

(No Model.)

F. R. SMITH.
SEWING MACHINE.

No. 255,544.

Patented Mar. 28, 1882.

Fig. 1.

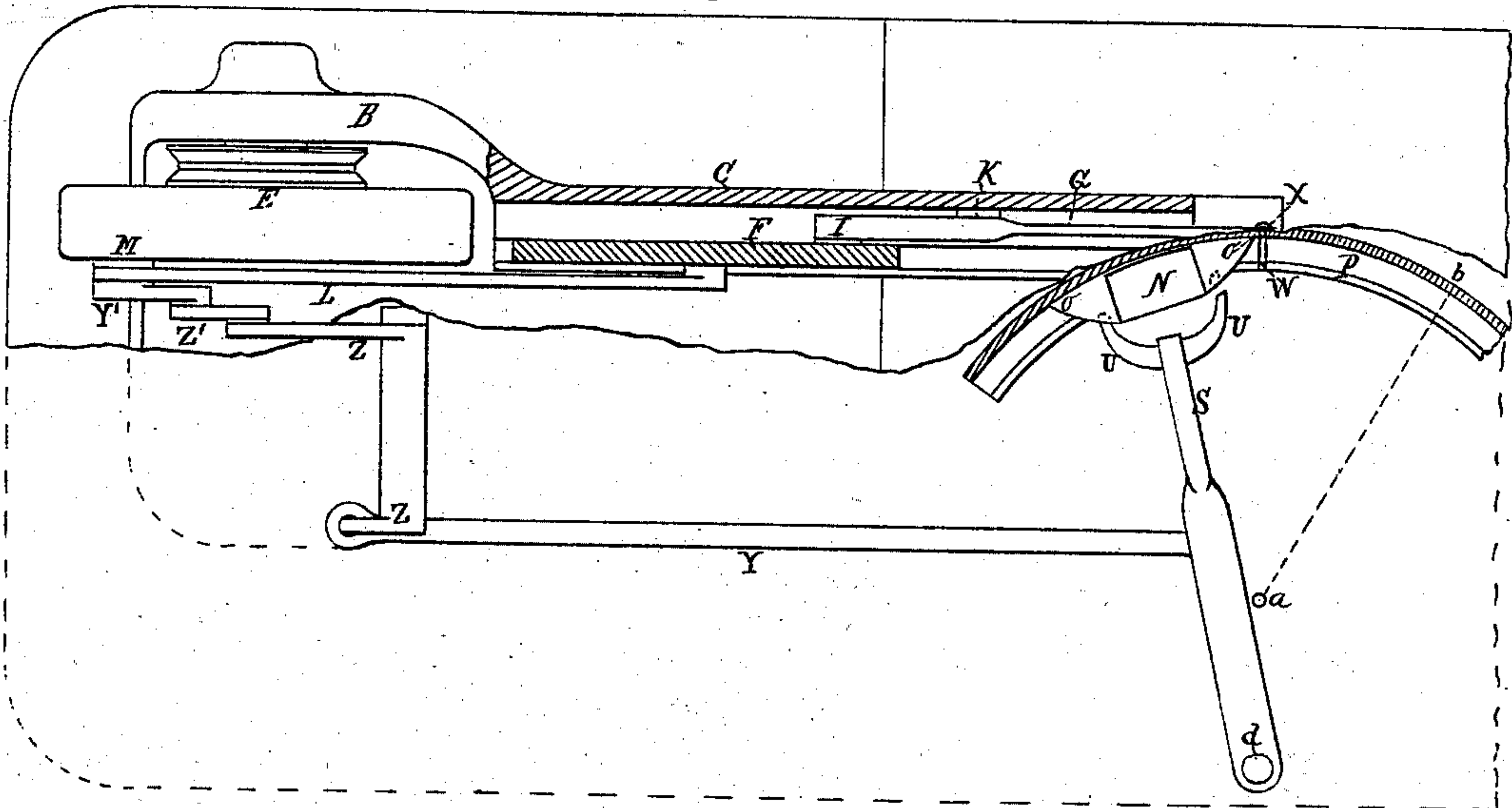


Fig. 3.

