Nov. 30, 1926. 1,608,608

A. MARTIN

DETACHABLE DRIVING UNIT

Filed August 27, 1924 3 Sheets-Sheet 1

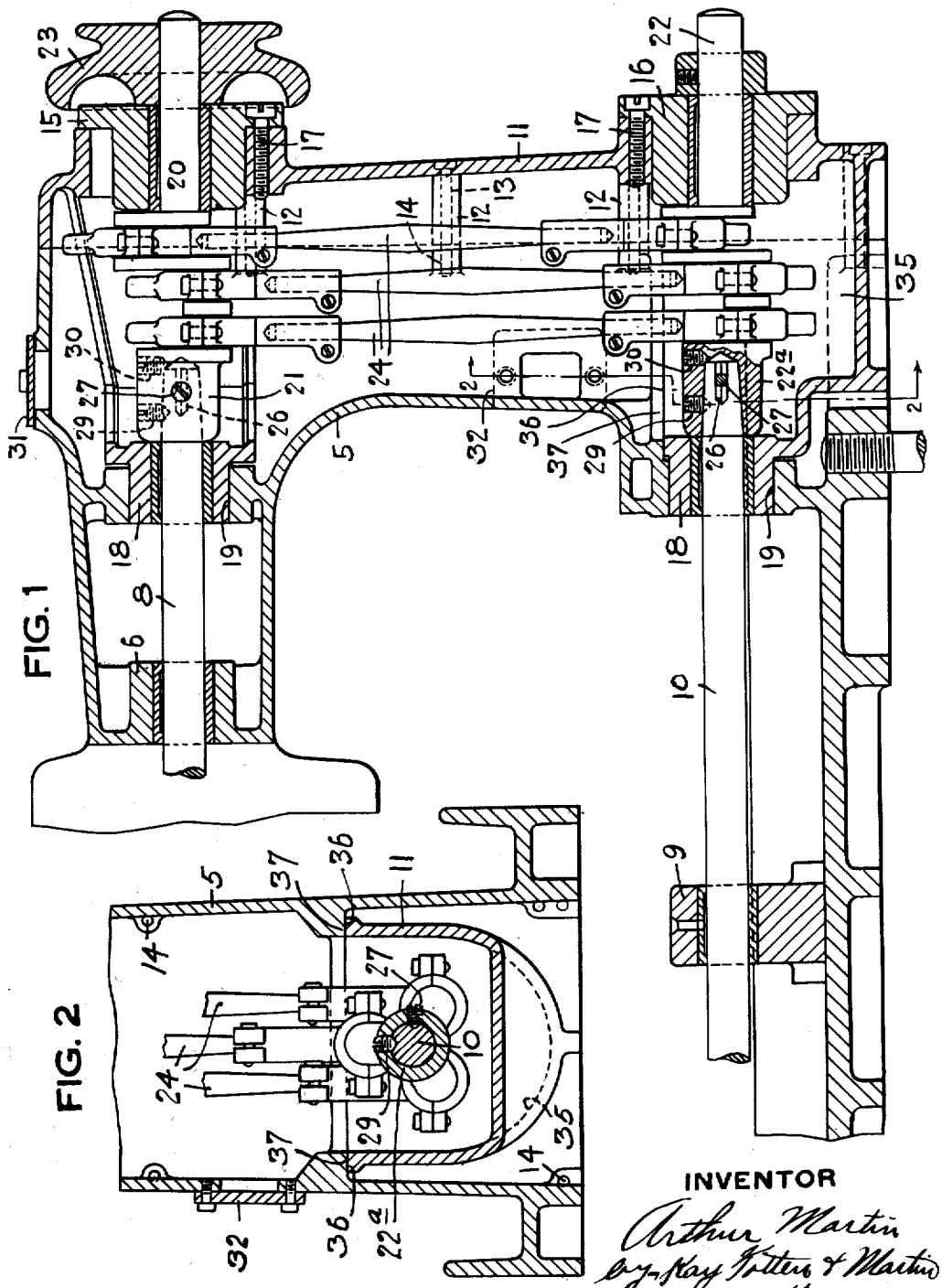


FIG. 1

FIG. 2

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DETACHABLE DRIVING UNIT

Filed August 27 1924 3 Sheets-Sheet 2

