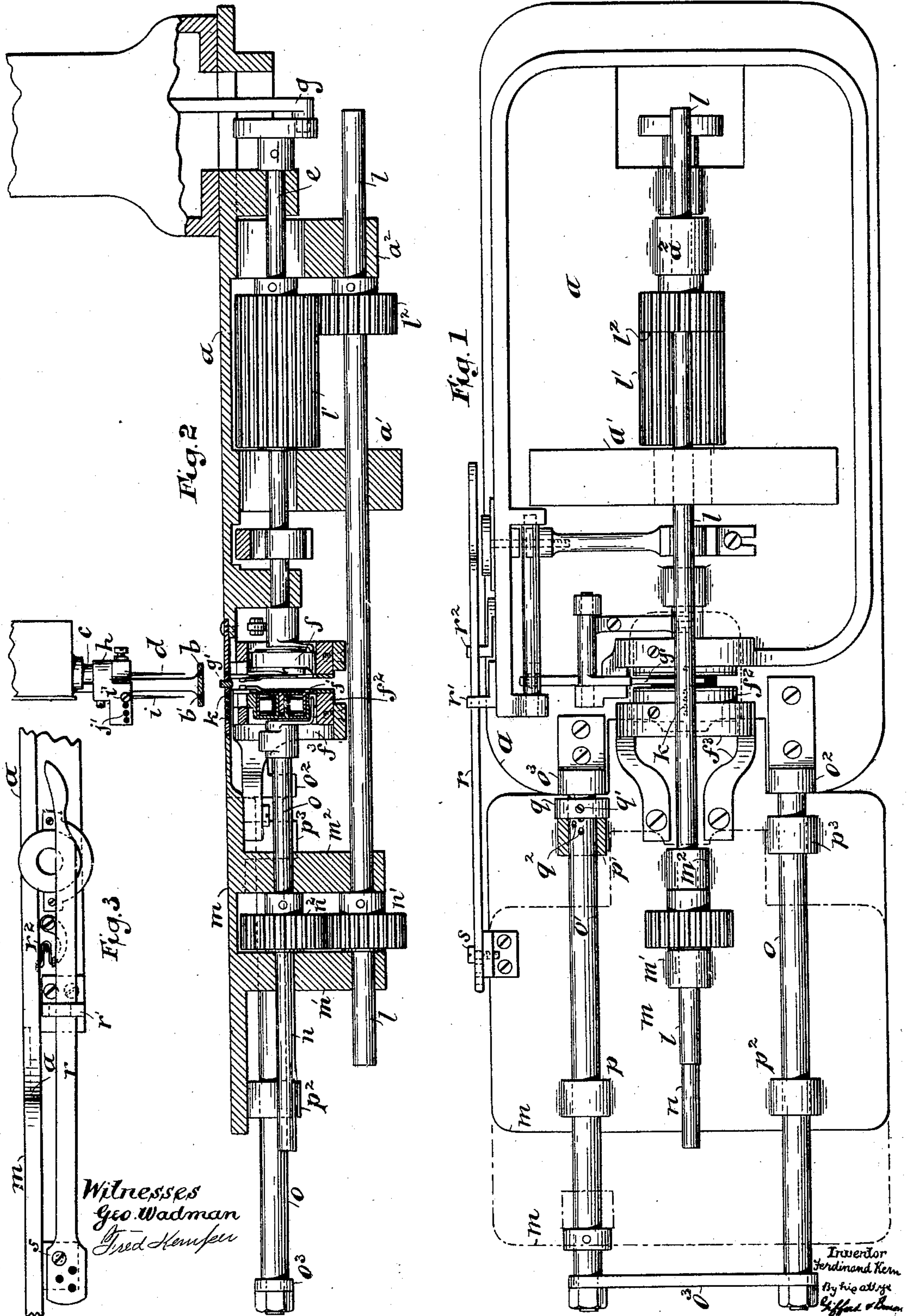


(No Model.)

F. KERN.
MULTIPLE SEWING MACHINE.

No. 411,104.

