

(No Model.)

2 Sheets—Sheet 1.

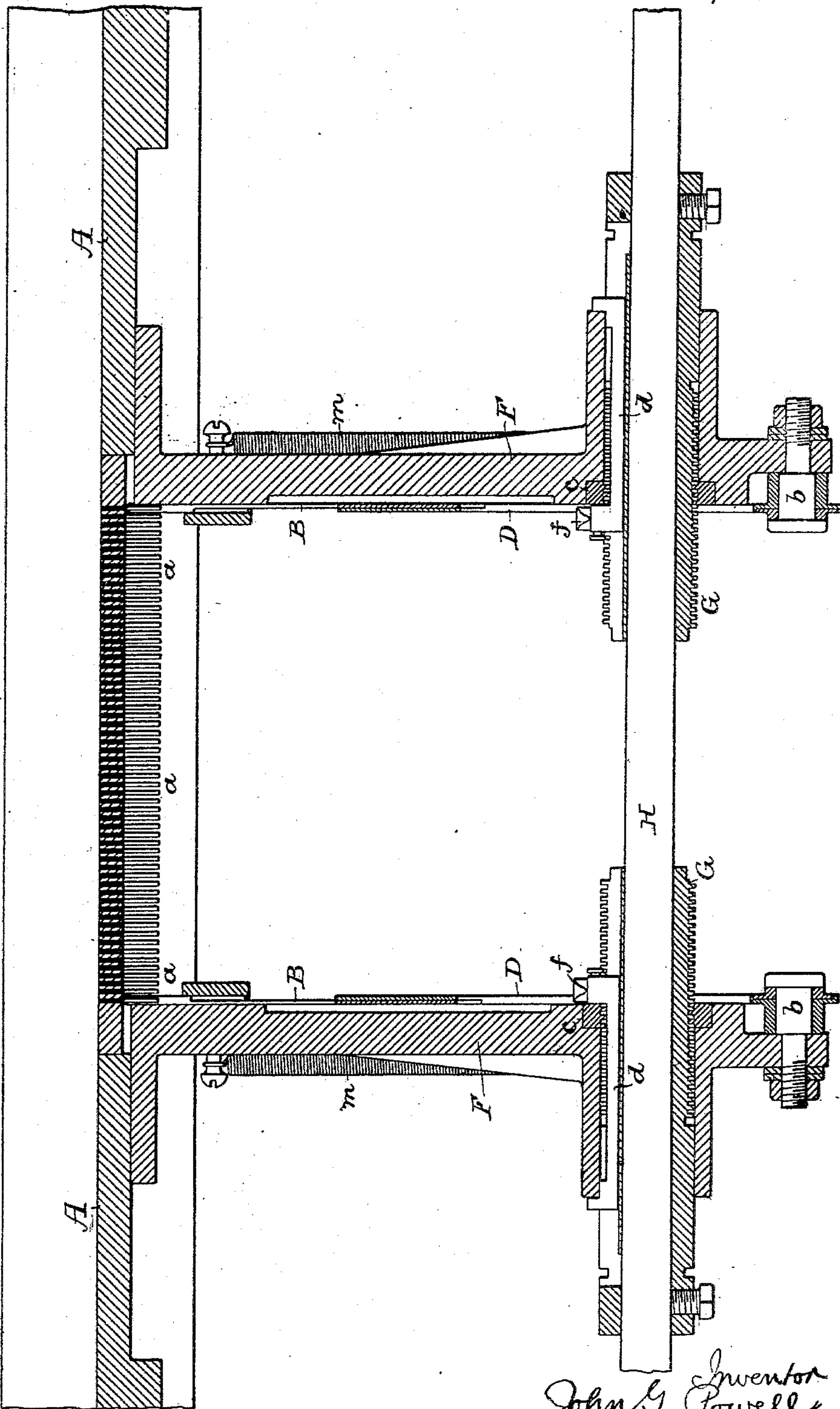
J. G. POWELL.

NEEDLE PICKING MECHANISM FOR AUTOMATIC KNITTING MACHINES.

No. 510,935.

Patented Dec. 19, 1893.

FIG. 1.



