

W. H. HUGG.
SEWING MACHINE.
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1,005,645.

Patented Oct. 10, 1911.

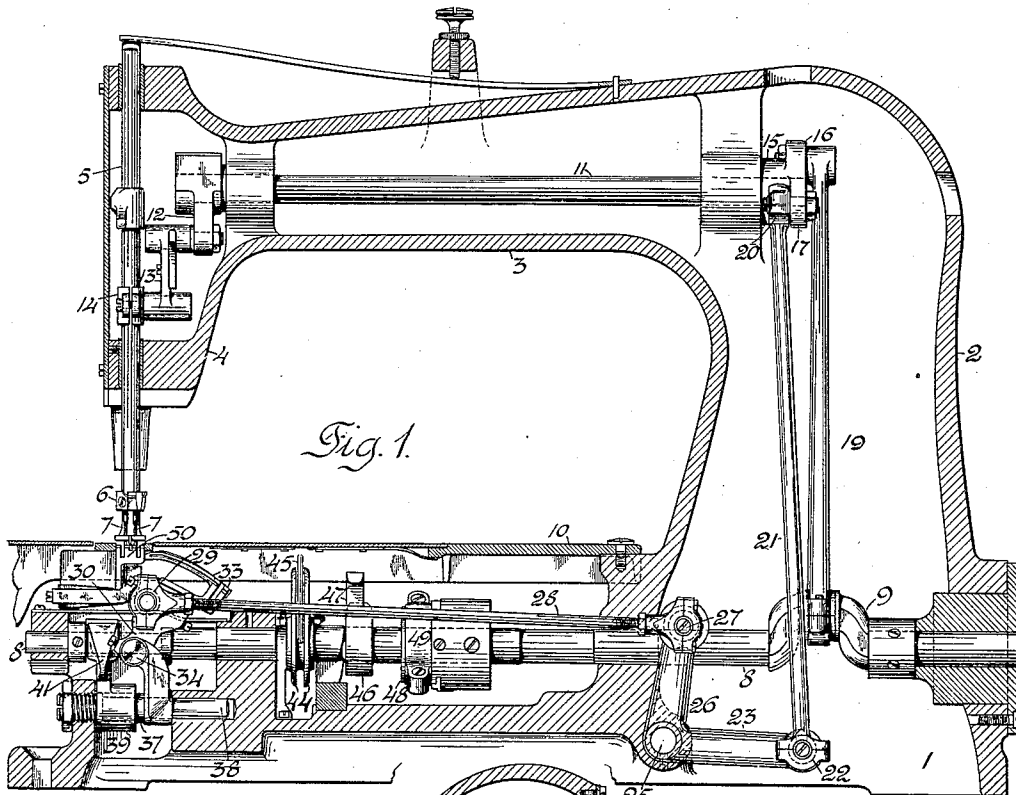


Fig. 1.

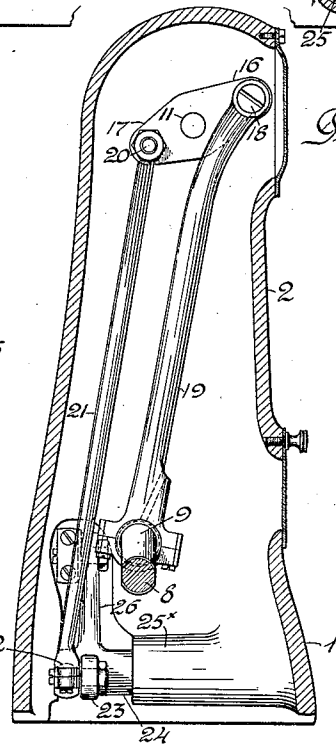


Fig. 2.

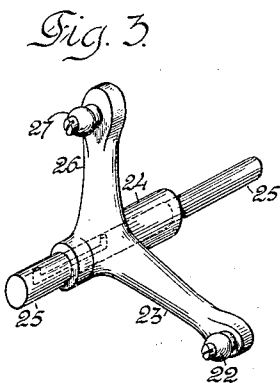


Fig. 3.

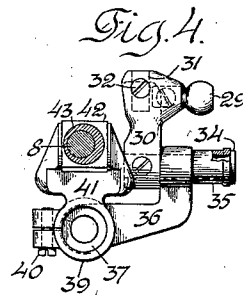


Fig. 4.

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SEWING-MACHINE.

1,005,645.

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To all whom it may concern:

Be it known that I, WILLIAM H. HUGG, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to an improvement in the needle and loop-taker driving mechanisms for sewing machines, and it has for its primary object a construction and arrangement for such mechanisms whereby the operative movements of the one are compensated for by those of the other, so as to produce a minimum vibration of the machine when driven at the high speeds demanded at the present time of machines employed for manufacturing purposes.

