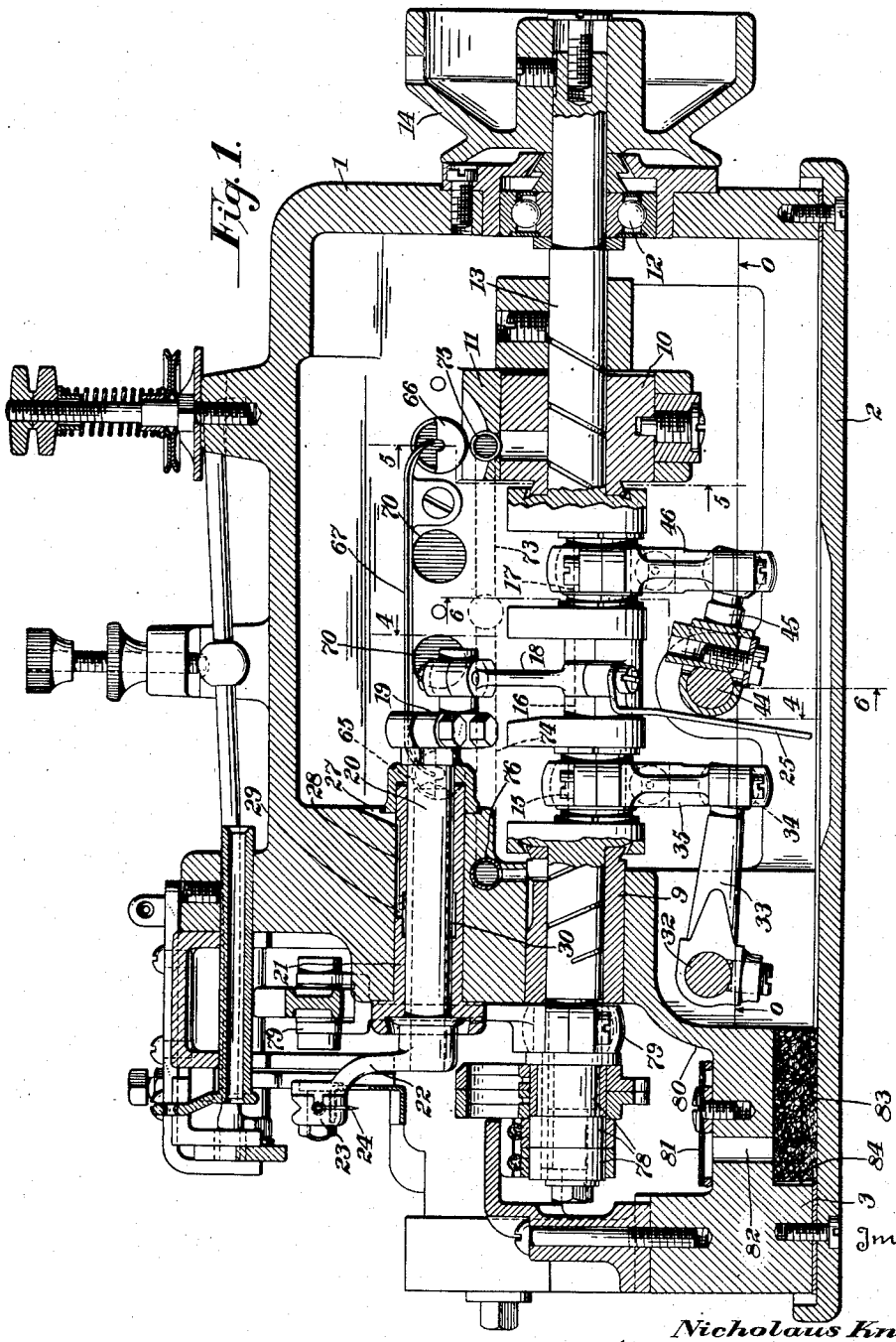
April 15, 1941. N. KNAUS 2,238,797

LUBRICATING SYSTEM FOR SEWING MACHINES

Original Filed June 10, 1939 5 Sheets-Sheet 1

Fig. 1.



