

(No Model.)

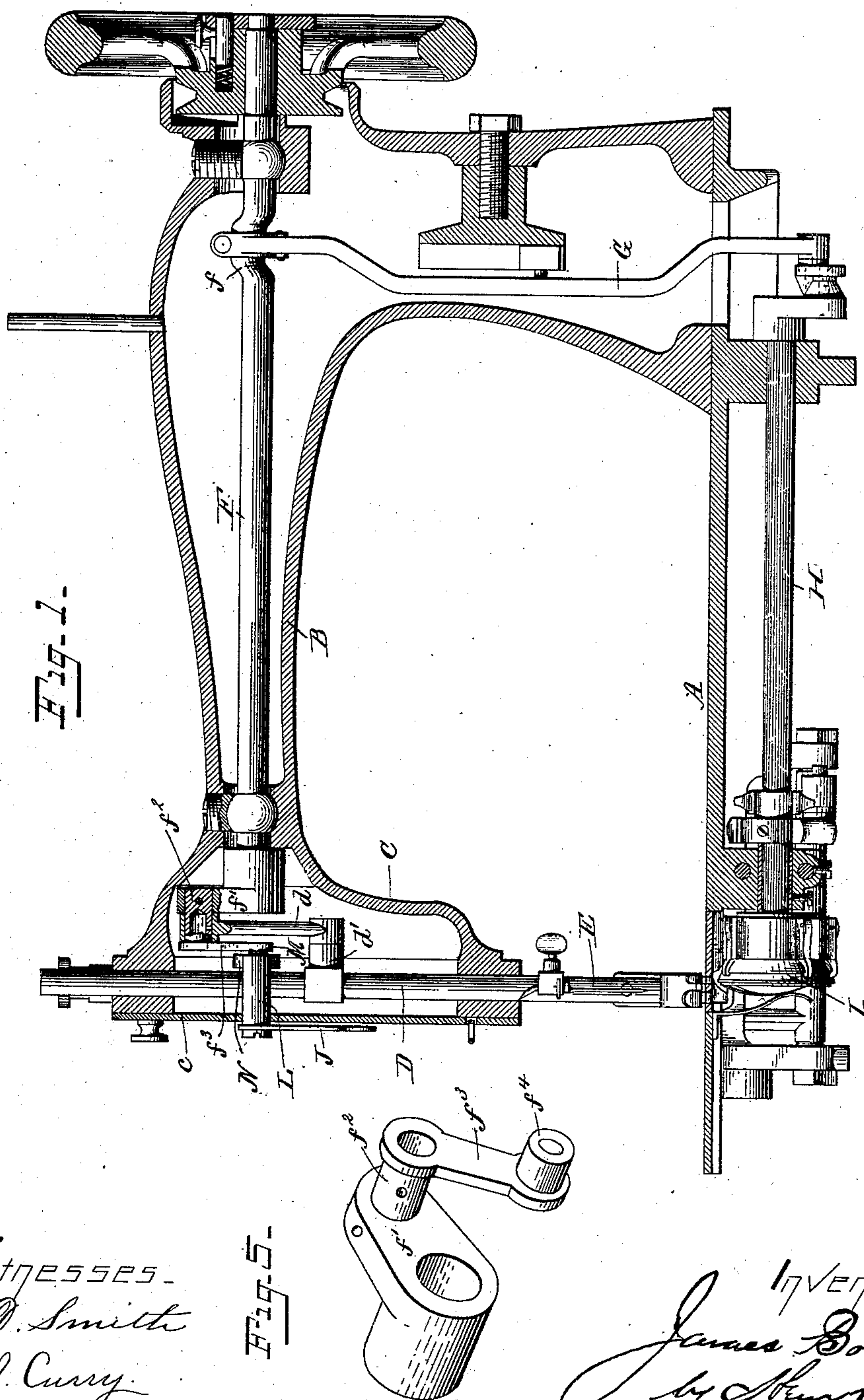
2 Sheets—Sheet 1.

J. BOLTON.

TAKE-UP FOR SEWING MACHINES.

No. 389,788.