15 In its preferred form the machine is constructed with a driving shaft journaled longitudinally within the bed beneath the work-plate and having an operative connection with a crank-arm upon the oscillating needle-driving shaft which has an oppositely disposed crank-arm connected with a lateral arm of an angle-lever fulcrumed in the bed of the machine transversely of the main-shaft and having an upwardly extending arm connected by means of a pitman with the oscillating loop-taker, in the present instance consisting of a thread-carrying looper having its blade disposed crosswise of the line of feed and receiving its loop-taking and loop-shedding movements in the same direction.

20 In double-chain-stitch machines, of which the machine represented in the accompanying drawings is an example, it is desirable that the rotary driving shaft should be disposed beneath the work-plate and preferably longitudinally of the bed, whereby the loop-taker may be given its sidewise or needle-avoiding movements from an eccentric upon the forward end of such shaft, while the other lower-thread handling devices and the feeding mechanism may receive their actuations directly from the driving shaft, thus adapting the machine for operation at high speeds. It is also of importance that the reciprocatory movements of the needle and the loop-taker should each compensate for the other, and this is effected in the present machine by the provision of a rock-

ing member upon the needle-actuating shaft comprising the oppositely extending crank-arms, which are preferably proportioned in length to compensate for the work which each performs and the weight of the connected reciprocating parts. By driving both the needle and the loop-taker from the same rock-shaft it is evident that the correct timing of these component members of the stitch-forming mechanism will be insured at all times.

The present invention will be understood by reference to the accompanying drawings, in which—

Figure 1 is a sectional front side elevation of a sewing machine embodying the present improvements, and Fig. 2 a transverse sectional elevation of the same through the upright portion of the bracket-arm, looking forwardly. Fig. 3 is a perspective view of the looper-actuating angle-lever, and Fig. 4 a sectional elevation of the driving shaft and the actuating eccentric thereon with the looper-carrier and the yoke embracing said eccentric.

The present machine is constructed with the usual base 1 and bracket-arm comprising the hollow upright portion 2 and overhanging member 3 in the head 4 of which is journaled the vertically reciprocating needle-bar 5 provided, in the present instance, with the twin needle-clamp 6 carrying the eye-pointed needles 7.

The longitudinally arranged main or driving shaft 8 is journaled in suitable bearings in the base 1 beneath the work-plate 10 and is provided near its rearward end with an actuating crank 9, and in practice receives its motion from the usual pulley mounted upon its rearward end. The needle-actuating rock-shaft 11 is journaled in suitable bearings within and longitudinally of the overhanging bracket-arm and carries at its forward end a crank-arm 12 having a pin connected by means of the usual link 13 with a rearwardly projecting stud carried by a collar 14 fixed upon the needle-bar 5, from which connections the needles receive their operative movements from the rock-shaft 11, which has fixed upon its rearward end a rocking member 15 with oppositely extending crank-arms 16 and 17, the former of which is provided with a stud-screw 18 embraced by the upper end of a pitman-rod 19 whose opposite end embraces the crank

9 of the driving shaft 8 from which the needle-actuating rock-shaft 11 derives its rocking movements. The second crank-arm 17 of the rocking member 15 carries a ball-crank-pin 20 embraced by the upper end of a pitman 21 whose lower end embraces a ball-crank-pin 22 carried by the rearwardly extending arm 23 of an angle-lever whose hub 24 is fitted upon the fulcrum-pin 25 mounted in the bearing boss 25* in the base 1 transversely of the driving shaft, the upwardly extending arm 26 of the angle-lever carrying a ball-crank-pin 27 embraced by the rearward end of a pitman 28 whose forward end embraces a ball-crank-pin 29 laterally projecting from the looper-carrier 30.

The looper carrier 30 is provided with sockets 31 in which are secured by means of the fastening screws 32 the shanks of a pair of thread-carrying loopers 33 whose blades are disposed parallel with the plane of the parallel upper and lower shafts and are adapted to cooperate with the needles 7 in the production of parallel double-chain-stitch seams.

The looper-carrier 30 is fixed upon a fulcrum-stud 34 journaled in the lateral bearing boss 35 of an arm 36 having a hub 37 fixed upon the longitudinal rock-shaft 38 and having secured upon its hub the split collar 39 clamped thereon by means of the screw 40 and having an upright arm 41 forked to embrace a wearing block 42 fitted upon an eccentric 43 upon the forward end of the driving shaft 8.

