

No. 687,863.

Patented Dec. 3, 1901.

D. M. SMYTH.

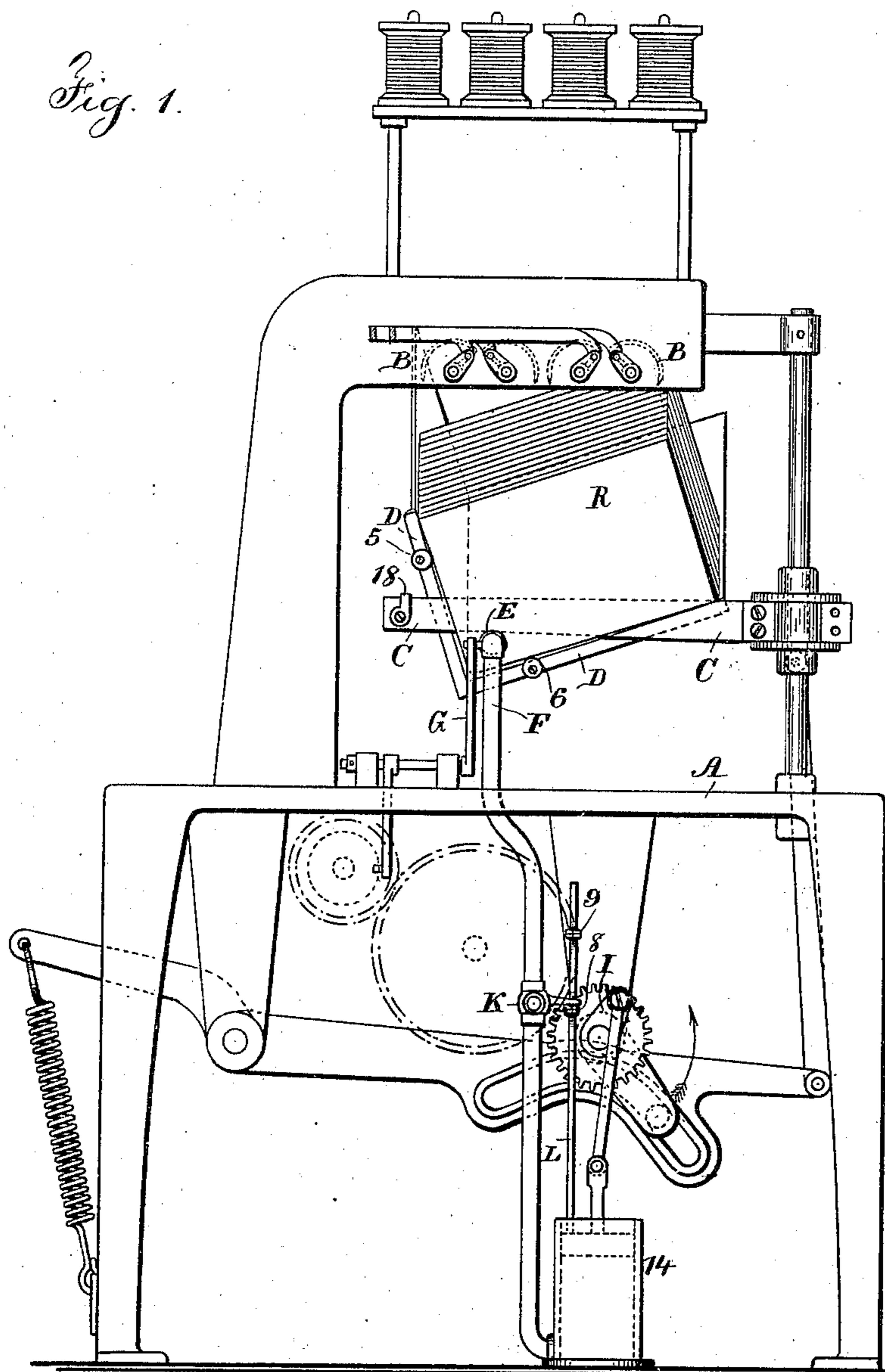
AUTOMATIC FEEDING MECHANISM FOR BOOK SEWING MACHINES.

(Application filed Feb. 27, 1896. Renewed Oct. 23, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



Witnesses

Chas. H. Smith
J. Staib

Inventor

David M. Smyth
per L. W. Ferrell & Son
Attys

No. 687,863.