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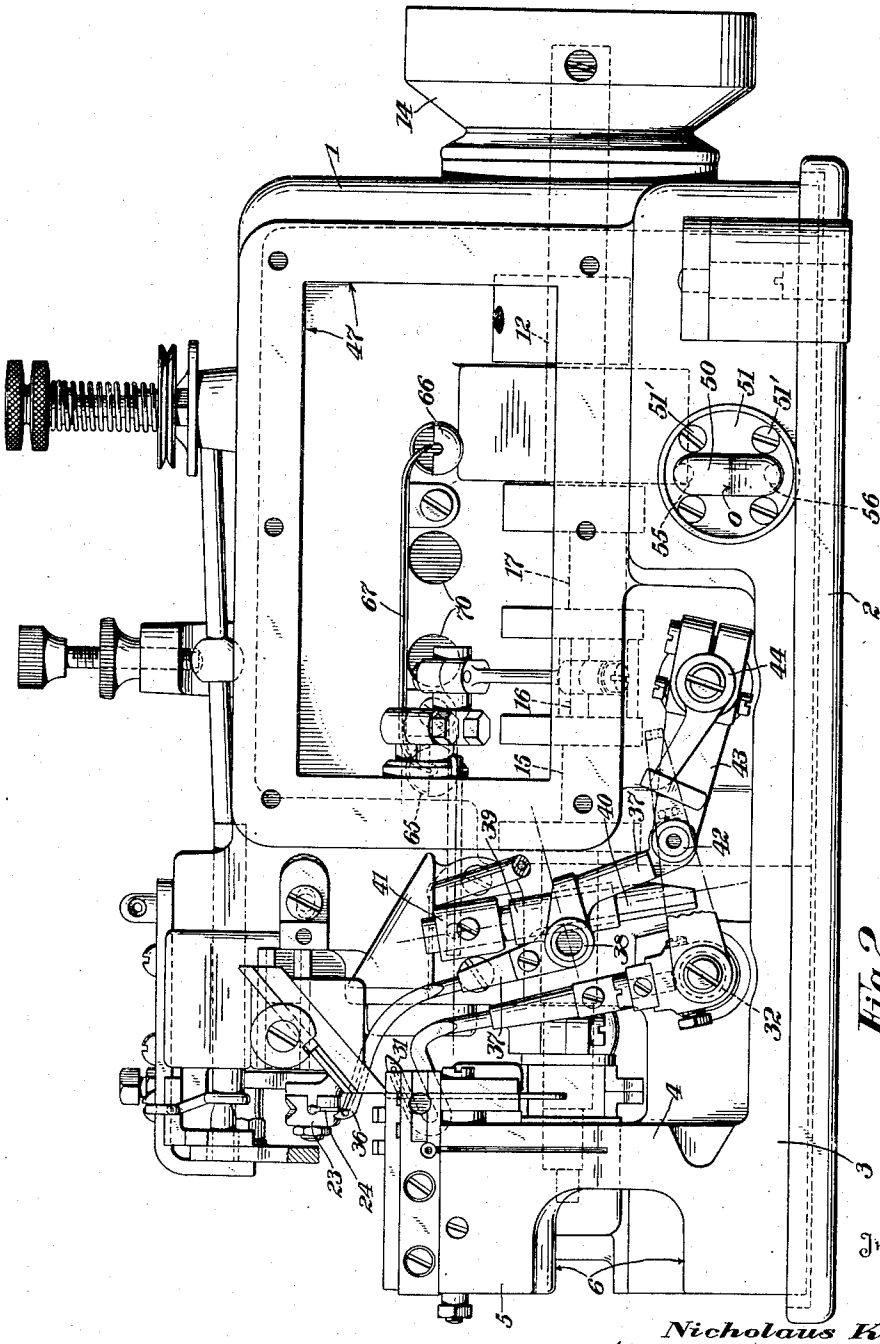


Fig 2.

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LUBRICATING SYSTEM FOR SEWING MACHINES