As will be observed, the needle-actuating shaft 11 derives its rocking movements from the main or driving shaft 8 through the pitman connection 19 with the lateral crank-arm 16, thus communicating to the needles their vertical reciprocating movements; while the pitman connection intermediate the oppositely disposed crank-arm 17 and the angle-lever 23 26, itself connected through the pitman 28 with the looper-carrier 30, imparts to the loopers their to-and-fro loop-seizing and loop-shedding movements in planes parallel with the shafts 8 and 11 in the production of stitches. As will be observed, the loopers derive their sidewise or needle-avoiding movements directly from the eccentric 43 upon the driving shaft through the rocking arms 36 and 41, the latter carrying the transversely disposed fulcrum-stud 34.

Similarly to other machines of the class described, the main-shaft 8 carries the take-up cam disks 44 with the interposed thread-finger 45 and is also provided with the thread-nipper actuating cam 46 acting in conjunction with a member of the thread-nipping device 47 of well-known construction.

The machine is provided with any usual or suitable feeding mechanism, being herein

shown comprising an actuating eccentric 48 upon the driving shaft embraced by a strap 49 of a rod in practice connected with the usual feed-rocker from which the feed-dog 50 derives its to-and-fro feeding movements transversely of the driving shaft and of the machine bed.

While the construction and arrangement of the several members of the present improvement shown and described herein are considered desirable, it will be understood that the present invention is susceptible of considerable modification of the preferable embodiment herein disclosed.

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

1. In a sewing machine, the combination with the frame comprising the bed and the overhanging bracket-arm, and a driving shaft journaled in said frame, of a reciprocating needle and a cooperating reciprocatory loop-taker, a needle-actuating rock-shaft mounted in and disposed longitudinally of the bracket-arm, operative connections intermediate the needle and said rock-shaft, oppositely extending crank-arms upon said rock-shaft, an operative connection intermediate one of said crank-arms and the driving shaft, an angle-lever, a fulcrum therefor mounted upon said bed transversely of the driving shaft, a pitman connection intermediate a second arm upon said rock-shaft and an arm of said angle-lever, and a link connection intermediate the other arm of said angle-lever and the loop-taker.

2. In a sewing machine, the combination with the frame comprising the bed and the overhanging bracket-arm, and a driving shaft journaled in and disposed longitudinally of the bed, of a reciprocating needle and a cooperating reciprocatory loop-taker, a needle-actuating rock-shaft mounted in and disposed longitudinally of the bracket-arm, operative connections intermediate the needle and said rock-shaft, oppositely extending crank-arms upon said rock-shaft, an operative connection intermediate one of said crank-arms and the main-shaft, an angle-lever pivotally mounted upon said bed, a pitman connection intermediate a second of the arms upon said rock-shaft and an arm of said angle-lever, an operative connection intermediate the other arm of said angle-lever and the loop-taker for communicating to the latter loop-seizing and loop-shedding movements, and an independent connection between the driving shaft and the loop-taker for imparting to the latter needle-avoiding movements.

3. In a sewing machine, the combination with the frame, and a driving shaft journaled therein, of a reciprocating needle and a cooperating reciprocatory loop-taker, a needle-actuating rock-shaft mounted in said frame parallel with the driving shaft, an

oscillatory loop-taker actuating member journaled in said frame transversely of the main-shaft, an operative connection intermediate the needle and said rock-shaft, oppositely extending crank-arms upon said rock-shaft, an operative connection intermediate one of said crank-arms and the driving shaft, a pitman connection intermediate a second of the arms upon said rock-shaft and said loop-taker actuating member, and a link connection intermediate said member and the loop-taker.

4. In a sewing machine, the combination with the frame, and a driving shaft journaled therein, of a reciprocating needle and a cooperating reciprocatory thread-carrying loop-taker, a needle actuating rock-shaft mounted in said frame parallel with the driving shaft, an operative connection intermediate the needle and said rock-shaft, oppositely-extending crank-arms upon said rock-shaft, an operative connection intermediate one of said crank-arms and the main-shaft, operative connections intermediate the other of said crank-arms and the loop-taker for imparting thereto movements in a plane parallel with said shafts, and means connected with the driving shaft for imparting to said loop-taker movements transversely of its first mentioned movements.

5. In a sewing machine, the combination with the frame comprising the bed and the overhanging bracket-arm, and a driving shaft provided with a crank and mounted longitudinally of the bed, of a reciprocating needle and a cooperating reciprocatory thread-carrying loop-taker, a carrier for said loop-taker mounted for movement both longitudinally and transversely of the bed, a needle-actuating rock-shaft mounted in and disposed longitudinally of the bracket-arm, operative connections intermediate the needle and said rock-shaft, oppositely extending balanced crank-arms upon said rock-shaft, an operative connection intermediate one of said crank-arms and the driving shaft, an angle-lever mounted upon a transverse fulcrum in the bed, a ball-pitman connection intermediate the other crank-arm of said rock-shaft and a lateral arm of said angle-lever, a ball-pitman connection intermediate an upwardly extending arm of said angle-lever and the looper-carrier, an eccentric upon the main-shaft, and a yoke connected with the looper-carrier and embracing said eccentric.

