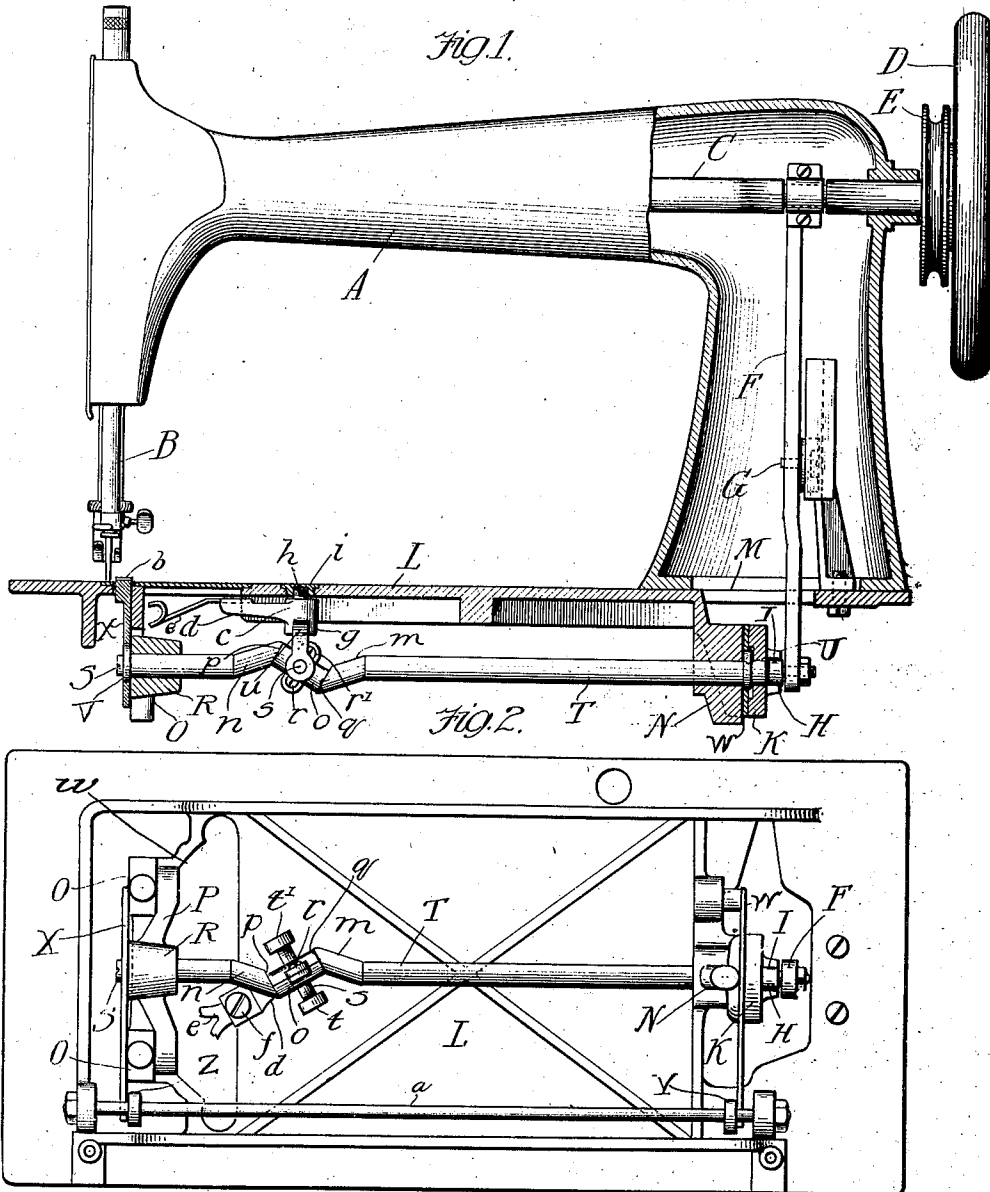


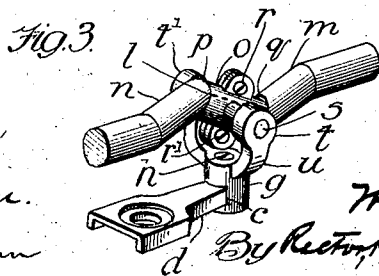
W. C. FREE.
SEWING MACHINE.
APPLICATION FILED APR. 16, 1912.

1,062,389.

Patented May 20, 1913.



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SEWING-MACHINE.

1,062,389.

Specification of Letters Patent.

Patented May 20, 1913.