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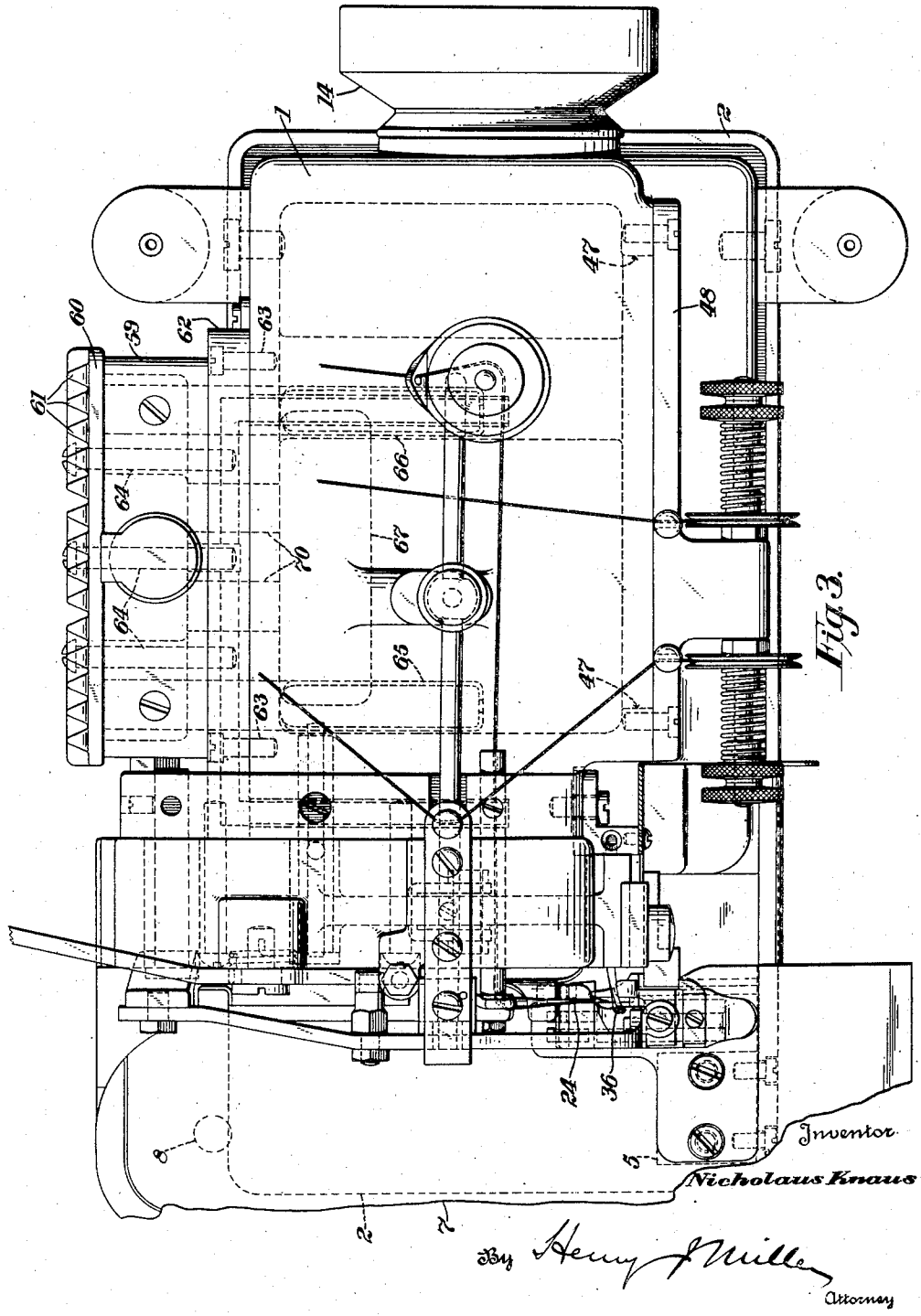


Fig. 3.

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LUBRICATING SYSTEM FOR SEWING MACHINES

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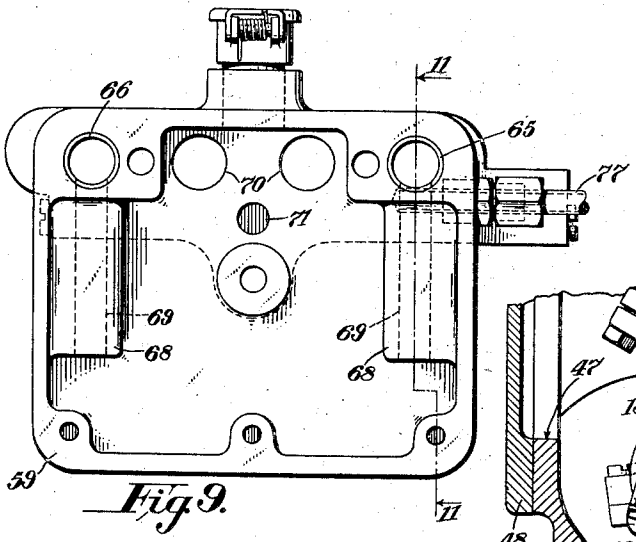


Fig. 9.

