

(Model.)

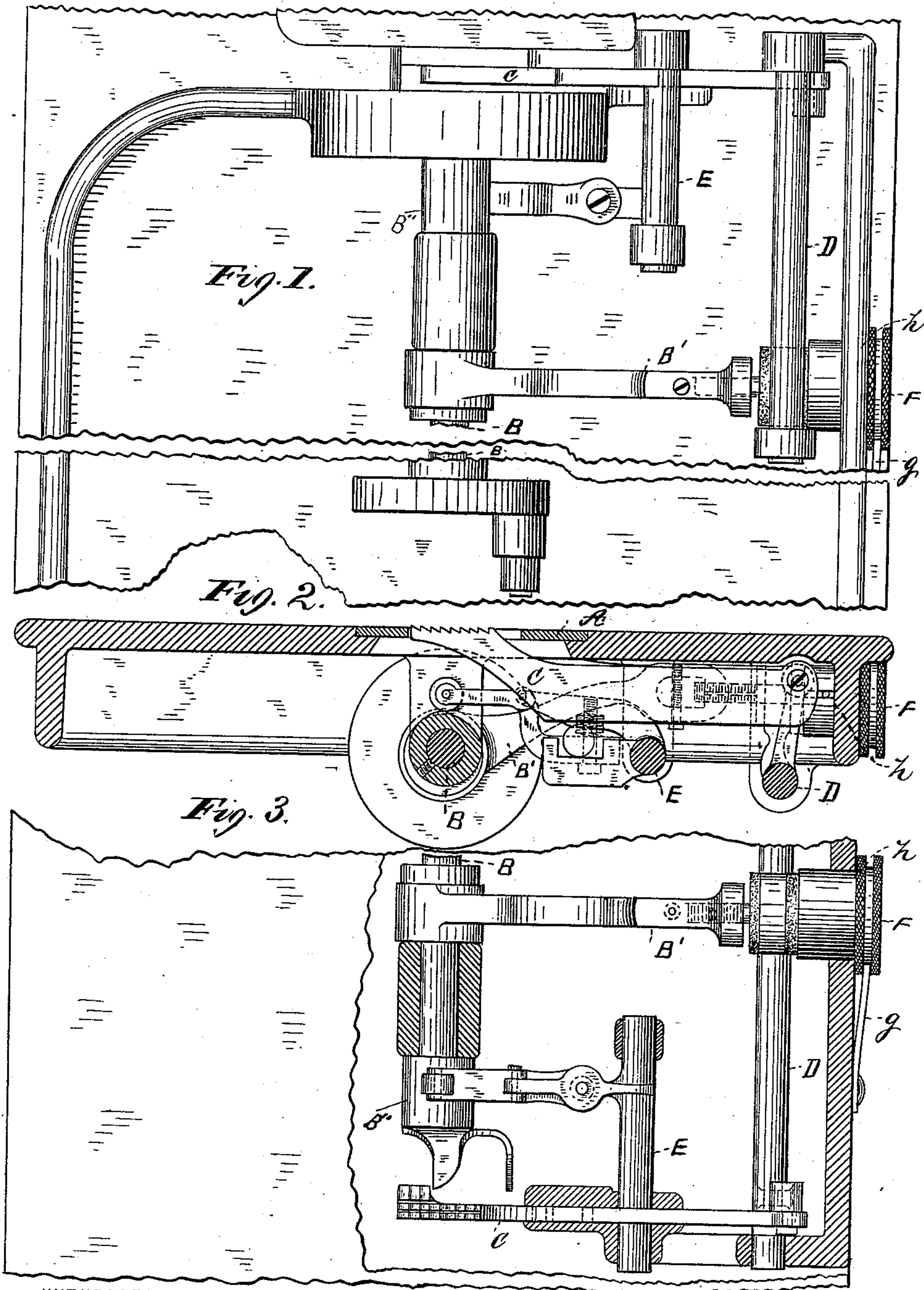
2 Sheets—Sheet 1.

W. A. MACK.

FEEDING MECHANISM FOR SEWING MACHINES.

No. 447,251.

Patented Feb. 24, 1891.



WITNESSES:

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(Model.)