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To all whom it may concern:

Be it known that I, WILLIAM C. FREE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Sewing-Machines, of which the following is a specification.

My invention relates more particularly to a mechanism for driving the shuttle and carrier of an oscillating shuttle sewing machine. In order to reduce the noise and the effort necessary to run machines of this type it is recognized that the number and movement of inertia of the oscillating parts should be reduced to a minimum. In certain patents heretofore granted to me of which that numbered 830,059 and granted September 4, 1906 is an example, I have disclosed a shuttle motion in which all but one of the parts are rotary, the exception being the oscillating head upon which the shuttle carrier and shuttle are mounted. This head, in addition to the arm carrying the shuttle carrier, comprises a yoke in which a gimbal ring is pivoted, which latter co-operates with a cam face on the lower shaft, through which movement is communicated to the oscillating head in a manner that will be apparent from an inspection of the drawing of the patent. The construction of this device, however, is such that careful adjustment and alinement of the parts are necessary, which not only increases the original cost of the machine but adds to the expense of keeping it in repair.

My present invention may be said to be an improvement upon the shuttle mechanism of my former patents and of the prior art, especially in that the weight of the oscillating parts is greatly reduced and the accuracy of adjustment required in the former mechanism is obviated.

In the device of the present application the oscillating head carrying the shuttle is not mounted on the head plate of the machine as in the mechanism heretofore described, though it is pivotally connected thereto, or more accurately speaking, guided thereon, but with some freedom of axial adjustment on its pivot. It is suspended from or supported on the shaft with which it is connected by a sleeve mounted upon an inclined portion thereof, the sleeve being in turn pivoted or trunnioned in a yoke formed upon the oscillating head. A certain

amount of axial adjustment is also permitted between the trunnions of the sleeve and the yoke upon the oscillating head, and by reason of this freedom of movement with respect both to the pivot upon the head plate, and the trunnions upon the sleeve, the oscillating head may be said to float or be suspended from the lower shaft. No accurate adjustment and alinement of the parts is therefore necessary to secure easy running qualities in the machine and as a result the machine is not only easier to assemble and cheaper to construct, but the size of the bearings and parts can be and is reduced to a minimum.

An embodiment of my invention is shown in the accompanying drawings and specifically described in the following specification, but it is to be understood that the specific disclosure is for the purpose of exemplification only and that my invention is not limited thereto but its scope is defined in the following claims.

In the drawings Figure 1 is a vertical elevation partly in section of a sewing machine head embodying my invention; Fig. 2 is a bottom plan view of the same and Fig. 3 is a detail in perspective upon a slightly enlarged scale.

The stationary arm A, needle bar B, upper shaft C, hand wheel D, pulley E and lever F may be and as shown are, of usual construction, the latter element having a sliding fulcrum G and a roller H which operates in a radial way I formed between two lugs of a disk K upon the rear end of the lower shaft. By reason of the fact that all these parts are of known construction and do not specifically enter into my invention, it is unnecessary to describe them further. The head plate L is perforated at M for the passage of the lever F and is formed with a bracket N which forms a bearing for the lower shaft. At its forward end the head plate is formed with a pair of downwardly projecting posts O, upon which is mounted and secured a bridge piece P, having a perforated central boss R which forms a bearing for the forward end of the lower shaft. The lower shaft T is provided, intermediate the disk K and the rear bearing, with a cam U and at its forward end just outside the bearing R with an additional cam V, the two cams being embraced or spanned respectively by the forms