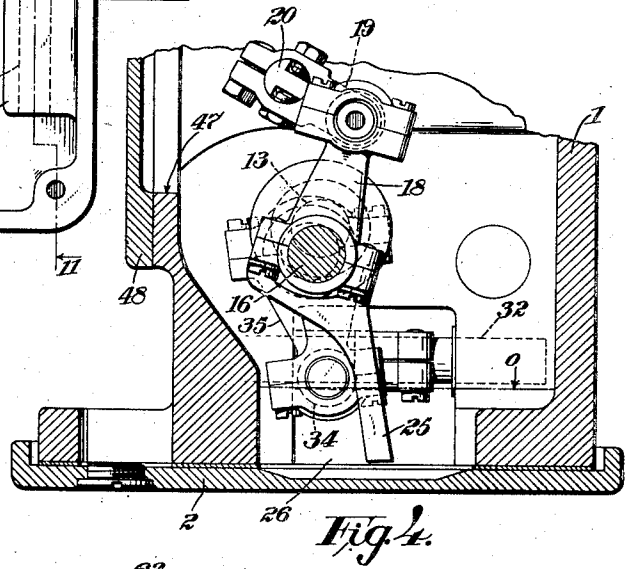


Fig. 4.

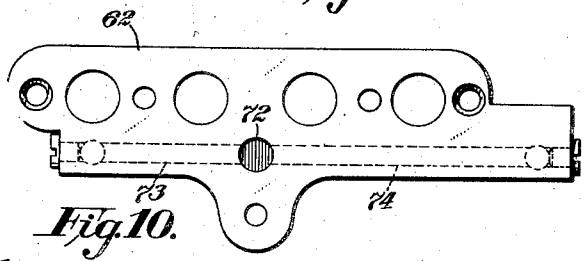


Fig. 10.

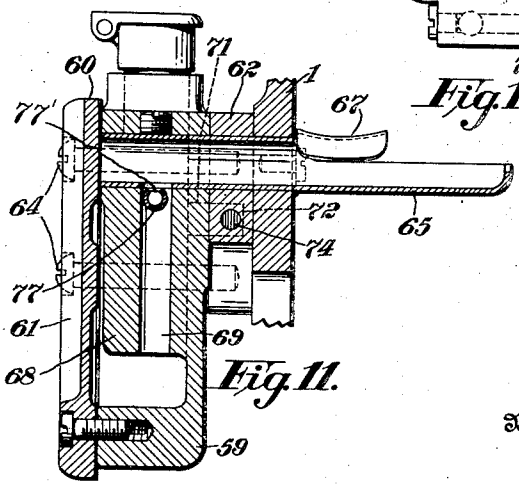


Fig. 11.

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LUBRICATING SYSTEM FOR SEWING MACHINES

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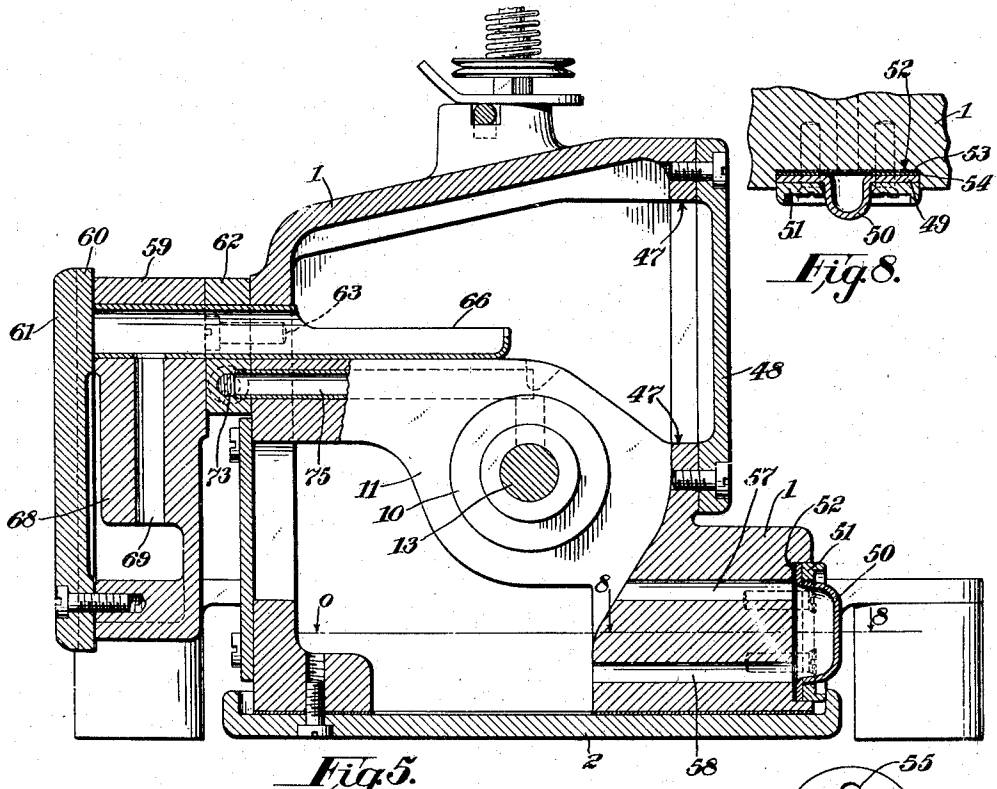