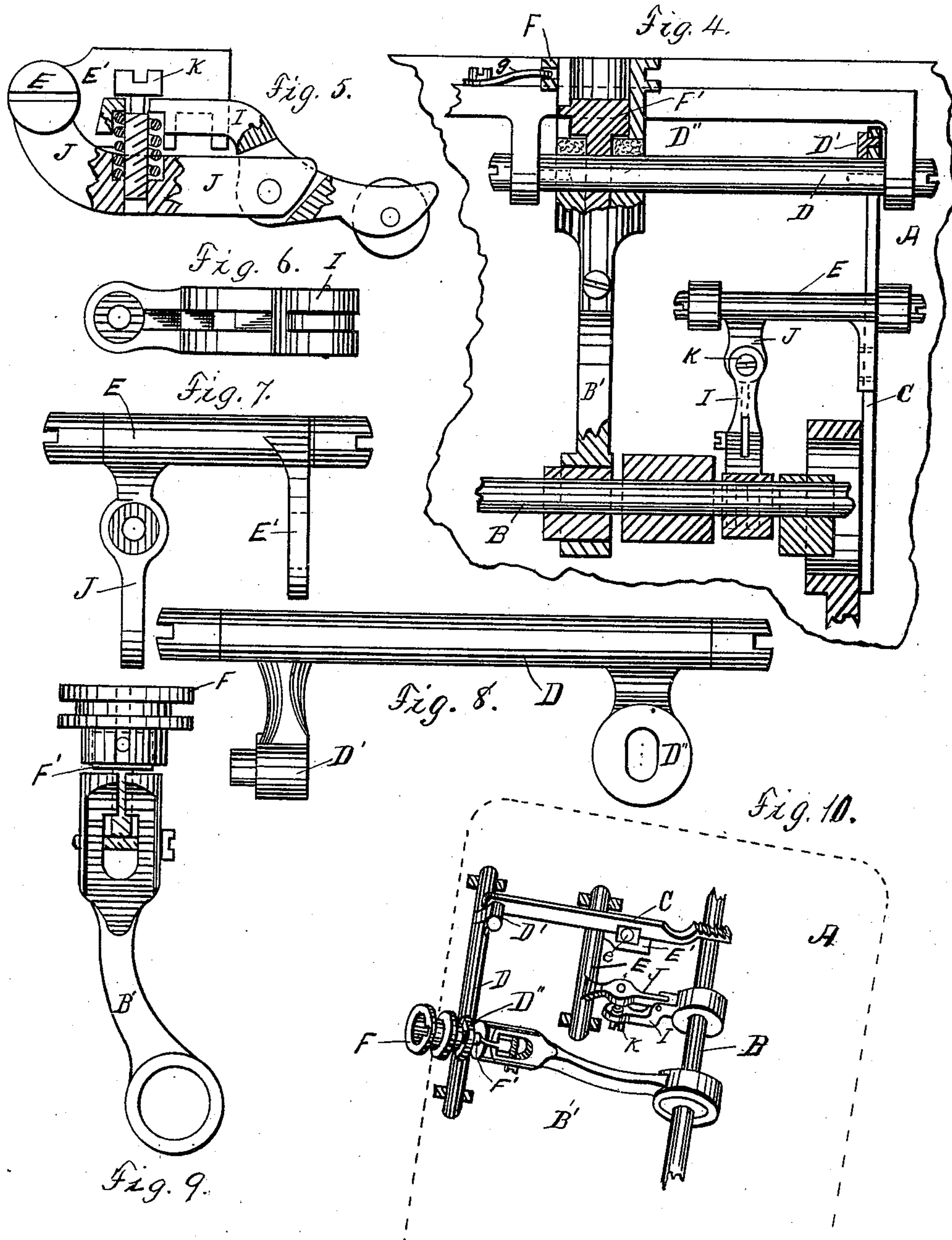
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Joseph M. Crane  
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# UNITED STATES PATENT OFFICE.

WILLIAM A. MACK, OF NORWALK, OHIO, ASSIGNOR TO THE STANDARD SEWING MACHINE COMPANY, OF OHIO.

## FEEDING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 447,251, dated February 24, 1891.  
Original application filed April 25, 1885. Serial No. 163,395. Divided and this application filed September 12, 1885. Serial No. 176,879. (Model.)

*To all whom it may concern:*

Be it known that I, WILLIAM A. MACK, a citizen of the United States, residing in the city of Norwalk, county of Huron, and State of Ohio, have invented certain new and useful Improvements in Feeding Mechanism for Sewing-Machines, of which the following, taken in connection with the drawings, is a specification.