Patented Dec. 3, 1901.

D. M. SMYTH.

AUTOMATIC FEEDING MECHANISM FOR BOOK SEWING MACHINES.

(Application filed Feb. 27, 1896. Renewed Oct. 23, 1900.)

(No Model.)

2 Sheets—Sheet 2.

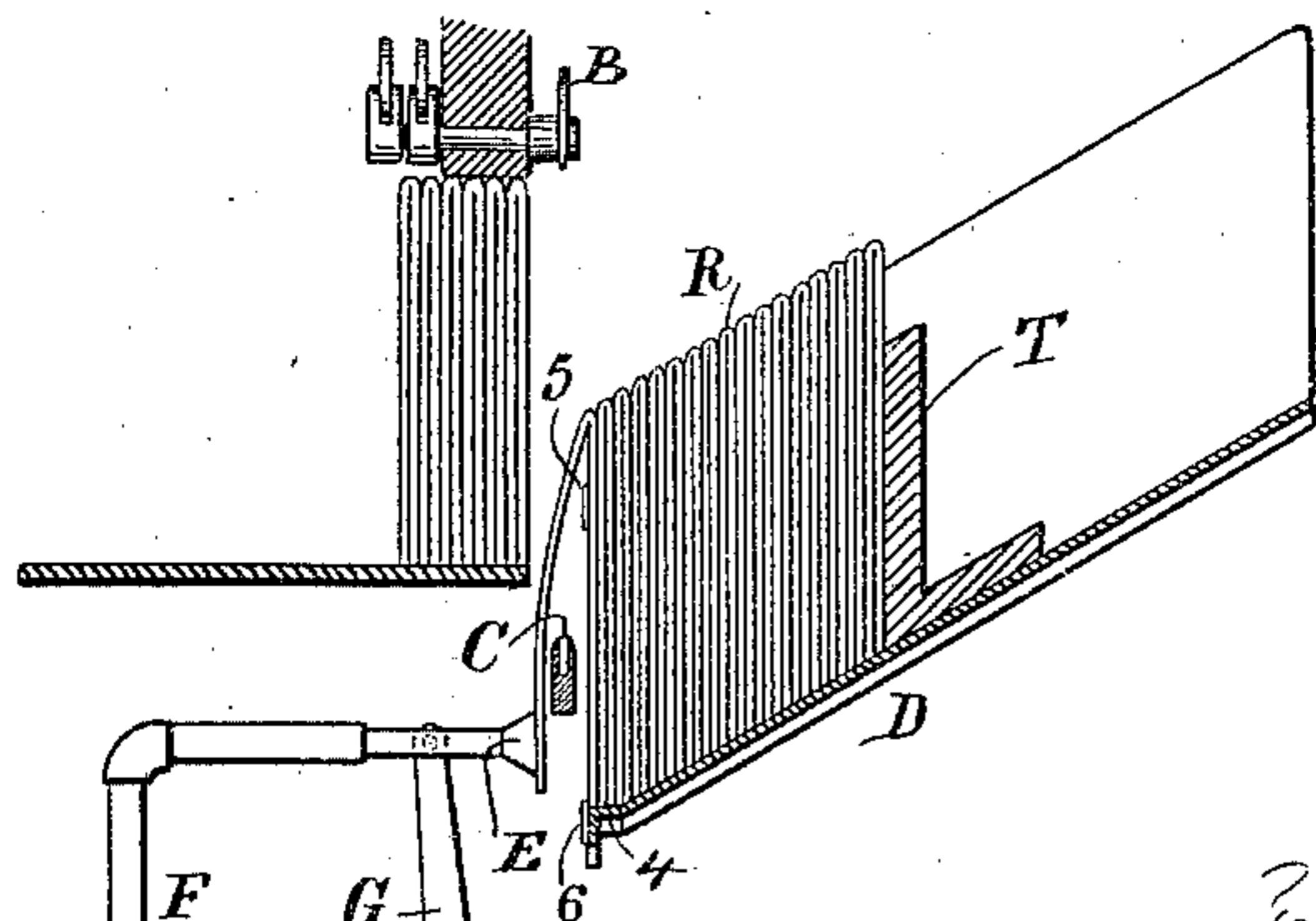
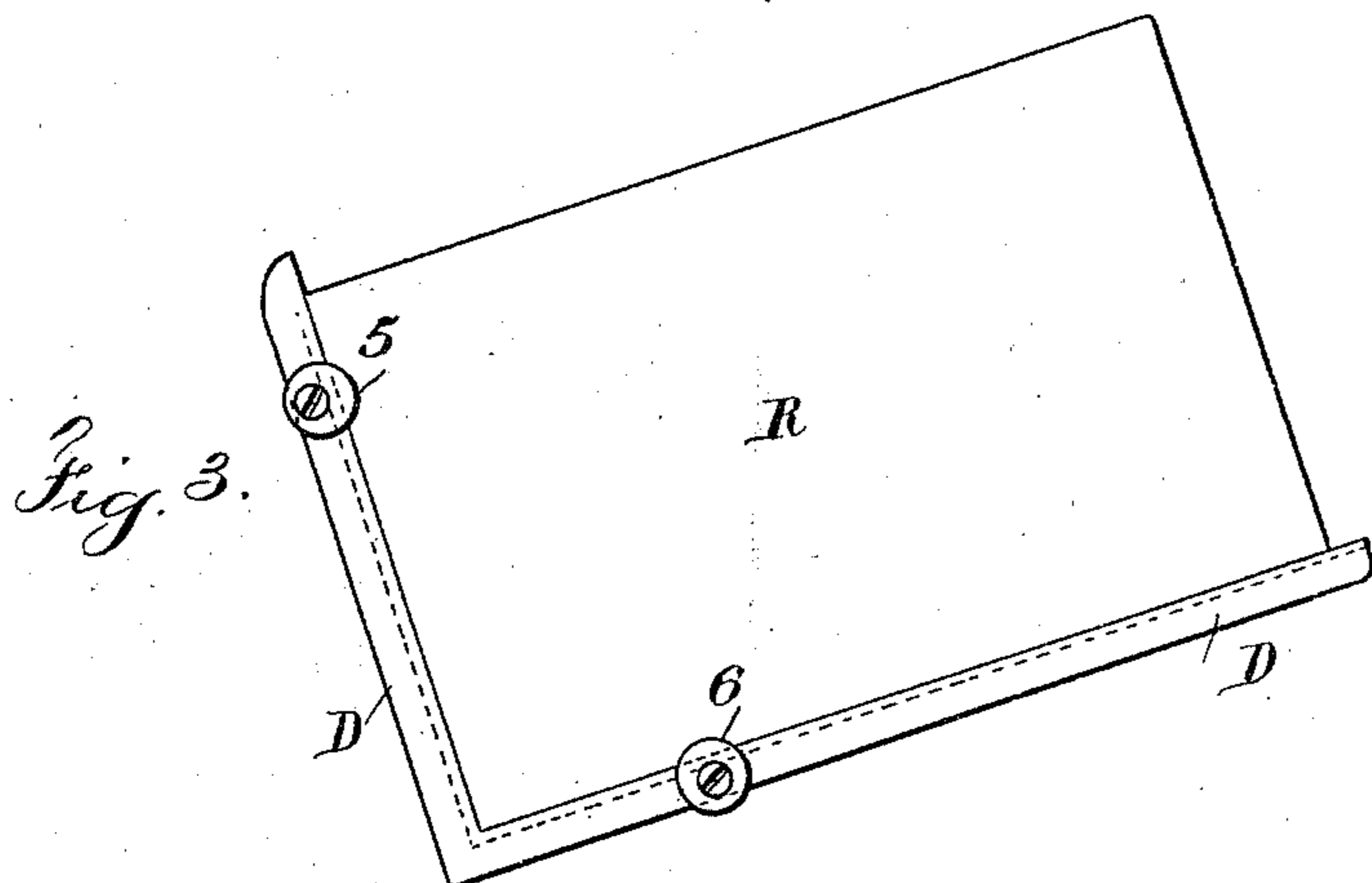