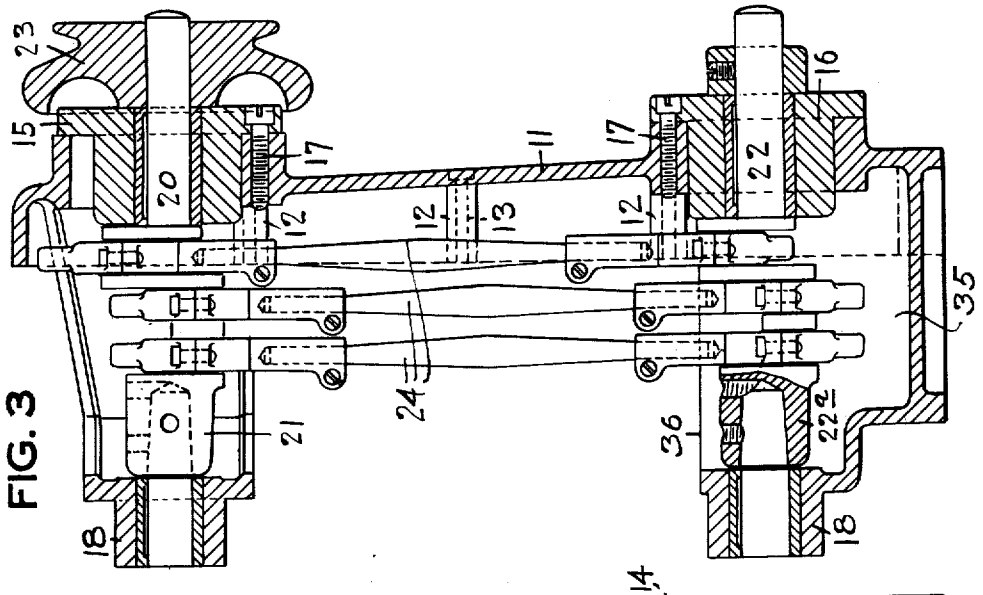


FIG. 3

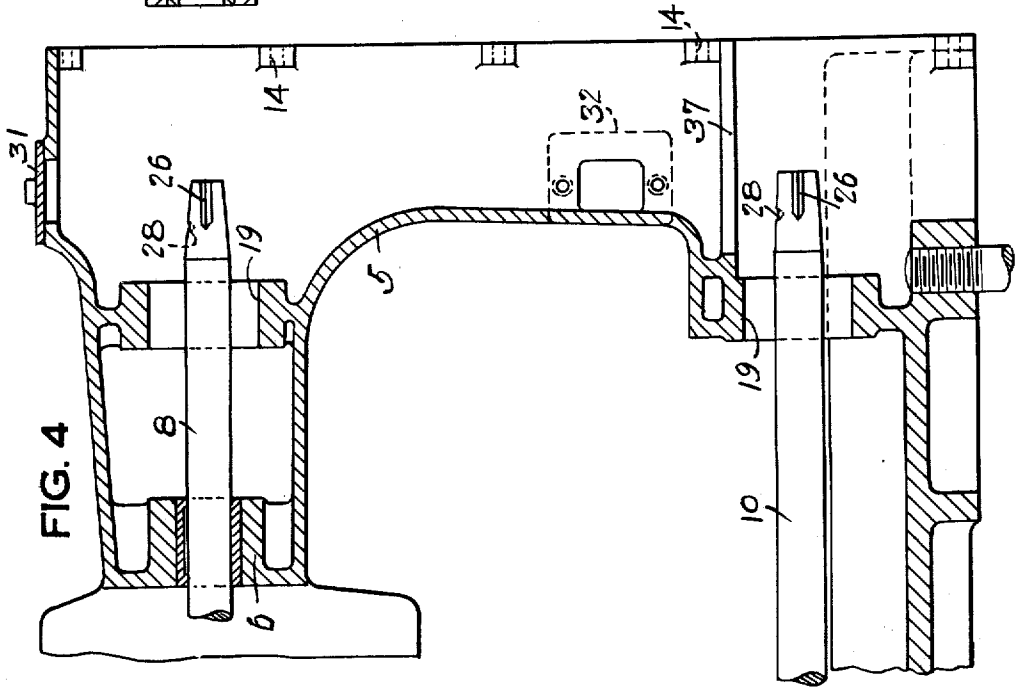


FIG. 4

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DETACHABLE DRIVING UNIT

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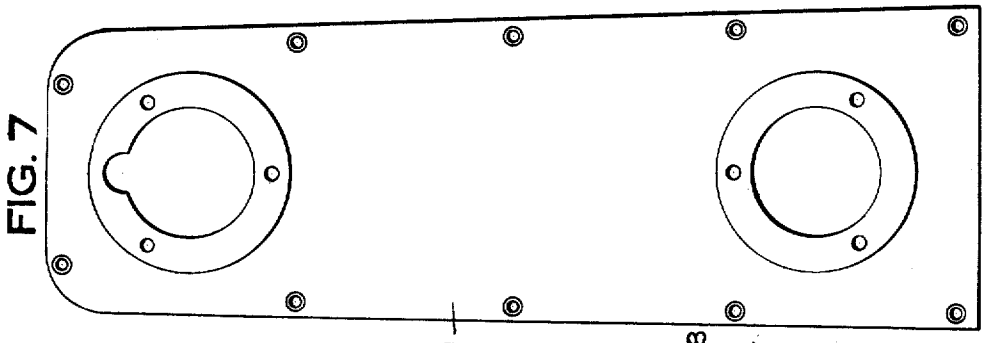


