2 Sheets—Sheet 1.

S. M. STEWART.

SHUTTLE-DRIVING MECHANISM FOR SEWING-MACHINES.

No. 192,137. Patented June 19, 1877.

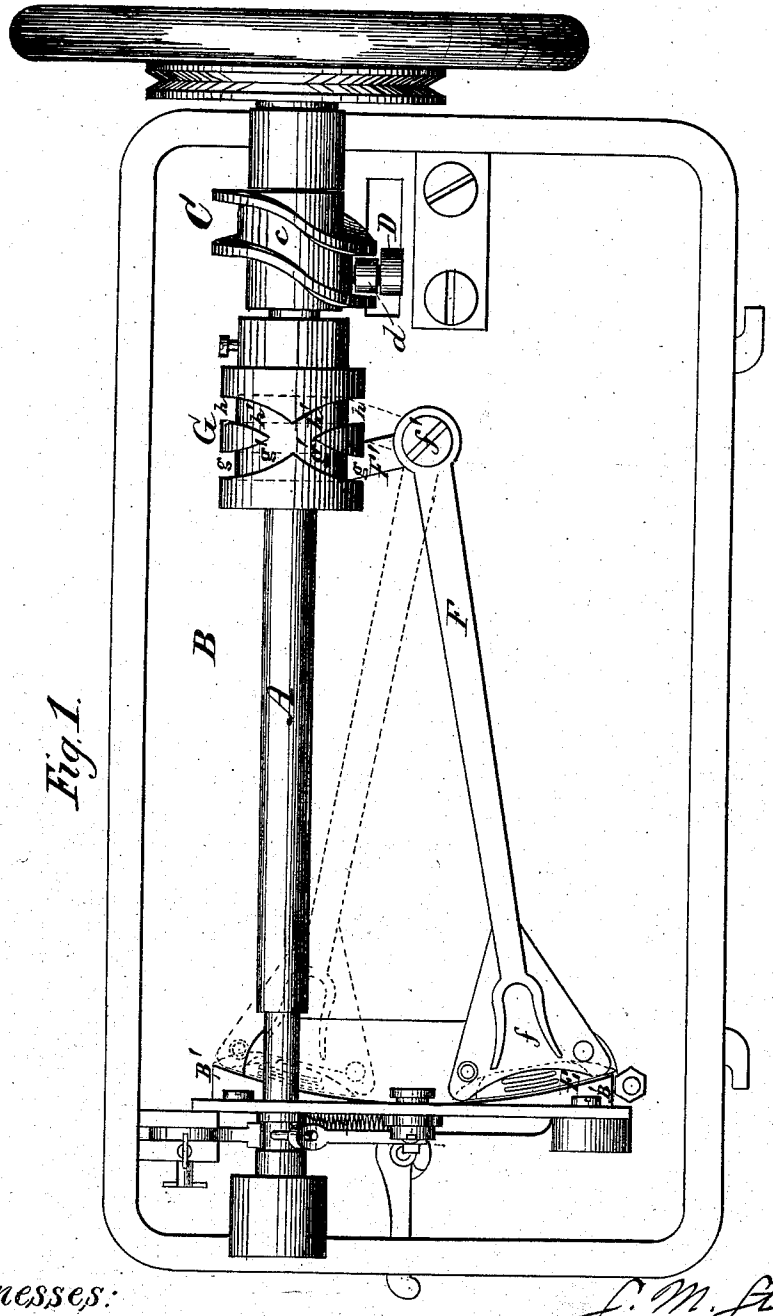

Fig. 1.

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2 Sheets—Sheet 2.

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Fig. 2.

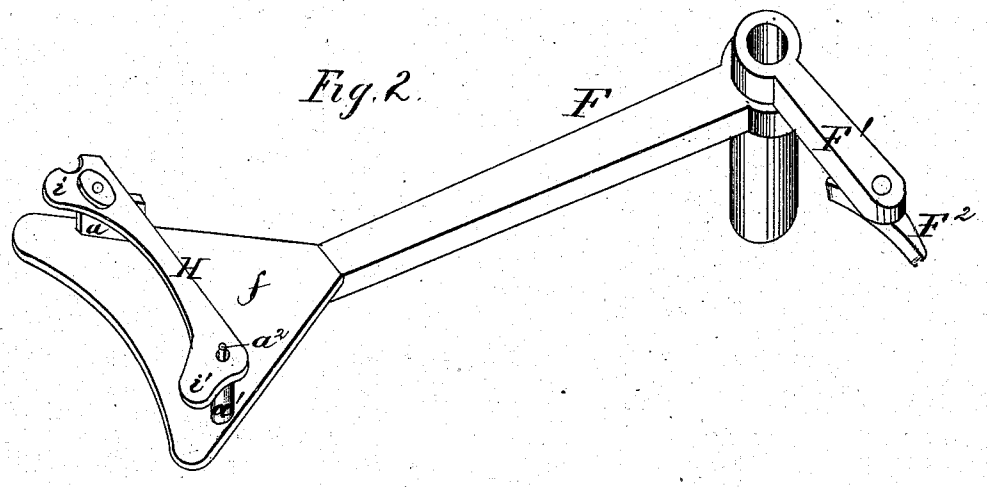


Fig. 3

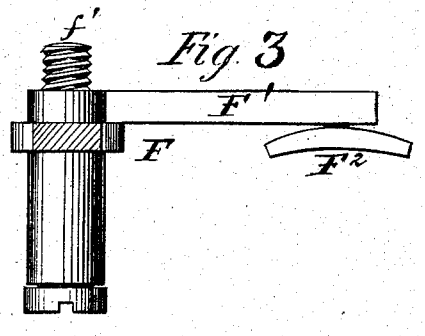
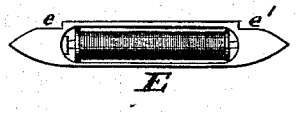


Fig 4



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UNITED STATES PATENT OFFICE.