Patented Sept. 18, 1888.



Witnesses.
E. D. Smith
H. I. Curry.

Inventor-
James Bolton
by Henry Calver
Att'y

(No Model.)

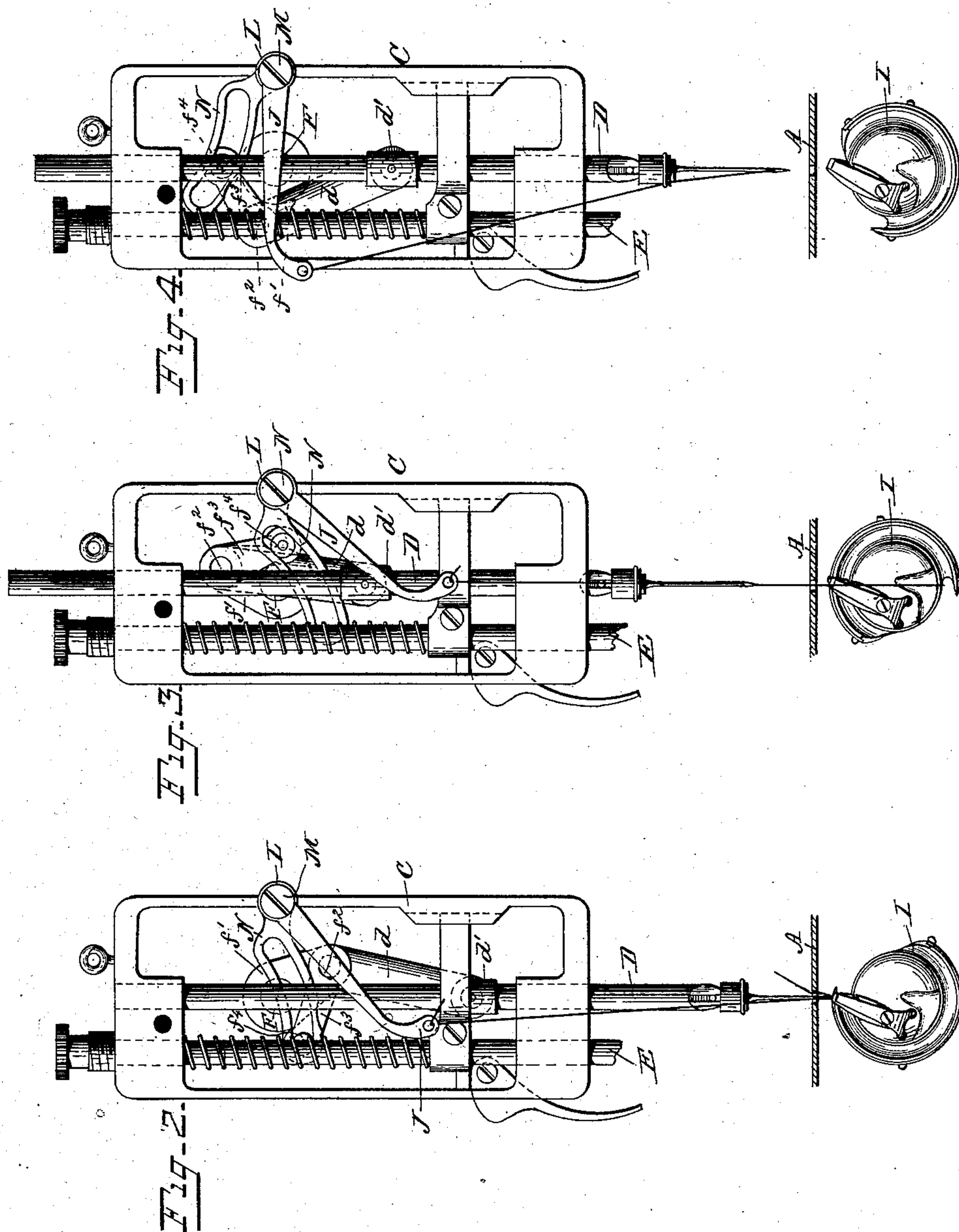
2 Sheets—Sheet 2.