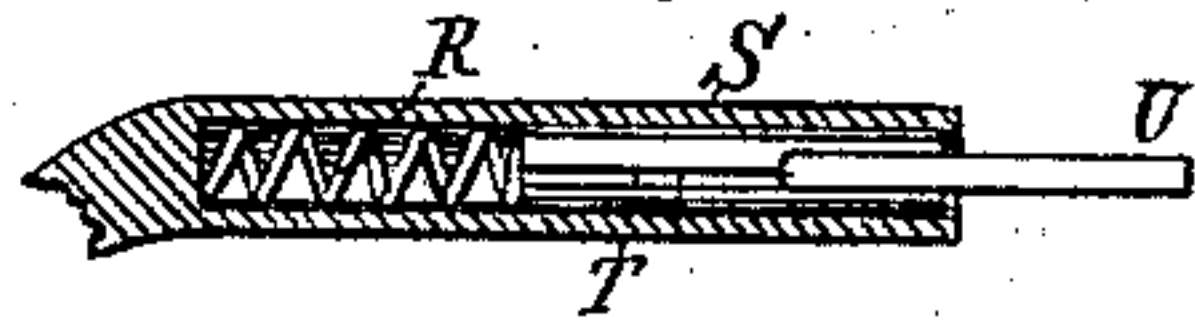
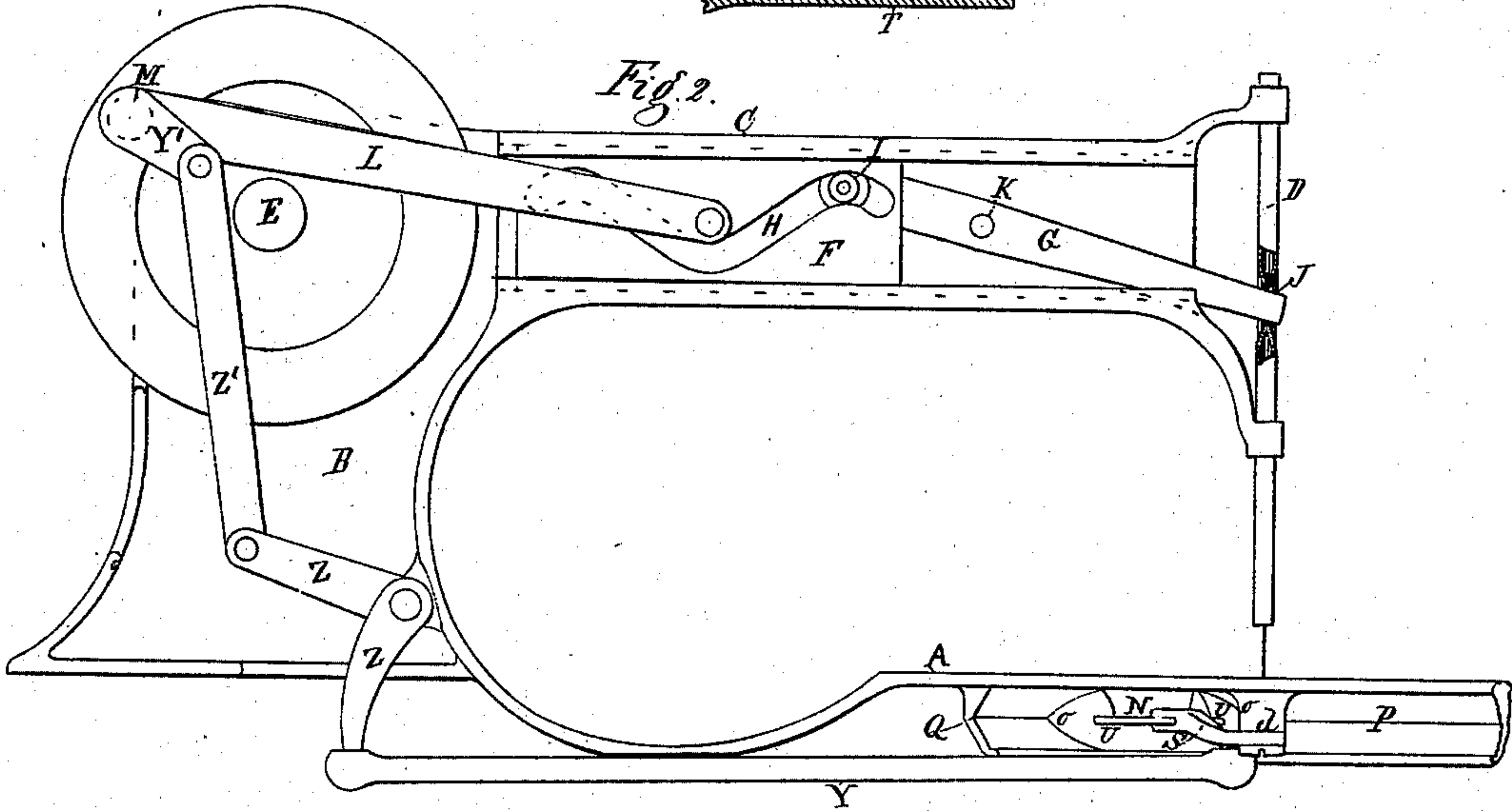


Fig. 2.