SAMUEL M. STEWART, OF NEW HARRISBURG, ASSIGNOR OF ONE-HALF OF HIS RIGHT TO JEREMIAH M. PERDUE AND WILLIAM F. FAAS, BOTH OF MINERVA, OHIO.

IMPROVEMENT IN SHUTTLE-DRIVING MECHANISMS FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. **192,137**, dated June 19, 1877; application filed December 4, 1876.

To all whom it may concern:

Be it known that I, SAMUEL M. STEWART, of New Harrisburg, in the county of Carroll and State of Ohio, have invented a certain Improvement in Shuttle-Driving Mechanisms for Sewing-Machines, of which the following is a specification:

This invention relates to that class of shuttle sewing-machines operating with a double-pointed shuttle, the movements of which with reference to the needle are so timed that it will pass through two successive loops of the needle-thread in shooting it once back and forth.

The object of my improvement is to equalize the power required to drive the machine by an organization of mechanism which will move the needle up and down while the shuttle remains inactive, and then shoot the shuttle in one direction during the time of rest of the needle.

The principal elements used to accomplish said objects are a cam on the driving-shaft for imparting an up-and-down motion to the needle-arm during each revolution of said shaft, and maintaining it at rest during the time, or nearly so, that the shuttle is shot through the loop of the needle-thread; a lever for carrying the double-pointed shuttle; a cam on the driving-shaft, so constructed and so combined with said lever that the shuttle will be moved forward at one interval of rest of the needle and back at its next interval of rest.

The combinations which I claim as my invention are clearly pointed out by the claims at the close of this specification.

In the annexed drawings, Figure 1 is a bottom view of a sewing-machine embodying my invention. Fig. 2 is a perspective view of the shuttle-carrying lever. Figs. 3 and 4 are detail views, hereinafter more specifically referred to.

The same letters of reference are used in all the figures in the designation of identical parts.

The driving-shaft A, mounted in suitable bearings under the base-plate B of the machine, carries, near one end, the cam C, in the groove *c* of which an anti-friction roller, *d*, on a stud of the short member D of the needle-arm plays, as shown in Fig. 1.

The cam-groove *c* is of such a nature that during a portion of the rotation of the cam it will oscillate the needle-arm so as to move the needle once up and down, and then hold the needle-arm stationary while the cam completes its rotation.

The double-pointed shuttle E is supported upon a plate, *f*, on the extreme end of the long arm of an L-lever, F, which is pivoted at *f'* to the base-plate of the machine, and whose short arm F^1 overhangs the cam G on the driving-shaft. A swiveling guide, F^2, pivoted to the end of the short arm of the shuttle-carrying lever, engages the cam G, which, has in its surface two grooves, *g* and *h*, which, for the major part, extend annularly and parallelly around the body of the cam, but have oblique terminations *g'* and *h'*, which intersect one another, as clearly shown in Fig. 1. The swiveling guide F^2 plays in these cam-grooves, the oblique terminations of which divert it once during each rotation of the cam from one annular groove into the other, whereby the shuttle-carrying lever will be swung and the shuttle passed across the path of the needle through the loop of its thread. After the shuttle has been carried through the loop by the lever the latter comes to a standstill, and remains at rest while the needle makes an up-and-down stroke, after which the guide F^2 is again diverted into the other annular groove of cam G, whereby the shuttle is returned to its first position, again passing through a loop of the needle-thread, and this operation continues. The respective actions of the cams C and G are so timed that the movements of the needle and the shuttle will be successive, at least practically so, and not simultaneous.

By this arrangement the power required to operate the machine will be about equal through the entire rotation of the driving-shaft. In consequence the machine will run very evenly and smoothly, and the power required to drive it is reduced to a minimum.

The rear side of the double-pointed shuttle bears against studs or projections *a* and a^1 on the plate *f* of lever F, while its front side bears

against the segmental side of the bar B′ on the bottom of the base-plate. As usual, an opening is formed in the base-plate, through which the shuttle can be reached from above and removed, the opening being covered by a slide.

In operating the machine this covering-slide is sometimes drawn out accidentally, exposing the shuttle. Now, to prevent the shuttle at such times from jumping off its plate, I provide a latch, H, the fingers *i* and *i′* of which overhang the cut-away portions *e* and *e′* (see Fig. 4) of the shuttle, leaving the required clearance for the thread. The latch is pivoted to the stud *a*, and its other end being perforated receives the projecting end of the spring-catch piece a^2.

The swiveling guide F^2 is of sufficient length to insure its switching with certainty from one annular groove into the other. To further facilitate this action, it is somewhat pointed at its ends and slightly curved.

I am aware that a double-grooved cam has heretofore been used, in connection with a shuttle-carrying lever, to move the shuttle with reference to the movements of the needle, substantially in the manner herein set forth; but the shuttle-carrying lever was a straight one, in consequence of which the driving-shaft carrying said cam had to be arranged in a way necessitating a peculiar mechanism for driving the needle-arm. By the use of an L-shaped or elbow lever for the shuttle-carrier I am enabled to simplify the mechanism, and the whole arrangement is much better adapted to the modern style of sewing-machines.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, substantially as specified, of the needle-arm, the cam for driving it, the L-shaped shuttle-carrying lever, and the double-grooved cam for driving it, the said cams being timed for operating relatively, as set forth.

2. The combination, substantially as specified, of the double-pointed shuttle, the L-shaped lever carrying it, and the double-grooved cam for driving said lever.

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

SAMUEL M. STEWART.

Witnesses:
JOHN S. TOMLINSON,
JOHN BRISDENSTUN.