Fig. 5.

Fig. 8.

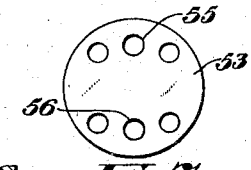


Fig. 7.

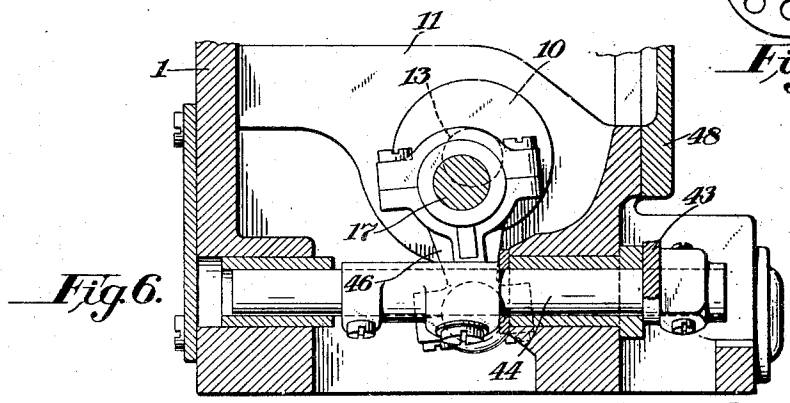


Fig. 6.

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UNITED STATES PATENT OFFICE

2,238,797

LUBRICATING SYSTEM FOR SEWING MACHINES

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Original application June 10, 1939, Serial No. 278,393. Divided and this application August 18, 1939, Serial No. 290,725

5 Claims. (Cl. 184—6)

This invention relates to sewing machines, more particularly of the overedge stitching type using a needle, an under or needle-loop-taking looper and an overedge looper, all coordinated to sew an overseam encompassing an edge of material presented to the machine.

An object of the invention is to provide the machine with an improved and simplified lubricating system enabling high-speed operation to be maintained without undue wear and tear on the machine.

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.

In the accompanying drawings, Fig. 1 is a longitudinal vertical section through a sewing machine embodying the invention. Fig. 2 is a front view of the machine with certain cover-plates removed to expose the loopers. Fig. 3 is a top plan view of the machine. Fig. 4 is a section on the line 4—4, Fig. 1. Fig. 5 is a transverse vertical section substantially on the line 5—5, Fig. 1. Fig. 6 is a section substantially on the line 6—6, Fig. 1. Fig. 7 is an elevation of the oil-gauge reflecting liner. Fig. 8 is a section on the line 8—8, Fig. 5. Fig. 9 is an elevation of the inside of the oil-heat radiator with the outside cover-plate removed. Fig. 10 is an elevation of the back mounting plate for the oil-heat radiator and Fig. 11 is a section on the line 11—11, Fig. 9.

This application is a division of my copending application, Serial No. 278,393, filed June 10, 1939.