J. BOLTON.

TAKE-UP FOR SEWING MACHINES.

No. 389,788.

Patented Sept. 18, 1888.



Witnesses—
E. D. Smith
H. I. Curry

Inventor—
James Bolton
by *King & Co.*

UNITED STATES PATENT OFFICE.

JAMES BOLTON, OF NEW YORK, N. Y.

TAKE-UP FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 389,788, dated September 18, 1888.

Application filed December 8, 1887. Serial No. 257,322. (No model.)

To all whom it may concern:

Be it known that I, JAMES BOLTON, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Take-Ups for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 The object of my invention is to provide a positive and silently-operating take-up mechanism for sewing-machines, and one which is more particularly adapted for that class of sewing-machines having rotary shuttles. Machines of this class require a large amount of slack needle-thread to make loops of sufficient size for the shuttles to pass through, and as it is necessary in the successful operation of such machines to take up these large loops and
20 tighten the stitches during the time occupied by the shuttle in making about a quarter-revolution, or between the time when a loop of needle-thread will have been carried more than half-way round the shuttle and the time when
25 the eye of the needle will have entered the work for the formation of the next stitch, it has been a somewhat difficult problem to provide a take-up mechanism to meet this requirement, and which will still have a smooth,
30 steady, silent, and positive action. My improved take-up mechanism, however, meets this desideratum, and although specially designed for the rotating-shuttle machines it may also be advantageously employed in revolving-hook machines, as also in vibrating or oscillating shuttle machines.

In carrying my invention into effect I provide the needle-bar-operating crank with an extension forming a second crank, the crank-pin of which is about ninety degrees of a circle from or behind the needle-bar-operating crank-pin. The take-up arm, which extends outside or in front of the face-plate of the machine, is carried by a small rock-shaft pivoted
45 to one side of the "head" at the forward end of the bracket-arm, and preferably having its center in the horizontal plane of the center of the driving-shaft. The said rock-shaft has a slotted operating-arm extending within the
50 head, and within the slot of the said arm, to operate the same, works the pin of the second

crank, above referred to. Thus the needle-bar and take-up are operated by what may be termed a "double crank," and as the take-up rock-shaft is at one side of the head the take-up crank-pin will be close to the center of motion of the take-up arm at the time when a stitch is to be tightened, so that only a comparatively short distance need be traversed by the said crank-pin to give a sufficient throw to the take-up arm to draw up the loop. Thus the first part of the take-up movement will be very rapid; but as the operation of tightening the stitch is approaching completion the take-up crank-pin will be receding from the take-up rock-shaft in the slotted operating arm of the latter, and as the leverage of the said pin on the said arm will therefore gradually increase the movement of the take-up arm will correspondingly decrease as the stitch is being tightened, the take-up arm coming to a full stop before beginning its return movement, just as the stitch is fully drawn up into the work. There will therefore be no sudden jerk on the thread when the strain comes, and there will consequently be little danger of breaking the thread in the rapid operation of the take-up.

In the drawings, Figure 1 is a sectional side view of a sewing-machine embodying my invention. Figs. 2, 3, and 4 are front views of the head of the machine, showing the parts in different positions, these views also showing the positions of the needle and shuttle corresponding to the different positions of the take-up. Fig. 5 is a detail perspective view of the double crank for operating the needle-bar and take-up.

A denotes the work-plate of the machine, and B the bracket-arm thereof, the latter being provided at its forward end with the usual depending head, C, in which the needle-bar D and presser-bar E have their bearings. F is the driving-shaft, having the crank *f*, connected by the pitman-lever G with the rotating shaft H, beneath the work-plate, the said shaft H carrying at its forward end the rotating shuttle I. The said shuttle is carried by clamping-arms forming no part of the present invention, but fully shown and described in my application No. 243,061, filed July 1, 1887.

The driving-shaft is provided at its forward

end with a double crank consisting of the arm f' , having the pin or stud f^2 , provided with an extension, f^3 , having a pin or roller-stud, f^4 , the pin f^2 being surrounded by the upper end of the pitman d , connected to the needle-bar D by the collared stud d' . The arm f' is rigid with the said driving-shaft, and the arm or extension f^3 is rigid with the said arm f' .