FIG. 7

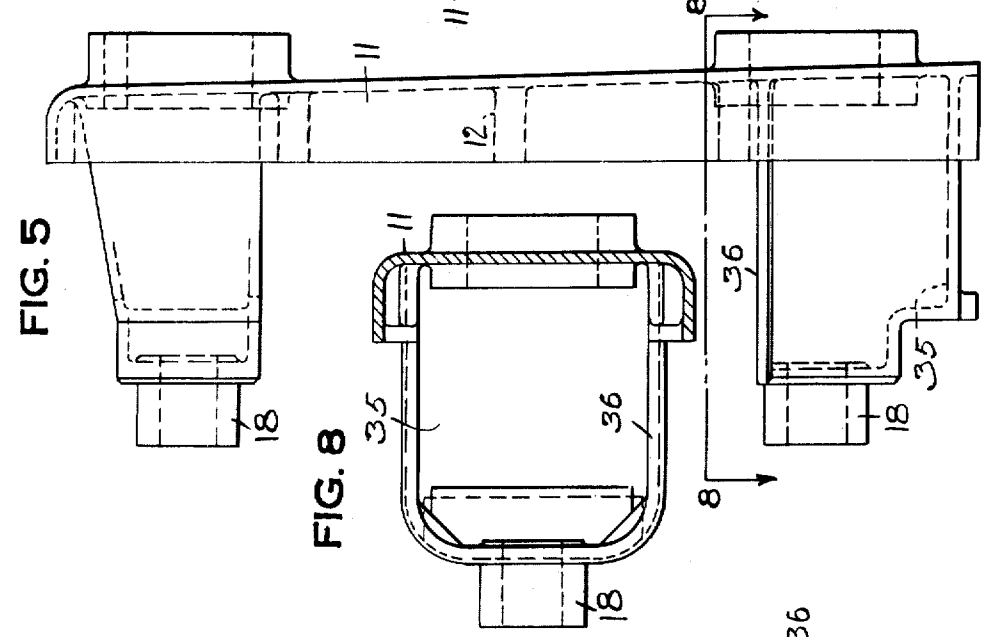


FIG. 5

FIG. 8

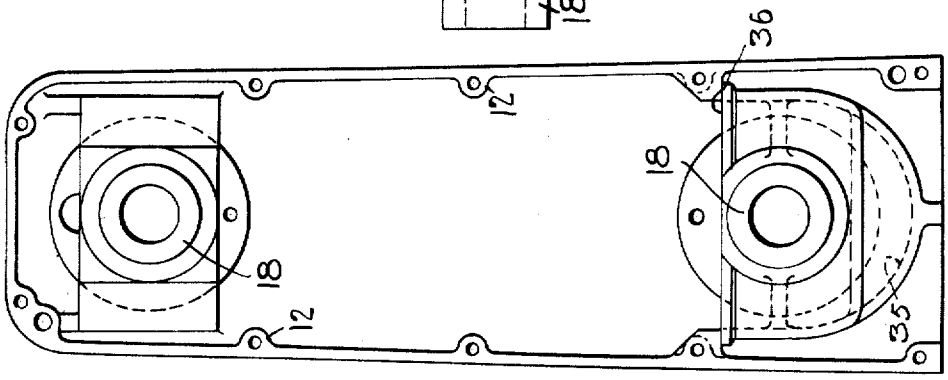


FIG. 6

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Patented Nov. 30, 1926. 1,608,608

UNITED STATES PATENT OFFICE.