Fig. 4.

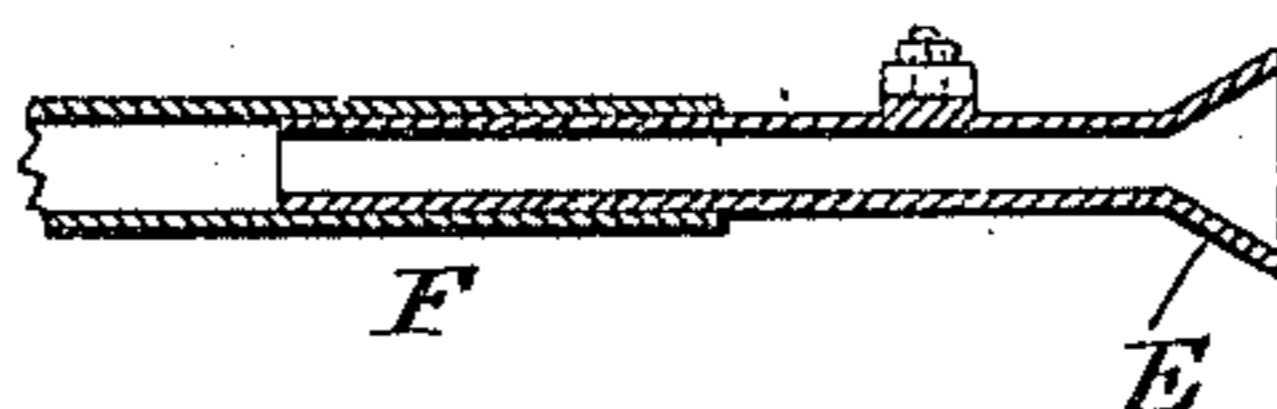
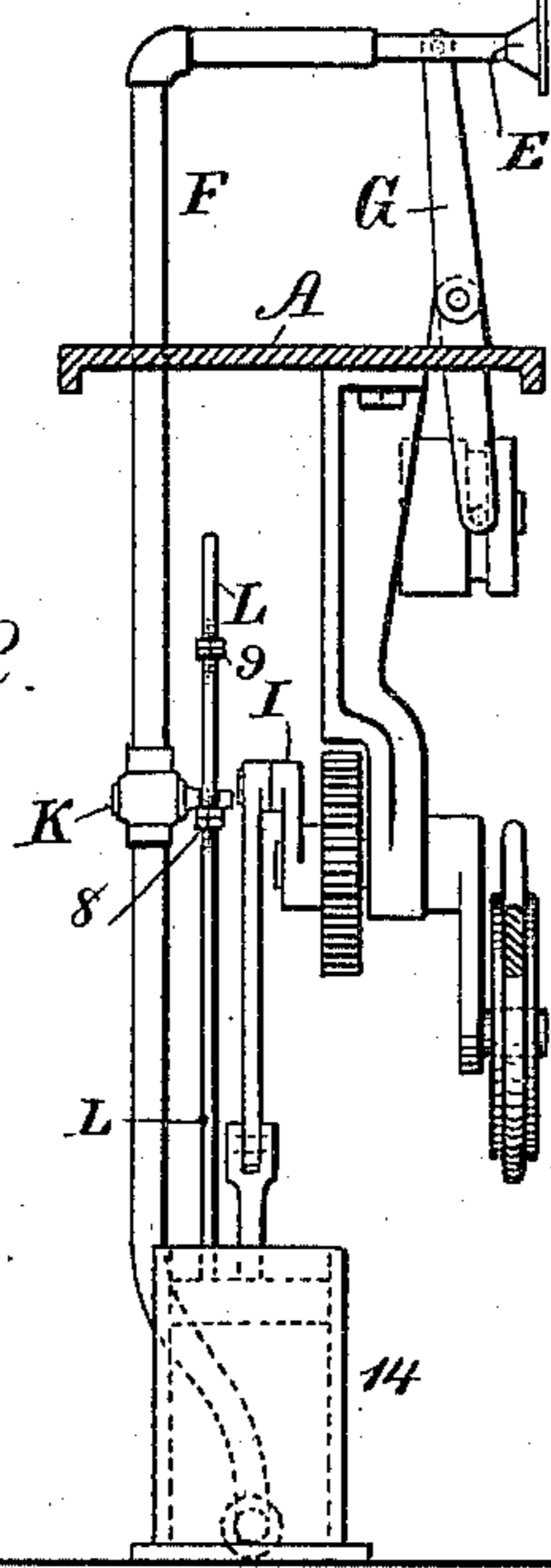


Fig. 2.



Witnesses

Charles H. Smith
J. Staib

Inventor

David M. Smyth
per L. W. Perrell & Son
Attys

UNITED STATES PATENT OFFICE.