My invention, which forms one of the several divisions of my application, No. 163,395, filed April 25, 1885, all relating to sewing-machines, relates more particularly to the feeding mechanism whereby the material to be stitched or otherwise operated upon is fed along over the cloth-plate of the machine; and it consists, first, in the mechanism and means for operating the same whereby the said mechanism as a whole is greatly simplified and unnecessary friction avoided; second, in the means and arrangements of parts whereby the stitch is varied in length, and, third, in the means for adjusting the upper surface of the feed-dog either up or down, whereby the removal of parts for such adjustment may be avoided, and in other combinations hereinafter detailed, and more specifically pointed out in the claims.

Referring to the drawings, Figure 1 represents a portion of the under side of the bed-plate of a sewing-machine exposing to view the driving-shaft and the lever for operating the feed mechanism. Fig. 2 represents an end view of the several operating parts, consisting of the feed-dog, feed-adjusting device, operating-levers, &c., partly in section and in dotted lines, showing the arrangement of the same. Fig. 3 represents a top view, with a section of the bed-plate removed, of the serrated feed-dog, rock-shaft levers, adjusting nut or screw for regulating the stitch, &c., partly in section. Fig. 4 represents a bottom view, partly in section, of the feed-bar and its adjusting mechanism. Fig. 5 represents a side view of a part of the feed-adjusting device, partly in section, and Figs. 6, 7, 8, and 9 are views of detached parts of the feed-adjusting device, all to be referred to hereinafter. Fig. 10 represents a top view in perspective with the bed-plate of the machine

removed, showing the arrangement of the various rock-shafts and the connections through which they are operated.

In the drawings, A is the cloth-plate of the sewing-machine.

B is a driving-shaft adapted to rotate and impart motion to sundry operative parts in connection with the feeding mechanism, said shaft being arranged in position beneath the cloth-plate A and operated through the medium of suitable connection by another shaft. (Not shown in the drawings.)

C is a feed-bar. (Shown in detail in Figs. 2 and 3.)

D is a rock-shaft having its bearings in lugs or projections located on the under side of the cloth-plate A, as more clearly shown in Fig. 4, and having connection with the said feed-bar C at one end thereof by an arm-and-pivot connection, as more clearly shown at D' in Figs. 4 and 10. The said rock-shaft D is actuated by the driving-shaft B through the medium of a cam or eccentric located thereon and a connecting-rod B', as will be explained. The said connecting-rod B' has connection at one end with a cam or eccentric located on the driving-shaft B, by which it is operated, as before described, and at its opposite end is provided with a threaded opening adapted to be engaged by the threaded end of an adjusting device F'. Said adjusting device consists of an enlarged head located within and adapted to be operated by a hollow sleeve-like device or screw F, as will hereinafter be more fully described, and is provided with a threaded stem adapted to engage with the threaded opening in the end of the said connecting-rod B', (see Fig. 9,) as before described. The said sleeve-like device F is held in a stationary or fixed position laterally to one side of the cloth-plate of the sewing-machine—in the present instance by a pin g, as more clearly shown in Figs. 3 and 4, which engages a slot h in the periphery of the roughened head of said device F in a manner to allow the latter to be turned or revolved. It is obvious, however, that other means might be employed to hold and retain said screw F in a fixed position laterally in lieu of the pin g without departing from the



spirit of my invention. The said sleeve-like device or screw F is provided with a longitudinal slot in its interior wall, in which a pin or projection located on the head of said adjusting device F' extends, as clearly shown in Fig. 9, and by means of which the said adjusting device F' may be revolved or turned by the sleeve or screw F, and at the same time be allowed to be drawn or moved backward or forward longitudinally, as will appear obvious, by means of its threaded stem engaging the threaded opening in the end of the connecting-lever B'.

The rock-shaft D is provided with an arm at one end thereof, which has a loose connection with the said adjusting device F' between its enlarged head and the head or end of the connecting-rod B'. (See Figs. 2 and 3.) Thus by turning the sleeve or screw F in the proper direction the head of the device F' is drawn either backward or forward to vary the space between the same and the end of the connecting-rod B', between which the arm of the rock-shaft D extends, and, according to the amount of space between the two said heads, the throw of the arm or projection on the rock-shaft is varied according to the amount of lost motion, thus regulating the throw of the rock-shaft D and the feed-bar, which is connected to the opposite end of said shaft, as before explained.