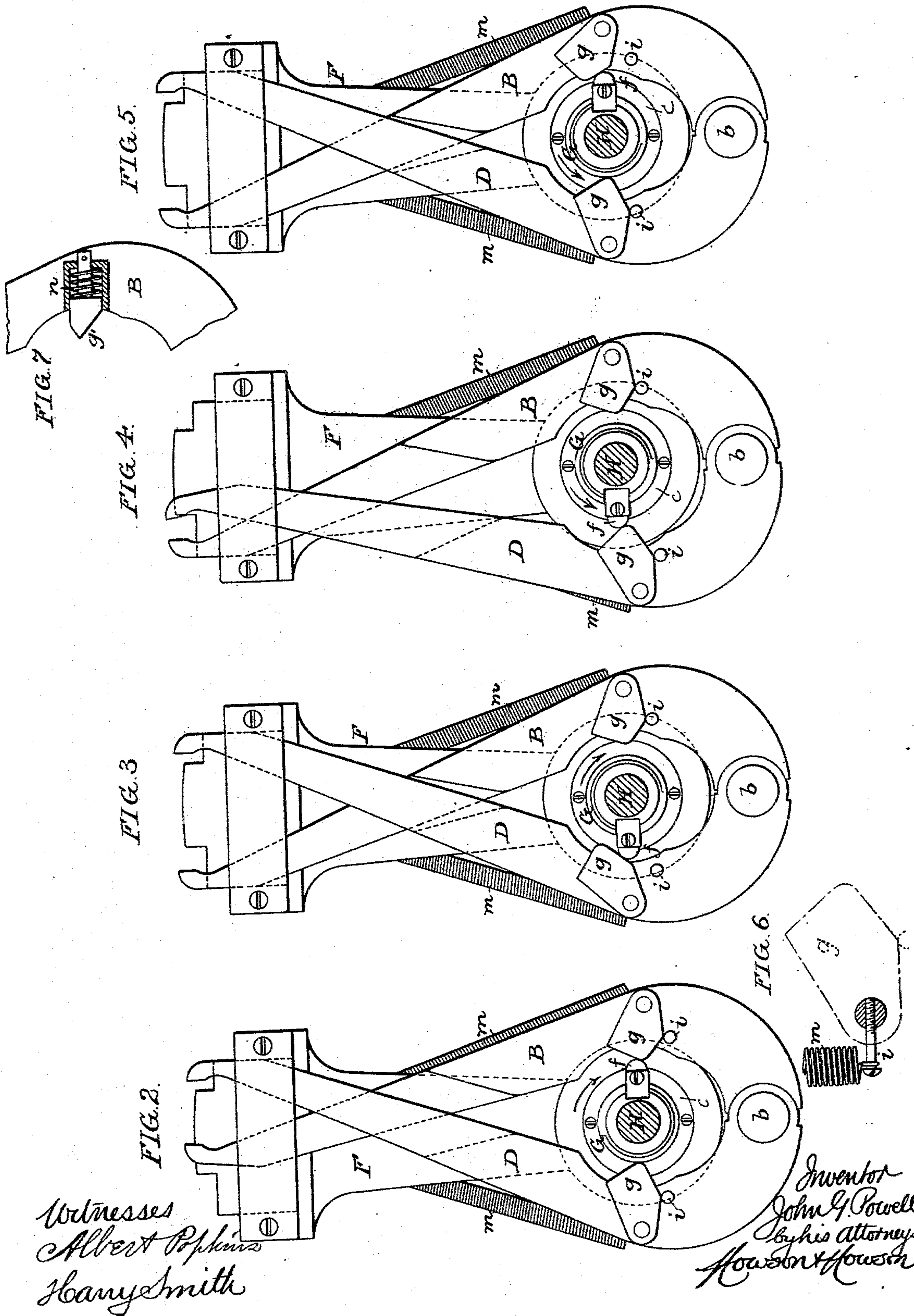
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(No Model.)

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UNITED STATES PATENT OFFICE.

JOHN G. POWELL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO EDWARD POWELL, OF SAME PLACE.

NEEDLE-PICKING MECHANISM FOR AUTOMATIC KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 510,935, dated December 19, 1893.

Application filed March 25, 1893. Serial No. 467,622. (No model.)

To all whom it may concern:

Be it known that I, JOHN G. POWELL, a citizen of the United States, residing at Philadelphia, Pennsylvania, have invented certain Improvements in Needle-Picking Mechanism for Automatic Knitting-Machines, of which the following is a specification.

My invention consists of certain improvements in mechanism for operating the needle picking arms or fingers of an automatic knitting machine, such as shown and described in Letters Patent No. 440,389, dated November 11, 1890, the object of my present invention being to so construct such mechanism as to permit of the use of said needle picking arms in machines of finer gage than was possible with the devices originally employed. This object I attain in the manner hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1, is a longitudinal section of sufficient of the machine to illustrate my present invention. Figs. 2, 3, 4 and 5, are transverse sections, mainly in elevation, illustrating the operation of the parts constituting the subject of my invention. Fig. 6, is an enlarged view of part of the device; and Fig. 7, is a view illustrating a modification.

In Fig. 1, A represents part of the fixed frame or bed of the machine having suitable slots for the guidance of the needles, each of the latter being provided with a projecting bit or tongue *a* for the action of a picking arm B or D, both of these arms being pivoted at their lower ends by means of a pin *b* to a sliding carrier F, two of these carriers being employed in each machine, the arms B and D for acting upon the needles at one end of the fashioning set being mounted upon one carrier, and the arms for acting upon the needles at the opposite end of the set being mounted upon the other carrier.