The sewing machine is constructed with a frame including a hollow oil-tight casing or main compartment 1 closed below by means of the removable aluminum bottom plate 2. At the left end of the hollow casing 1, Fig. 2, is a base extension 3 from which rises the pedestal 4 of a work-supporting horn 5 around which tubular work may be passed for tube-end overseaming operations. The horn 5 projects away from the hollow casing 1 and the work-return space 6 thereunder is clear of mechanism. To use this horn and the space thereunder, the usual cloth-plate 7, Fig. 3, is swung to the left about its pivot 8, to an open or out-of-the-way position.

Journaled in the frame bearing bushing 9, Fig. 1, and in the bushing 10 in the internal frame cross-rib 11, and also in the end ball bearing 12, is the main-shaft 13 carrying the belt-pulley and hand-wheel 14. The main-shaft 13 is formed, in that portion thereof within the oil-tight casing 1 and between the bearing bushings 9, 10, with three cranks 15, 16, and 17.

The intermediate crank 16, Figs. 1 and 4, which is lubricated directly by splash lubrication, is connected by the pitman 18 to the crank-arm 19 on the hollow rock-shaft 20 journaled in the frame bearing bushing 21 and formed at its outer end with the arm 22 carrying the clamp 23 for the curved eye-pointed needle 24. The pitman 18 carries the downwardly extending oil agitator 25, Fig. 4, which dips into oil in the sump 26; the oil being maintained at the oil-level *o* in the sump at the bottom of the oil-tight casing 1. The bearing between the rock-shaft 20, Fig. 1, and bushing 21 is lubricated by oil-mist which collects or condenses in the internal frame cut 27 and drips into the external groove 28 extending longitudinally of the bushing 21 and through the port 29 to the internal circumferential oil-distributing groove 30.

Cooperating with the needle 24 is the under or needle-loop-taking looper 31, Fig. 2. The looper 31 is mounted on the rock-shaft 32 to which is fixed the crank-arm 33, Fig. 1, having at its free end a ball 34 embraced by the lower socketed end of a pitman 35 driven by the crank 15 on the main-shaft 13.

Cooperating with the under looper 31 and needle 24 is the overedge looper 36 which is secured to a lever 37 fulcrumed on a pin 38 carried by a sleeve 39 which slides on the stationary pin 40 fixed in the frame-lug 41. The lever 37 is pivoted at 42 to the crank-arm 43 which is fast on the rock-shaft 44 journaled in the frame casing 1 and has fixed thereto a crank-arm 45 actuated by the pitman 46 from the crank 17 on the main-shaft 13.

The hollow frame casing or main compartment has a large window 47, Fig. 2, in its front face for access to the working parts within the casing 1. This window is normally closed oil-tight by the plate 48, Figs. 3 and 5. Below the plate 48 is an oil sight gauge comprising a transparent window-disk 49 of cellulose acetate thermoplastic material or other suitable transparent plastic material insoluble in oil, having a forwardly bulging diametrical portion 50 projecting through a diametrical slot in a clamping plate 51 secured by screws 51' to a recessed circular seat 52, Fig. 8, in the base-portion of the frame casing 1. Be-

tween the plate 51 and seat 52 are interposed a white reflector sheet 53 and a gasket 54. The reflector sheet is apertured for the four screws 51' and is further apertured at 55 and 56 in register with the respective ports 57 and 58 leading into the oil-chamber in the casing 1. The gasket is diametrically slotted to expose the white sheet reflector 53 back of the bulged portion 50 of the oil gauge window 49. The oil level should be maintained at the halfway mark in the gauge.

On the rear wall of the casing or main compartment 1 is mounted the oil-heat radiating subcompartment 59 which is preferably a cast aluminum alloy box-like member closed at its rear side by the removable plate 60 formed with heat-radiating ribs or fins 61. It will be seen in Fig. 5 that the radiator box 59 constitutes oil-storage means disposed practically wholly above the oil level o in the casing 1. Also, the box 59 is spaced away from the rear wall of the frame casing to permit circulation of air therebetween. This spacing is provided by screwing the box 59 to a spacer-bar 62 which is itself screwed at 63, Figs. 3 and 5, to the frame casing rear wall. The box cover 60 and box 59 are secured together and to the spacer-bar 62 by the three long screws 64, Fig. 3.