of bifurcated levers W, X, each of which connects at one end with an arm Y, Z the rock shaft *a*. The latter lever carries the cloth feed plate *b* and receives a reciprocating horizontal motion from the rock shaft *a* and a vertical motion from the cam V on the front of the lower shaft. This feed-mechanism is of a substantially familiar form to those skilled in the art and forms no part of my present invention and need therefore not be further described. The oscillating head *c* is pivoted to the under face of the sewing machine head plate L and is formed with an integral arm *d*, to which the shuttle carrier *e* is secured by a screw *f*. The oscillating head comprises, in addition to the arm *d* before referred to, a hub *g* which is centrally bored to receive a stud or post *h* extending downwardly from the head *i* tapped through the sewing machine head plate L from the upper side. The stud *h*, however, is cylindrical throughout that portion thereof which projects below the head plate so that the oscillating head *c* is permitted not only a movement of rotation with reference to the stud or pin, but also a slight axial movement thereon. The stud *h* is mounted in the machine head plate directly above the center of the lower shaft T and the latter is formed in line with the stud with a reduced inclined portion *l*, indicated in dotted lines in Fig. 3, connected at opposite ends to the end sections of the shaft by the crank arms *m*, *n*. The center of the inclined portion of the shaft is substantially in the axis of the stud *h* and the hub *g* of the oscillating head and the inclined reduced portion of the shaft forms a bearing for a sleeve *o* fitted between the shoulders *p* and *q* upon the crank arms. For convenience of assembling this sleeve is formed in two sections secured together by screws *r*, *r'*, and each section bears a trunnion *s*, the pair of trunnions being in alignment and received within bearing eyes *t*, *t'*, formed in the branches of a yoke *u* extending upwardly from and integral with the hub of the oscillating head. The trunnions are perpendicular to the inclined portion of the shaft and are permitted slight axial movement with relation to their bearings. This axial play together with the axial play between the oscillating head and the stud on which it is pivoted, permits a substantially universal adjustment between the parts and therefore accurate placement and alining of the various elements are not necessary as in my former device. Furthermore, I am here enabled to dispense with any large bearing surfaces or bearings, the stud *h* on the head plate acting substantially only as a guide or journal to hold the head to a pivotal oscillating movement. The weight of the parts, and especially of such as have an oscillating motion has been

greatly reduced and the whole construction simplified as compared to the devices of the prior art.

It will be apparent from what has been said that when rotary motion is given the lower shaft by the familiar mechanism heretofore referred to, the sleeve upon the inclined portion of the shaft is given a wobbling motion about the intersection of the axes of its trunnions and the shaft, and the trunnions oscillate back and forth in a horizontal plane and impart a swinging motion to the oscillating head and shuttle carrier, so that the shuttle is fed back and forth along the shuttle race *w*.

In the foregoing specification I have referred to the shaft T as rotary and ordinarily as in the particular device described the shaft will be given a continuous rotation in one direction. It will be obvious, however, that the shaft might be given rotation in alternate directions, or in other words oscillation without departing from the scope of my invention.

I claim:

1. In a sewing machine, a shuttle mechanism comprising a rotary shaft, an inclined bearing thereon, a member journaled on the bearing and an oscillating shuttle-carrier pivotally connected to said member.

2. In a sewing machine, a shuttle mechanism comprising a rotary shaft, an inclined bearing thereon, a member mounted on the bearing, an oscillating head pivoted to and supported by said member and a vertical arbor about which said shuttle carrier oscillates.

3. In a sewing machine, a shuttle operating mechanism comprising a rotary shaft having an inclined bearing, a member sleeved upon the bearing, a shuttle-carrier pivotally connected to the sewing machine head plate on an axis transverse to the shaft and pivotal connection between the sleeved member and said shuttle carrier.

4. In a shuttle operating mechanism, a shaft having a bearing thereon inclined to the axis of the shaft, a sleeve on the bearing, an oscillating head carrying a shuttle carrier and pivoted on the head plate on an axis transverse to the shaft and a pivotal connection between the sleeved member and the oscillating head, the axis of the connection being transverse to the bearing on the shaft and also to the axis on which the oscillating head is pivoted.

5. In a shuttle operating mechanism for a sewing machine, an oscillating head pivotally guided upon the head plate of the machine and having capacity for axial movement with relation to its pivot, a rotary shaft arranged substantially at right angles to the axis of the oscillating head, an inclined bearing on the shaft, a member sleeved upon the bearing and pivoted to the oscillating

head, there being provision for axial movement on the pivot between the sleeved member and the oscillating head.

5 6. In a shuttle operating mechanism for a sewing machine, a rotary shaft having an inclined bearing thereon, a sleeve on the bearing having transverse trunnions, an oscillating head with a shuttle-carrier mounted thereon, said head pivoted on the sewing
10 machine head plate and formed with a yoke and bearings on the yoke engaging the trunnions on the sleeve.

7. In a shuttle operating mechanism for sewing machines, a rotary shaft having an
15 inclined bearing, a member sleeved upon said bearing, an oscillating head carrying the shuttle carrier and having vertical pivotal connection with the sewing machine

head plate and pivoted to the sleeve in an axis transverse thereof.

8. In a shuttle operating mechanism for a sewing machine, a rotary shaft having an inclined bearing portion, an oscillating head having the shuttle-carrier mounted thereon and pivoted to the head plate transversely
25 of the rotary shaft, a yoke formed upon the oscillating head and having bearings at the ends of the arms thereof, a split sleeve mounted upon the inclined bearing on the shaft and having trunnions engaging the
30 bearings of the yoke.

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