ARTHUR MARTIN, OF CHICAGO, ILLINOIS.

DETACHABLE DRIVING UNIT.

Application filed August 27, 1924. Serial No. 734,464.

My invention relates to detachable driving units, and is particularly applicable for use in connection with the needle bar shafts and looping mechanism shafts of sewing machines, although it will be understood that the invention is useful in various other relations.

One of the objects of my invention is to provide a detachable unit drive for industrial sewing machines and other machines, which is interchangeable, and the parts of which are conveniently accessible.

Another object of my invention is to provide an improved form of connection between the driving unit and the parts which are to be driven thereby.

Still another object of my invention is to simplify and improve generally the structure and operation of power transmitting mechanisms.

For convenience of illustration I have shown my invention as adapted for use in connection with a sewing machine, but it will be understood that the scope of the invention is limited only by the claims.

One form which my invention may take is shown in the accompanying drawing wherein Fig. 1 is a sectional view, in side elevation, of a driving unit embodying my invention and a portion of a sewing machine to which said unit is applied; Fig. 2 is a sectional view, taken on the line 2—2 of Fig. 1; Fig. 3 is a view of the driving unit of Fig. 1, removed from the sewing machine; Fig. 4 is a view of the sewing machine portion of Fig. 1 with the driving unit removed; Fig. 5 is a view, in side elevation, of the casing for the driving unit; Figs. 6 and 7 are end elevational views of the casing of Fig. 5, and Fig. 8 is a view taken on the line 8—8 of Fig. 5.

The driving unit is shown as applied to a sewing machine casting 5 that contains a bearing 6 for a needle bar operating shaft 8 (only a portion of which is shown) and a bearing 9 for a looper mechanism shaft 10. The sewing machine mechanism, which is not shown, may be of conventional form. The driving unit is provided with a casing or housing 11 which is open at its left-hand side and is provided with a plurality of stud pads 12 formed integrally therewith through which screws 13 may extend into engagement with threaded or tapped holes 14 on the sewing machine casting 5. The casting 11 is provided with openings for the reception of bearing blocks 15 and 16 that are secured in place by screws 17 which have threaded engagement with the casting 11. The casting 11 is also provided with two forwardly extending outboard bearing portions 18 that are adapted to seat within accurately bored openings 19 formed within the casting 5.

Two three throw crank shafts 20 and 22 are supported in bearings 15 and 16 and are provided on their outer ends with tapered coupling sockets 21 and 22ª, for the reception of the inner end of the shafts 8 and 10.

The shaft 20 is driven through the medium of the usual combined balance and band wheel pulley 23 and drives the shaft 22 through the medium of three connecting rods 24 that are connected at their respective ends to the shafts 20 and 22 by means of the usual connecting straps eccentrically joined to the shafts 20 and 22.

By reference to Fig. 3 it will be seen that the casting 11 and the parts carried thereby, when detached from the sewing machine casting 5, may be easily disassembled. Heretofore it has been the practice to assemble all the small parts associated with the crank shafts, through openings in the arm and bed castings of the sewing machines and then closing such openings by means of cover plates. By my construction the interior of the casting 11, when removed from the casting 5, is fully exposed.

In bringing the apparatus of Figs. 3 and 4 into the assembled relation shown in Fig. 1, the inner tapered ends of the shafts 8 and 10 are caused to enter the sockets 21 and 22ª, respectively, of the shafts 20 and 22. The screws 13 may then be tightened up to hold the castings 11 and 5 in assembled relation, the shafts 8 and 20, and 10 and 22, are then connected in the following manner. In order to procure proper circumferential adjustment of the shaft 8

relative to the shaft 10 these shafts are each provided with a longitudinal slot 26 into which the inner ends of screws 27 carried by the coupling sockets 21 and 22ª may be driven, thereby insuring proper cooperative relation between the mechanisms (not shown) to which outer ends of the shafts 8 and 10 are respectively connected.

The shafts 8 and 10 are also each provided with a tapered recess or spot hole 28 for the reception of a set screw 29. The axes of each recess 28 and its associated screw 29 are offset longitudinally of the shaft so that when the screw is driven home the shaft 8, for example, will be drawn tightly to its seat within the socket 21.