DAVID M. SMYTH, OF PASADENA, CALIFORNIA, ASSIGNOR TO FRANK C. BOLT,
TRUSTEE, OF PASADENA, CALIFORNIA.

AUTOMATIC FEEDING MECHANISM FOR BOOK-SEWING MACHINES.

SPECIFICATION forming part of Letters Patent No. 687,863, dated December 3, 1901.

Application filed February 27, 1896. Renewed October 23, 1900. Serial No. 34,062. (No model.)

To all whom it may concern:

Be it known that I, DAVID M. SMYTH, a citizen of the United States, residing at Pasadena, in the county of Los Angeles and State of California, have invented an Improvement in Automatic Feeding Mechanism for Book-Sewing Machines, of which the following is a specification.

There are several book-sewing machines in which the folded signatures are laid upon a sheet-holding arm or bar, the bar coming within the fold and toward the back of the signature, and this bar is lifted up and presents the signature in the proper position to be sewed by the other mechanism of the machine. In Letters Patent No. 220,312, granted to me October 7, 1879, a machine of this character is illustrated; and the present improvements are available with a machine of that character and also with machines such as those illustrated in Patent No. 435,613, granted September 2, 1890, to the Smyth Manufacturing Company, assignees of Reynolds and Jacobs. I do not, however, limit my invention to the book-sewing machine shown in the aforesaid Letters Patent.

In the book-sewing machine with which the present invention can be employed the signatures are to be received into a holder the surfaces of which are inclined, so that the pile of signatures can be received into such holder with the folded back edges upward and with the folded top edges resting against one side, and the holder is inclined toward the delivery end, so that the signatures will slide down toward the sewing mechanism. The sheet-holding bar of the sewing mechanism descends below the lower corner of the receptacle, and a sucker is made use of that is passed above this bar, and by atmospheric action the one half of the folded signature is drawn outward, leaving the other half resting upon the signature-holder, and the sheet-holding bar is raised, so as to pass into the folded signature and lift the same up from the holder and carry it to the place where the sewing is performed. In consequence of the signature being received upon the bar in a slightly diagonal position the head of the folded signature slides toward one end, where

it is arrested by a stop, so that the position of the signature is automatically regulated as the same is carried up to the sewing devices.

In the drawings, Figure 1 is an elevation at the rear of the machine, illustrating the position of the mechanism that controls the action of the sucker. Fig. 2 is a diagrammatic cross-section representing the relative positions of the signature-holder and the sewing mechanism. Fig. 3 is a detached elevation of the receptacle for the pile of signatures, and Fig. 4 is a section of the sucker-tube. Figs. 3 and 4 are on a larger scale than Figs. 1 and 2.

A table is illustrated at A and the book-sewing mechanism at B, and the sheet-holding arm at C is usually horizontal, and it is raised and lowered bodily, and as the sheet-holding arm is lowered it draws down out of the sewed signature, and it is caused to descend below the lower edge or angle of the sheet-holder, so as to be in a position for the sheet to be automatically supplied to such sheet-holding arm before the arm is raised to carry the signature up into position for the same to be sewed.

The receptacle D is preferably formed of two boards or plates at right angles to each other and set at an inclination, so that the tops and outer edges of the signatures R will set into the angle of the receptacle, and the folded-back edges of the signatures will be uppermost, and the receptacle is advantageously set at an inclination, so that the signatures will tend to slide down to the point of delivery by gravity, but there may be a follower T, acted upon by a spring or weight to give motion to the pile of signatures and cause them to progress to the sewing mechanism as the signatures are removed one by one. It is advantageous to make the lower end of the receptacle substantially level in one direction, as shown at 4, and also to apply stops 5 and 6, one to act at the folded top edge of the signature and the other at the loose outer edges of the sheets. Hence the signatures will not pass down and slip off the lower end of the receptacle, but will be taken off successively, as next indicated.

A sucker E is connected with an exhaust-tube F, and the sucker is moved up against

the lower signature in the pile after the sheet-holding arm C has descended, and by the exhaust action the lower half of the folded signature is drawn back, so as to allow the sheet-holding arm C to rise within the signature and carry the signature up to the place where the sewing is performed. This operation can be reliably effected, because the sucker acts near the outer corner of the folded top edge of the signature, and the other part of the fold is detained by the stops 5 and 6, and the lifting action of the sheet-holding arm carries the signature up and away from these stops 5 and 6 with facility, and the next signature comes down into position to be acted upon by the sucker after the sheet-holding arm has again descended.