The take-up arm J is carried by a sleeve or tubular rock-shaft, L, supported by a stud or pin, M, screwed into one side of the head C, said take-up arm extending outside or in front of the face plate c . The sleeve or rock-shaft L is provided with an operating-arm, N, having a slightly curved slot in which works the pin or roller-stud f^4 of the double crank, and the said rock-shaft is preferably so located that its center is in the same horizontal plane as the center of the driving-shaft F.

To secure a proper timing of the parts, the studs or crank-pins f^2 and f^4 are arranged about ninety degrees in the arc of a circle from each other, the latter following the former; but the exact arrangement of these pins is not essential, as the correct timing can be effected by making the slot of the operating-arm N more or less curved or irregular. By making the slot of the arm N somewhat curved, as shown in the drawings, a better timing of the parts is secured. The crank-pins f^2 and f^4 are in different radii of the circle or circles in which they rotate, and are preferably at about ninety degrees from each other, as shown in the drawings.

In the operation of my machine the needle descends and the loop thrown out therefrom is caught by the shuttle when the parts are in the position shown by Fig. 2, and as the shuttle moves forward to the position shown by Fig. 3 the take-up arm descends, giving up or yielding the thread to permit the loop to be properly expanded around the shuttle, and when the body of the latter is about half through the loop the take-up begins its upward movement, quickly drawing up the loop out of the way of the advancing point of the shuttle, the take-up operation being completed and the stitch tightened when the parts arrive at the position shown in Fig. 4 when the needle is just beginning its descent for the next stitch. Thus the whole take-up operation is effected during the time required for about a quarter-revolution of the driving-shaft, the larger part of the movement of the take-up being effected rapidly, owing to the close proximity of the crank-pin f^4 to the center of movement of the take-up arm; but when the operation of tightening the stitches is approaching completion the said crank-pin has receded considerably from the take-up rock-shaft, traveling in the slot of the operating-arm, and the leverage of the said pin on said arm is therefore corre-

spondingly increased, and the movement of the take-up arm is correspondingly lessened, so that by the time the last pull of the take-up on the thread in tightening the stitch occurs the take-up has nearly come to a stop, and there is therefore no sudden jerk on the thread when the greatest strain comes, and the danger of breaking the thread by the take-up is therefore reduced to a minimum, as above stated.

I claim—

1. In a sewing-machine, the combination, with the needle operating shaft provided with a double crank having two crank pins or studs which are in different radii of the circle or circles in which they rotate, of a needle-bar operatively connected with one of the said crank-pins, and a take up rock-shaft having rear and front arms, the said rear arm being operatively connected with the other of the said crank-pins, and the said front arm extending in front of the face plate and serving as the take-up proper.

2. In a sewing-machine, the combination, with a bracket-arm and its head, of a needle-operating shaft journaled in said arm and provided at its forward end with a double crank having two crank-pins which are in different radii of the circle or circles in which they rotate, a needle-bar operatively connected with one of the said crank-pins and having vertical bearings in the said head, and a take-up rock-shaft journaled to one side of the said head and provided with a take-up arm extending in front of the face-plate of the said head, and with a slotted operating-arm extending within the head and being engaged by the other of the said crank-pins.

3. In a sewing-machine, the combination, with a bracket-arm and its head, of a needle-operating shaft journaled in said arm and provided at its forward end with a double crank having two crank-pins which are in different radii of the circle or circles in which they rotate, a needle-bar operatively connected with one of the said crank-pins and having vertical bearings in the said head, and a take-up rock-shaft journaled to one side of the said head, and provided with a take-up arm extending in front of the face-plate of said head, and with a slotted operating-arm extending within the head and being engaged by the other of the said crank-pins, the center of the said rock-shaft being in the same horizontal plane as the center of the said needle-bar-operating shaft.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES BOLTON.

Witnesses:

HENRY CALVER,
EWELL A. DICK.