Patented Sept. 17, 1889.



UNITED STATES PATENT OFFICE.

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MULTIPLE SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 411,104, dated September 17, 1889.

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To all whom it may concern:

Be it known that I, FERDINAND KERN, of Newark, in the State of New Jersey, have invented a new and useful Improvement in Sewing-Machines, of which the following is a specification.

In Letters Patent No. 99,743, to Smith, and No. 212,783, to Applegate, are shown sewing-machines adapted for sewing two parallel seams provided with means whereby the distance between the two seams may be varied by adjustment. In the latter patent the adjustment of the shuttle is accompanied by a corresponding adjustment of the needle. In the former the adjustments of the needle and shuttle are accomplished independently. In both the machine is of a reciprocating-shuttle type. In neither is provision made for moving the adjustable shuttle farther than the position which it occupies in sewing.

The object of my improvement is to provide a sewing-machine adapted for sewing two parallel seams, and in which, without disturbing the relative position of the two needles, one of the shuttles may be moved apart from the other beyond its sewing position, and thereby enable both shuttles to be readily accessible for removal or other attention. At the same time the driving-connections between the respective shuttle-drivers remain unbroken, so that the relative timing of the parts is maintained, and the parts may be operated when the shuttles or shuttle-drivers are remote from each other in the same manner as when they are in the sewing position. I also make provision so that when the movable shuttle is returned to the sewing position it will stop and be held in the same position from which it started to correspond with the position which its needle occupies, so as to require no trial or comparison to place it in the proper position for sewing. My invention, also, is applied to a rotary-shuttle machine. The result of these features is, that unless the distance between the two seams is to be changed the needles are permanently held together by a rigid connection, which is not varied, and the position of the movable shuttle when sewing will be fixed unchangeably. This feature, combined with the fact

that a rotary and not a reciprocating shuttle is employed, gives the machine a capacity for great speed—in fact, as great as though it were sewing only a single seam. At the same time, without permanently disturbing the above feature, the operator may at any moment stop the machine and move the movable shuttle back beyond the range of the needles, and so as to give ready access to both shuttles.

Figure 1 is an inverted plan view of the bed of the machine, indicating by dotted lines the position of table *m* when moved back. Fig. 2 is a longitudinal section of the same with the upper portion of the bracket-arm omitted. Fig. 3 is a side view showing the mechanism by which the position of the added parts with respect to the balance of the machine is insured.

a is the table of the machine. *b* is the presser-foot. *c* is the needle-bar. *d* is the needle; *e*, the shuttle-shaft; *f*, the shuttle-driver, within which is held the rotating shuttle; *g*, the connecting-rod for driving the shuttle-shaft. *g'* is the feed-bar. All the foregoing parts are constructed and arranged as in the ordinary rotating-shuttle machine heretofore used.

Upon the needle-bar is clamped a piece *h*, projecting forward of the needle-bar, as shown, and supplied with provision for securing the second needle *i* at various distances from the needle *d*. In the drawings provision is made for locating the needle *i* in four positions, in either one of which it is held by the set-screw *i'* being inserted so as to clamp the needle, the several positions of the needle being indicated by the holes *j'*, provided for this set-screw. The presser-foot *b* is broadened and provided with a supplemental throat *b'*, for the passage of the needle *i*. Different presser-feet, presenting different distances between the needle-throats, are provided for each adjustment of the needle *i*. Through the table of the machine are bored the throats *k*, each one of which is vertically beneath one of the possible positions of the needle *i*.

The above describes the arrangement by which the second needle and its adjustability are provided, and it now remains to describe

the mechanism by which the second shuttle and its driving mechanism and adjustability are provided.