Any suitable character of stop may be made use of; but it is advantageous to make each stop adjustable, so as to adapt the same to the condition of the signatures that are being acted upon. I have represented the stops 5 and 6 as connected by eccentric screws, so that by loosening either screw the stop may be turned, so as to project more or less above the flat surfaces of the receptacle D, and then such stops can be permanently fastened by tightening the screws.

Any desired mechanism may be made use of for giving motion to the sucker. I have represented the same as having a slide or telescopic tube at the end to be acted upon by a rock-shaft and crank G, and a motion is to be given to the parts at the proper time, so as to act in harmony with the other parts of the machine. The minus atmospheric pressure or suction action can be obtained in any convenient manner. I have represented a pump-cylinder at 14, the piston of which receives its motion by a connecting rod and crank I upon one of the shafts of the machine, and the exhaust-tube F is connected with the lower end of this pump-cylinder, and it is often advantageous to break the vacuum or suction action with regularity and as soon as the sheet-holding arm has passed up into the folded signature, and with this object in view a stop-cock K is shown in the exhaust-tube F and the rod L is connected with the piston of the pump-cylinder 14, and upon this rod L is an adjustable stop 8, that engages the handle of the stop-cock K, and according to the position of the stop 8 upon the rod K so the suction will be brought into action or thrown out of action by a stop 9, and this cock K can either allow the suction to act upon the paper or it can admit air from outside to break the suction action. I have represented the crank that gives motion to the piston of the pump as upon the same shaft that moves the lever for raising and lowering the sheet-holding arm, so that the pump moves in harmony with such sheet-holding arm. As the sheet-holding arm or bar C rises up it will first come into contact with the in-

ner side of the signature at the top of the back, and as the lifting operation progresses there will be a tendency to move the point of contact toward the end of the sheet-holding bar as the same lifts the signature, and the stop 18 is to be applied upon such sheet-holding bar for arresting the movement of the signature in this direction, and in so doing the signature will be brought accurately to its position for sewing to the previous signatures in making up the volume.

If this invention is employed in a sewing-machine such as described in Patent No. 220,312, the mechanism for rotating the shaft and arms may be disconnected, so that the one sheet-holding arm alone may be in action and that will rise and fall by the lifting mechanism, and in so doing the signature will be properly presented to the sewing mechanism.

In Letters Patent No. 250,988, granted to me December 13, 1881, a suction device is employed to act upon the lower edge of the end folded signature as the mass of signatures rest upon an inclined table and adjacent to the sewing mechanism. Difficulty, however, has been experienced in causing the sheet-holding arm to rise properly within the fold of the signature without injury to the edges of the sheets. I have found that by placing the pile of signatures so that the lower edges of the signatures are at an inclination and the folded back edges of the signatures are upward the upper and outer corner of the end signature (which in this position is downward) can be easily drawn out, leaving the other parts of the signature supported by the box or holder, and the sheet-holding arm as it rises passes into the signature without injury to the edges of the leaves and contacts with the signature at the upper end of the back fold, and as it lifts such signature there is a sliding movement at the point of contact, which causes the upper end of the back fold to come against a stop that arrests the movement and accurately determines the position of the signature upon the sheet-holding arm as such signature is carried up to the place where the sewing is performed. By adjusting the position of the collars 8 and 9 the action of the suction device is accurately determined, so that the suction is applied and relieved in harmony with the other parts of the book-sewing machine.

In my application for Letters Patent filed January 30, 1899, Serial No. 703,812, I have shown and claimed devices substantially the same as those herein shown and described; but I have not herein specifically claimed such devices.

I claim as my invention—

The combination with the substantially horizontal sheet-holding bar or arm in a book-sewing machine and means for raising and lowering said arm, of a signature-holder composed of a bottom and end portion at right

angles to each other, said bottom being inclined to the horizontal in two directions, that is, downwardly toward its delivery edge and also downwardly toward said end portion, and
5 means for drawing the downwardly-placed upper corner of the folded signature across the path of the upwardly-moving sheet-holding bar so that said bar will reliably enter at the corner of the signature and then lift the

same to the sewing mechanism, substantially as set forth.

Signed by me this 11th day of February, 1896.

DAVID M. SMYTH.

Witnesses:

JOHN McDONALD,
ANN E. DEAN.