6. In a sewing machine, the combination with the frame comprising the bed and the overhanging bracket-arm, and a driving shaft provided with a crank and mounted longitudinally of the bed, of a reciprocating needle-bar carrying a needle and a cooperating reciprocatory loop-taker, a carrier for said loop-taker mounted for movement lon-

gitudinally of the bed, a needle-actuating rock-shaft mounted in and disposed longitudinally of the bracket-arm, operative connections intermediate the needle and said rock-shaft, oppositely extending crank-arms upon said rock-shaft, an operative connection intermediate one of said crank-arms and the crank of the main-shaft, an angle-lever mounted upon a transverse fulcrum in the bed, a pitman connection intermediate a second of the arms upon said rock-shaft and a lateral arm of said angle-lever, and a pitman connection intermediate an upwardly extending arm of said angle-lever and the looper-carrier.

7. In a sewing machine, the combination with the frame comprising the bed and the overhanging bracket-arm, and a driving shaft mounted in and longitudinally of the bed, of a reciprocating needle-bar, a needle carried thereby, a cooperating reciprocatory loop-taker, a carrier for said loop-taker mounted for movement longitudinally of the bed, a needle-actuating rock-shaft mounted in and disposed longitudinally of the bracket-arm and parallel with the driving shaft, operative connections intermediate the needle and said rock-shaft, a driving connection between said rock-shaft and the driving shaft, and an operative connection intermediate said rock-shaft and the loop-taker for imparting thereto its operative movements.

8. In a sewing machine, the combination with the frame, a work-plate mounted thereon, a driving shaft journaled in said frame beneath the work-plate and feeding mechanism, of a reciprocating needle, a cooperating looper, a looper-carrier, a fulcrum for said carrier supported beneath the work-plate and confined to a plane of movement in the direction of feed, a needle-actuating rock-shaft, an operative connection intermediate the needle and said rock-shaft, oppositely extending crank-arms upon said rock-shaft, an operative connection intermediate one of said crank-arms and the driving shaft, an angle-lever pivotally mounted upon the bed and formed with lateral and upright arms, a pitman connection intermediate a second of the arms upon said rock-shaft and the lateral arm of said angle-lever, and a link connection intermediate the upright arm of said angle-lever and the looper-carrier.

9. In a sewing machine, the combination with the frame comprising a bed and an overhanging bracket-arm, a work-plate mounted on the bed, and a driving shaft journaled in said frame, of a reciprocating needle and a cooperating loop-taker confined to a path of movement wholly beneath the work-plate, a needle-actuating rock-shaft mounted in and disposed longitudinally of the bracket-arm, operative connections in-

- intermediate the needle and said rock-shaft, oppositely extending crank-arms upon said rock-shaft, an operative connection intermediate one of said crank-arms and the
 5 driving shaft, and an operative connection, including a member reciprocating longitudinally in relation to said rock-shaft, intermediate the other crank-arm and the loop-taker.
- 10 10. In a sewing machine, the combination with the frame comprising a bed and an overhanging bracket-arm, and a driving shaft journaled in said frame, of a reciprocating needle and a cooperating looper, a
 15 fulcrum confined to a vertical plane transverse to said rock-shaft and upon which said looper is mounted and performs its loop-seizing movements, a needle-actuating rock-shaft mounted in and disposed longitudinally of the bracket-arm, operative connections between the needle and said rock-shaft, oppositely extending crank-arms upon
 20 said rock-shaft, an operative connection intermediate one of said crank-arms and the driving shaft, and an operative connection, including a member reciprocating longitudinally in relation to said rock-shaft, intermediate the other crank-arm and the looper.
- 25 11. In a sewing machine, the combination

with the frame comprising a bed and an
 30 overhanging bracket-arm, a work-plate, and a driving shaft journaled in said frame, of a reciprocating needle and a cooperating looper mounted for to-and-fro movement
 35 upon opposite sides of the needle-path beneath the work-plate for seizing thread-loops from and presenting thread-loops to the needle, a needle-actuating rock-shaft mounted in and disposed longitudinally of
 40 the bracket-arm, operative connections intermediate the needle and said rock-shaft, oppositely extending crank-arms upon said rock-shaft, an operative connection intermediate one of said crank-arms and the
 45 driving shaft, an operative connection, including a member reciprocating longitudinally in relation to said rock-shaft, intermediate the other crank-arm and the looper for imparting to the latter its operative
 50 loop-seizing movements, and means for imparting to the looper sidewise movements.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

WILLIAM H. HUGG.

Witnesses:

H. A. KORNEMANN, Jr.,

JOSEPH F. JAQUITH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."