The shaft l is mounted in suitable bearings a' a^2 , depending from the table of the machine, and is driven by any suitable mechanism insuring the proper timing of its motions relatively to those of the shaft e —as, for instance, the gears l' and l^2 .

m is a supplemental table lying in the same plane with the table a , from which depend the arms m' and m^2 , provided with bearings for the shaft l , which projects forward, as shown.

n is a shaft mounted above the shaft l in the arms m' and m^2 , and which is driven from the shaft l by the gears n' and n^2 . This shaft n is in alignment with the shaft e , and upon the end of the shaft n , adjacent to the shuttle already referred to, is placed a second shuttle-driver and shuttle f' , facing in the opposite direction to the shuttle and shuttle-driver f , and moving in the shuttle-race f^2 , which is secured to the supplemental table m .

Now, it is evident that the shuttle f' being adjusted in the proper plane, so as to co-operate with the needle i , the operation of the machine will result in the production of two parallel seams; but it remains still to provide means whereby the shuttle-race f^2 and the shuttle f' may be moved apart from the shuttle f , so as to admit of access to the shuttles f and f' and to admit of their removal. It also remains to provide means whereby the position of the shuttle f' may be adjusted to correspond with the various positions for the needle i . It also remains to provide means whereby it will be assured that when the needle i and the shuttle f' are properly adjusted the shuttle will always be in exactly the right plane when moved up into the sewing position in which it is shown in the drawings.

Provision is made for moving the shuttle f' apart from the shuttle f by mounting the shuttle-race f^2 upon the bracket f^3 , secured to the under side of the supplemental table m , so that when the supplemental table is moved it will carry with it the shuttle-race f^2 and the parts contained therein. The rods o and o' and the cross-piece o^3 constitute a frame projecting horizontally from the table a , the ends of the rods o and o' being firmly secured in the ears o^2 and o^3 , fixed upon the under side of the table a . The supplemental table m is mounted upon the rods o and o' , to which it is secured by the ears p , p' , p^2 , and p^3 , through which the rods o and o' pass, so as to admit of a longitudinal sliding of the table m upon these rods from the position in full lines to the position in broken lines. Now, it is obvious that when this table m is slid back upon these rods some provision must be made whereby the connections by which the shaft n is driven from the main part of the machine may lengthen out to correspond with the more remote positions of the table m ; and to this end I prefer to provide for a

sliding movement of the shaft l in its bearings in the arms a' and a^2 on the main table a , and also to make the gear-wheel l' elongated, as shown, so that the gear-wheel l^2 may move longitudinally back and forth on the gear-wheel l' without being disengaged from the same. Other means might be adopted for the same purpose; but this means obviously provides for the movement of the supplemental table m , with its connected parts away from the main table a , without disengaging the driving mechanism so that the proper timing of the parts is never imperiled, as would be the case if the driving mechanism were disconnected by the movement of the supplemental table m . The connection described likewise permits the supplemental and main sewing parts to be moved in unison even when the supplemental table is slid back.

Provision is made for the adjustment of the shuttle to correspond with the various positions of the needle i , by limiting the extreme inward movement of the supplemental table m . Thus the collar q may be provided upon the rod o' , which, by means of a set-screw q' and several holes q^2 , tapped in the rod o' , may be adjusted at various distances from the ear o^3 . These holes q^2 are so arranged that when the set-screw q is in the hole nearest the main table a of the machine the shuttle f' will be in proper position to co-operate with the needle i , when the latter needle is adjusted in its nearest position to the needle d , and for each hole provided for the adjustment of the needle i farther apart from the needle d there is a corresponding hole q^2 , provided in the rod o' , so as to provide a corresponding adjustment of the shuttle f' apart from the shuttle f .

It remains still to provide for the mechanical holding of the table m in position under each adjustment of the collar q . This may be accomplished by a catch consisting of the rod r , notched so as to engage with the slotted piece r' and controlled by the spring r^2 , so that by raising the rod r , and thereby disengaging the notch in it from the piece r' , it permits of the table m being shoved back; but as soon as the table m is shoved forward the spring r^2 will insure the engagement of the notch with the piece r' . The end of this rod r , which is connected with the supplemental table m , is provided with several screw-holes corresponding in number with the holes q^2 on the rod o' , and so distanced from each other that by changing the set-screw s from one of these holes to the other the relative position between the supplemental table m and the rod r may be regulated, so that this rod has a position to engage with the piece r' upon the main table a for each adjustment of the supplemental table m , and consequently for each adjustment of the needle i and the shuttle f' . Thus the collar q performs the function for each adjustment of the needle and shuttle of pre-

venting the shuttle f^2 approaching too near the shuttle f , and the rod r for each of said adjustments prevents the shuttle f^2 from receding from the shuttle f . The parts held thus securely in position will admit of a high rate of speed.