Each of the carriers F is mounted upon a feed screw G secured to a shaft H, the thread of one screw G being right-handed and that of the other left-handed, so that when the shaft H is turned in one direction the carriers F will be caused to move toward each other, and when said shaft is turned in the opposite direction, said carriers will be caused to move apart from each other.

Each of the feed screws G is engaged by a nut *c* on its respective carrier F, and is grooved for the reception of the spline *d* which overlaps the hub of the carrier so that it is compelled to travel longitudinally with said carrier, while, at the same time, it is caused to rotate with the feed screw, and each spline *d* has a projecting toe *f* which, in the patented machine, was adapted to act directly upon the arms B and D so that as the shaft H and its feed screws were rotated the picking arms B and D of each carrier were vibrated alternately, while at the same time they were moved along longitudinally with the carriers. The outward swing of the arm B due to the action of the toe *f* caused movement of the needle in one direction when the upper end of said arm was in line with the bit *a* of the needle at the time of such movement, and the outward movement of the arm D under like conditions caused movement of the needle in the opposite direction. For instance, the described movement of the arm B caused the outward movement of the needle so as to carry its bit away from the control of the knitting cams, while the movement of the arm D caused the restoration of the needle to operative position. When the carriers F are moving toward each other the arms B only should be operative so as to throw out of action needle after needle successively at opposite ends of the fashioning set, and when the direction of movement of the shaft is reversed and the carriers F are moved from each other the arms D only should be operative so as to bring needle after needle of the fashioning set into operation again, in reverse order as compared with that in which they were put out of action. As both of the arms B and D, however, were in the former machine operated on each rotation of the feed screw, it was necessary to so construct and arrange the parts that during the inward movement of the carriers F the upper ends of the picking arms D vibrated in the spaces between the needles, the arms B likewise operating on the outward movement of the carriers. Consequently the gage of the machine was coarse, owing to the necessity of spacing the needles so widely as to provide for the free play of the inoperative picking arm between the bits *a*. In order to overcome

this objection I now provide each picking arm with a lug for the action of the toe *f*, which lug is rigid as against pressure in one direction, but yields against pressure in the opposite direction, thus, as shown in Figs. 2 to 5 of the drawings, each arm is provided with a lug *g* pivoted to the arm at its outer end and normally resting upon a pin *i* on the arm. When, therefore, the feed screw *G* is turning in the direction of the arrow Figs. 2 and 3, the arm *B* only will be operated, the lug *g* of said arm being rigid as against pressure in this direction, as shown in Fig. 2, and the lug *g* of the arm *D* being free to rise against such pressure as shown in Fig. 3, while, when the feed screw is turned in the opposite direction, as shown in Figs. 4 and 5, the arm *D* only will be operated, the lug of said arm being rigid against movement in this direction, as shown in Fig. 4, and the lug of the arm *B* being free to yield, as shown in Fig. 5. By reason of this method of operating the arms the needles may be located as closely together as desired, since there is no play of either picking arm between the bits *a*. After each movement of either arm due to the action of the toe *f* the arm is restored to its normal position by means of a spring *m*, and said spring also serves to hold the lug *g* of the arm in normal position, by reason of the fact that the lower end of the spring is connected to a pin *i* projecting from the pivot pin *m* of the lug, as shown in Fig. 6.

Various modifications in the mode of constructing and supporting the lug may, however, be adopted within the scope of my invention. For instance, a sliding lug *g'* under the influence of a spring *n*, as shown in Fig.

7, may be used in place of the pivoted lug, although the latter is preferred.

One face of the lug *g'* should be so beveled that said lug will yield under the action of the toe *f* more easily than the arm *B* or *D*, but the other face is such that it will not yield more readily than the arm under such action.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The combination of the carrier and its pivoted needle picking fingers, with the feed screw, the picking toe rotating therewith and traveling with the carrier, and lugs on the needle picking arms, the lug of each arm being rigid as against pressure in one direction, and yielding as against pressure in the opposite direction, and the lug of one arm yielding when the toe is moving in one direction, and that of the other arm yielding when the toe is moving in the opposite direction, substantially as specified.

2. The combination of the carrier, its pivoted arms, the feed screw, the picking toe rotating therewith, the pivoted lugs on the arms, rests for said lugs, and springs connected to arms on the pivot pins of the lugs, and serving to hold both the picking arms and their lugs in the position of rest, substantially as specified.

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

JOHN G. POWELL.

Witnesses:

FRANK E. BECHTOLD,
JOSEPH H. KLEIN.