The box 59 has fixed in apertures in the wall thereof adjacent the machine, the horizontal spoon-mouthed oil-catching inlet tubes 65, 66, which extend through the spacer-bar 62 into the oil-splash cavity within the frame casing 1. Mounted within the oil-splash cavity in the casing 1 is the oil-spray-catching shelf or shallow trough 67 which is disposed horizontally and drains at its opposite ends into the spoon mouths of the oil-inlet tubes 65, 66.

The box 59 is formed internally with end lugs 68 bored vertically to provide ducts 69 to conduct the heated incoming oil from the tubes 65, 66 to the bottom of the box and discharge the heated incoming oil into the bottom of the box from whence it will rise and mix with the cooler oil already in the box and be cooled thereby. The box 59 is formed with oil-overflow or oil-return holes 70 which register with similar holes in the spacer-bar 62 and rear wall of the frame casing 1 and allow cooled oil from the heat-radiator box 59 to flow back into the casing 1 and return to the sump at the bottom of the latter. The lower portions of the walls of these overflow openings 70 are below the level of the mouths of the oil-splash catchers 65 and 66.

The box 59 is formed below the outflow holes with a port 71 leading through the registering port 72 in the spacer-bar 62 to the ports 73 and 74 running lengthwise of the spacer-bar 62 and connecting, respectively, with the ports 75 and 76 leading to the main-shaft bearings 10 and 9. A pipe 77, Figs. 9 and 11, enters one end wall of the radiator box 59 below the level of the inlet pipe 65, Figs. 9 and 11, and intersects the port 69, wherein the pipe 77 has a mouth 77' receiving oil from the spoon-mouthed inlet pipe 65 and conducting oil to any desired part or bearing to be lubricated.

Any excess of oil from the feed-eccentrics 78 and trimming mechanism 79, Fig. 1, gravitates to and collects in the oil-pocket 80 in the base-extension 3 and filters through the screen 81 into the port 82 leading to the felt pad 83 in a pocket 84 in communication with the oil-sump within the casing 1.

The invention is not limited in its application to an overedge sewing machine but may obviously be applied to any sewing machine having an oil-tight casing containing oil which becomes heated in use.

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

1. A sewing machine having a frame including a hollow oil-tight casing, stitch-forming and work-feeding mechanism incorporated in said frame and including working parts disposed within said casing for oil-splash lubrication, a hollow heat-radiator disposed externally of said casing, a spoon-mouthed conduit extending through a wall of said casing to catch oil splashed in said casing and conduct it by gravity to a discharge point in the lower portion of said heat-radiator, said heat-radiator having a return oil-overflow duct in the upper portion thereof in communication with the space within said casing.

2. The combination with a hollow oil-tight sewing machine frame having a side wall opening, of an oil-heat-radiating vessel detachably closing said opening and having fixed thereto one or more spoon-mouthed oil-catching lead-in tubes projecting into said hollow frame, said vessel also having an oil-overflow opening in register with said sewing machine side-wall opening, and means in said sewing machine frame to splash a supply of oil therein at a level below said side-wall opening.

3. The combination with a sewing machine frame having an oil-tight compartment containing a supply of oil, of an oil-heat-radiating vessel on said frame and including an oil-splash-catcher having a spoon-mouth exposed to oil-mist in said hollow frame and a duct to lead the oil caught by said mouth into said vessel, said vessel having an oil-overflow opening disposed below the level of the mouth of said oil-splash-catcher and in communication with the space within said hollow sewing machine frame above the oil-level therein.

4. The combination with a sewing machine frame having an oil-tight compartment, of an oil-heat-radiating vessel detachably mounted on said frame and including an oil-splash-catcher fixed thereto and having a spoon-mouth exposed to oil-mist in said hollow frame and a duct to lead the oil caught by said mouth into said vessel, said vessel having an oil-overflow opening disposed below the level of the mouth of said oil-splash-catcher and in communication with the space within said hollow sewing machine frame.

5. A sewing machine having a hollow oil-tight frame casing, a horizontal main-shaft and crank-driven connections therewith contained in said casing, oil contained in said casing at a level below said main-shaft, means to splash the oil in said casing, a hollow oil-heat-radiator separate from and mounted on said casing exteriorly of the latter, a gravity fed conduit having an open oil-splash-catching mouth disposed in said frame casing above the oil-level therein and draining through a wall of said casing into said oil-heat-radiator, and an oil-overflow duct leading from said oil-heat-radiator into said frame-casing above the oil-level in the latter and below the level of said oil-splash-catching mouth.

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