E represents another rock-shaft, supported and held in position by two lugs or flanges located on the under side of the cloth-plate A, and is provided at or near its front end with an arm E', which projects beneath the feed-bar C and is provided with a recess therein, adapted for the reception of a roller e for contact with the under side of said feed-bar, as more clearly shown in Fig. 2, to support and lift the same and allow it to fall at the proper time. Said shaft E may be operated by a cam upon the driving-shaft B, through the medium of a hinged device consisting of parts I and J, (detail views of the same being shown in Figs. 5, 6, and 7,) as will hereinafter be set forth. In this particular instance, however, the cam for actuating the lever E through the medium of parts I and J is formed upon the hub of a shuttle-driver (at B'') of the rotary-shuttle class. Said hinged or adjusting device consists of an arm or extension J of the shaft E, (see Fig. 7,) to the free end of which an elbow-lever I, at its angle or elbow, is pivotally secured, as more clearly shown in Fig. 5. One end of said lever I is connected to the arm J by an adjusting-screw K, as clearly shown in said Fig. 5, and a coiled spring is interposed between the same for the purpose, as will hereinafter appear obvious, and said lever I, at its opposite or free end, is provided with a roller adapted for contact with the said cam, located on the driving shaft or hub of the shuttle-driver, and by which action the shaft E receives its rocking motion to operate the arm E', located on its opposite end thereof, which at its free end engages the under side

of the feed-bar and gives the latter its up-and-down motion.

By turning the screw K in the proper direction it serves to bring the end of said arm or lever I into a greater or less degree of contact with the said cam on the driving-shaft, and thereby adjusts the throw of the shaft E and regulates the vertical or up-and-down throw of the feed-bar, as will appear obvious.

Having thus set forth my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination, in a sewing-machine provided with a main driving-shaft carrying a shuttle and an eccentric or cam, a reciprocating feed-dog having connection with and operated by a rock-shaft, and a reciprocating connecting-rod having connection at one end with said cam or eccentric on the driving-shaft and at its opposite end provided with an adjusting device, substantially as described, for adjustable connection with said rock-shaft or part thereof, of a secondary rock-shaft provided at or near one end with an arm or extension for engagement with the feed-dog to give the latter its up-and-down motion, and at or near its opposite end is provided with a pivoted lever and an adjusting-screw for the latter to adjust its free end, which is engaged by a cam or eccentric on the driving-shaft, substantially as described, and for the purpose set forth.

2. The combination, in a sewing-machine, with a driving-shaft provided with a cam or eccentric thereon and a feed-dog horizontally reciprocated by said driving-shaft through the medium of a rock-shaft, a rod connecting said rock-shaft and the said cam or eccentric, said connecting-rod being provided with a shoulder or projection, and an adjusting-screw adapted to engage with an arm of said rock-shaft to operate the latter, of a secondary rock-shaft provided with an arm for engagement with the feed-dog to give the latter an up-and-down movement and with a pivoted or hinged arm or lever for engagement with a cam or eccentric on the driving-shaft to operate said rock-shaft, and means for adjusting said pivoted or hinged lever, substantially as described, and for the purpose set forth.

3. The combination, in a sewing-machine, with the main driving-shaft, a feed-dog horizontally reciprocated by a rock-shaft, a cam located on said driving-shaft, and a rod connecting said rock-shaft and cam, of a secondary rock-shaft provided at one end with an arm for engagement with said feed-dog and at its opposite end with a hinged or pivoted arm for engagement with an operating cam or eccentric on the driving-shaft, and a spring and adjusting-screw for adjusting the engaging end of said pivoted lever in its relation to its engaging cam or eccentric, substantially as described, and for the purpose set forth.

4. The combination, in a sewing-machine, of a feed-dog horizontally reciprocated by a



rock-shaft, connecting-rod, and a cam or eccentric secured on the lower driving-shaft, an intermediary rock-shaft provided at or near one end with an arm projecting beneath the  
5 feed-dog, and a supporting-roller to relieve the bearing-surface from friction and at or near its opposite end with another arm or extension having a secondary arm hinged at or near its center thereto, the free end of which

is adjusted for a greater or less degree of contact with a cam or eccentric on the driving-shaft to adjust the throw of said secondary rock-shaft, substantially as described, and for the purpose set forth.

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Witnesses:

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FRANK MACK.