The sockets 21 and 22ª are also each provided with a tapered screw 30. In disassembling the driving unit, the screws 27 and 29 are first retracted. The screws 30 are then driven inwardly so as to engage the inner ends of the shafts 8 and 10 to start said shafts from their seats within the sockets 21 and 22ª.

Access to the screws 27, 29 and 30 is had through the cover plates 31 and 32, the openings covered by these plates being sufficiently large to permit the insertion of a screw driver. Thus the only assembling or disassembling operations from the exterior of the casing are those requiring a loosening of the screws just referred to, and the driving unit may be readily removed for substitution of another or for inspection and repairs to the mechanism contained therein.

An oil reservoir 35 is provided in the casing 11. The flanged edge 36 of this reservoir fits snugly against the ledge 37 of the casting 5, so that when the castings 5 and 11 are assembled, with the outboard bearings 18 fitted into the openings 19, an oil-tight compartment is provided for the connecting rods 24 and the mechanism associated therewith. Sufficient depth of oil is maintained in the reservoir 35 to enable the crank shaft 22 to spray it throughout the housing 11, to lubricate the upper bearings.

When the machine comes to rest, the oil settles back into the reservoir and the casing 11 can then be removed without spilling the oil.

It will be apparent that various changes in details may be made without departing from the spirit and scope of the invention as defined in the accompanying claims.

I claim as my invention:

1. The combination with a sewing machine casing containing a needle bar shaft and a looper shaft, of a driving unit comprising a casing containing a pair of three-throw crank shafts having connection with one another and each adapted to be connected to one of the two first-named shafts, the said casing being open at its side which is adjacent to the main frame, and one of said casings, having openings to permit operation of the connections between the two first-named shafts and the three-throw shafts from exteriorly of such casing.

2. The combination with a main casing, of an auxiliary casing having shafts therein and adapted to be secured to said casing, bearing supports in said main casing, and outboard bearings on said auxiliary casing for said shafts, adapted to engage said bearing supports when the housing and casing are assembled.

3. The combination with a main casing containing transmission shafts, of an auxiliary casing having shafts therein and adapted to be secured to said main casing, bearing members in said main casing, outboard bearings for the last-named shafts to engage said bearing members when the housing and casing are assembled, and means for securing the shafts of the auxiliary casing to those of the main casing.

4. The combination with a sewing machine casing containing a needle bar shaft and a looper shaft, of a driving unit comprising a detachable auxiliary casing open at one side and containing a pair of crank shafts having driving connection with one another and each adapted to be connected to one of the two first-named shafts when the auxiliary casing is secured at its open side to the first-named casing.

5. The combination with a main casing containing two shafts, of an auxiliary casing open at one side, a driving shaft mounted in said auxiliary casing, a driven shaft mounted therein, a driving connection between said last named shafts, and means for detachably mounting the auxiliary casing with its open side against the main casing and with the last named shafts in co-operative relation to the first-named shafts.

6. The combination with a main casing containing a pair of shafts, of an auxiliary casing open at one side, a pair of shafts carried by the auxiliary casing, a driving connection between the shafts composing one of said pairs, and means for detachably mounting the auxiliary casing with its open side against the main casing and with each one of its shafts in cooperative relation to one of the shafts in the main casing.

7. The combination with a main casing having a perforation in one wall thereof, of an auxiliary casing having an open side and adapted to be secured to said main casing with its open side opposite to said wall, to form a closed chamber for transmission mechanism mounted therein, an oil reservoir formed in the bottom of said auxiliary casing, a shaft bearing on the inner end wall of said reservoir and snugly fitting said perforation, and a shaft extending through said bearing into the reservoir.

8. The combination with a main casing

having an open side undercut at its lower end and a perforation, of an auxiliary casing having an open side with a horizontally extending reservoir at its lower end, whose upper edge is substantially coextensive with the said undercut portion of the main casing, a shaft-bearing portion in the end wall of the reservoir below said undercut portion, and means for securing said open sides of the two casings together to form a closed chamber for transmission mechanism, the exterior wall of the shaft-bearing portion having snug-fitting engagement with said perforation.

In testimony whereof I, the said ARTHUR MARTIN, have hereunto set my hand.

ARTHUR MARTIN.