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UNITED STATES PATENT OFFICE.

FRANKLIN R. SMITH, OF SYRACUSE, NEW YORK, ASSIGNOR OF TWO-THIRDS
TO WILLIS S. BARNUM, OF SAME PLACE, AND IRA W. DANIELS, OF ILION,
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SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 255,544, dated March 23, 1892.

Application filed November 3, 1881. (No model.)

To all whom it may concern:

Be it known that I, FRANKLIN R. SMITH, of Syracuse, Onondaga county, New York, have invented a new and useful Improvement in Sewing-Machines, of which the following is a specification.

My invention consists of a novel contrivance of the shuttle-driver, being an extensible horned and spring arrangement of the same, and a larger radius thereof than that of the shuttle, for opening and closing the connections of the driver with the shuttle to pass the thread, and for keeping the shuttle pressed in its groove or race to prevent rattling.

My invention also consists of a duplex cam mechanism of novel construction for operating the needle-bar two strokes to one revolution of the driving-shaft, all as hereinafter described, reference being had to the accompanying drawings, in which—

Figure 1 represents my improvements partly in horizontal section and partly in plan view, with a portion of the table broken out. Fig. 2 is a side elevation with a portion of the needle-bar sectioned, and Fig. 3 is a sectional detail of a portion of the shuttle-driving mechanism.

A represents the table or bed-plate of the machine, whereon is the usual standard, B, for support of the stationary arm C, in the end of which the needle-bar D is mounted, and also carrying the driving-shaft E.

F is a reciprocating cam-plate fixed in a race in the side of said stationary arm C for operating the needle-bar by means of the lever G, which it operates by means of its groove H, in which a roller, I, works, which is mounted on a stud-pin of the short arm of said lever, the other arm of which enters by preference a slot in the needle-bar at J, while it vibrates on the fulcrum stud K. The cam-plate F is reciprocated by the crank-shaft E, to which it is connected by rod L and crank-pin M.

It will be noted that the cam-groove H is of duplex form, and thereby produces two double strokes of the needle-bar to one revolution of the driving-shaft.

N represents the shuttle, having each end pointed for passing through the needle-thread

loop alike from either direction alternately. It runs in the circular race P, having the V-shaped side Q, against which the shuttle bears, and being constructed on the radius $a b$. The shuttle, having the suitable reverse Λ shape corresponding to the V of the race, is pressed into the latter by the spring R in the hollow end of the driver S bearing against the shank T of the horns U, which alternately engage and release the shuttle, according as the driver S passes to one side or the other of the axis a of the shuttle-race, the said arm working on the larger radius of axis d for that purpose, the object of which is to open passages for the loops between the horns and the shuttle.

The slot W is made across the shuttle-race from the needle-hole X to allow the loop to draw around the shuttle, and the walls of said slot serve to prevent the loop from turning either way along the shuttle-race before being entered by the points of the shuttle, and thereby escaping from them. The shuttle-driver S is worked by the crank-shaft E, to which it is connected by the rod Y, bell-crank Z, rod Z', arm Y', and wrist M, and works synchronously therewith, while the needle-bar works twice as fast.

Any approved arrangement of connecting devices for working the shuttle-driver may be employed instead of the one here shown; and I do not limit myself to the reciprocating-cam arrangement for working and multiplying the speed of the needle-bar. The arm G for working the needle-bar may be connected to it by a link instead of by the slot, as here shown, if preferred.

The hollow or tubular construction of the needle-bar is shown in the section at the slot J, where the lever G engages it. In this case portions of the opposite sides of the bar are bent inward to a point for contact with the lever; but it may be preferred in practice to fill the space between said sides with short pieces of hardened steel, glass, or other durable material for wearing-points, said points being suitably oval in the form of the ends against which the lever works for wear and for working firmly.

Having thus described my invention, what

I claim, and desire to secure by Letters Patent, is—

1. The shuttle-race having angular or V-shaped face and the shuttle having the reverse form, and being pressed therein by an extensible spring-pressed horned arm of the shuttle-driver, substantially as described.

2. The shuttle-driver S, having extensible spring-pressed horns U, and being arranged on a larger radius than that of the shuttle-race, substantially as described.

3. The combination, with a shuttle passing through a loop each way of its traverse, of the

horned driver S U, arranged on a larger radius than that of the shuttle-race, substantially as described.

4. The combination of the reciprocating plate F, having a duplex cam-groove, as described, lever G, and connecting-rod L, with the driving-shaft and needle-bar of a sewing-machine, substantially as described.

FRANKLIN R. SMITH.

Witnesses:

W. J. MORGAN,
S. H. MORGAN.