I claim—

1. In a sewing-machine, in combination, a needle-bar, a needle affixed thereto, a second needle affixed thereto, a shuttle-driver and shuttle-race, and means for supporting the same, whereby they are maintained in a fixed position, so that the shuttle controlled thereby shall co-operate with the first needle, a second shuttle-driver and shuttle-race, a carriage, upon which the same are mounted, said carriage having a range of movement to carry the shuttle-driver and shuttle-race from a position to sew in co-operation with the second needle into a position beyond the range of adjustment of the needle without disturbing the fixed position of the needle upon the needle-bar, and connections whereby the first and second shuttle-drivers are actuated from the same prime mover, substantially as described.

2. In a sewing-machine, in combination, a needle-bar, a needle affixed thereto, a second needle affixed thereto, means whereby the second needle may be affixed thereto at varying distances from the first needle, a shuttle-race fixed upon the frame of the machine in such a position that the shuttle contained therein would co-operate with the first needle, a shuttle-driver for operating said shuttle, a second shuttle-race and shuttle-driver, a carriage upon which the same are mounted, said carriage having a range of movement sufficient to move the shuttle-driver and shuttle-race from position to sew with said second needle into a position beyond the range of adjustment of the needle, means of adjustment whereby the position of said second shuttle-race and shuttle-driver may be adjusted upon said carriage, so that the shuttle belonging thereto may be located to correspond with the position of said second needle upon the needle-bar, and means for actuating said first and second shuttle-drivers from the same prime mover, substantially as described.

3. In a sewing-machine, in combination, two needles, two rotary shuttle-drivers, a shuttle-race for each, said rotary shuttle-drivers being mounted face to face upon the ends of two shafts in alignment with each other, connec-

tions whereby one of said shafts and one of said shuttle-races is secured in a fixed position upon the frame of the machine, a carriage upon which the second shaft and shuttle-race are secured, a shaft l , extending from the driving mechanism of the first shuttle-driver and in proximity with said second shaft, and mechanical connections whereby said second shaft may be driven for all positions of the carriage, substantially as described.

4. In a sewing-machine, in combination, two needles, a shuttle-race and shuttle-driver arranged to drive a shuttle to co-operate with the first-named needle, a shuttle-race and shuttle-driver arranged to drive a shuttle to co-operate with the second needle, a carriage upon which said second shuttle-race and shuttle-driver are mounted and adapted to move the same from a position to sew with the second needle into a position remote therefrom, a stop whereby the inward motion of said carriage is arrested in such position as to locate the second shuttle properly to sew with the said second needle, a latch whereby said carriage is held against said stop, and connecting mechanism whereby said first and second shuttle-drivers are actuated from the same driving mechanism, substantially as described.

5. In a sewing-machine, in combination, two needles, a shuttle-race and shuttle-driver adapted to drive a shuttle to co-operate with the first needle, a shuttle-race and shuttle-driver adapted to drive a shuttle to co-operate with the second needle, a carriage upon which said second shuttle-race and shuttle-driver are mounted and adapted to carry the same from a position to sew with the said second needle to a position remote therefrom, a stop whereby the inward motion of said carriage is arrested to present the said second shuttle in proper position to sew with the said second needle, a latch whereby said carriage is held against said stop, means of adjustment for said stop, said latch, and said second needle, whereby the distance between the two seams may be varied, and connecting mechanism whereby said first and second shuttle-drivers are actuated from the same prime mover, substantially as described.

FERDINAND KERN.

Witnesses:

S. O. EDMONDS,
FRED KEMPER.