

No. 620,706.

Patented Mar. 7, 1899.

H. E. HAWES.
BUTTONHOLE SEWING MACHINE.

(Application filed July 29, 1897.)

(No Model.)

3 Sheets—Sheet 1.

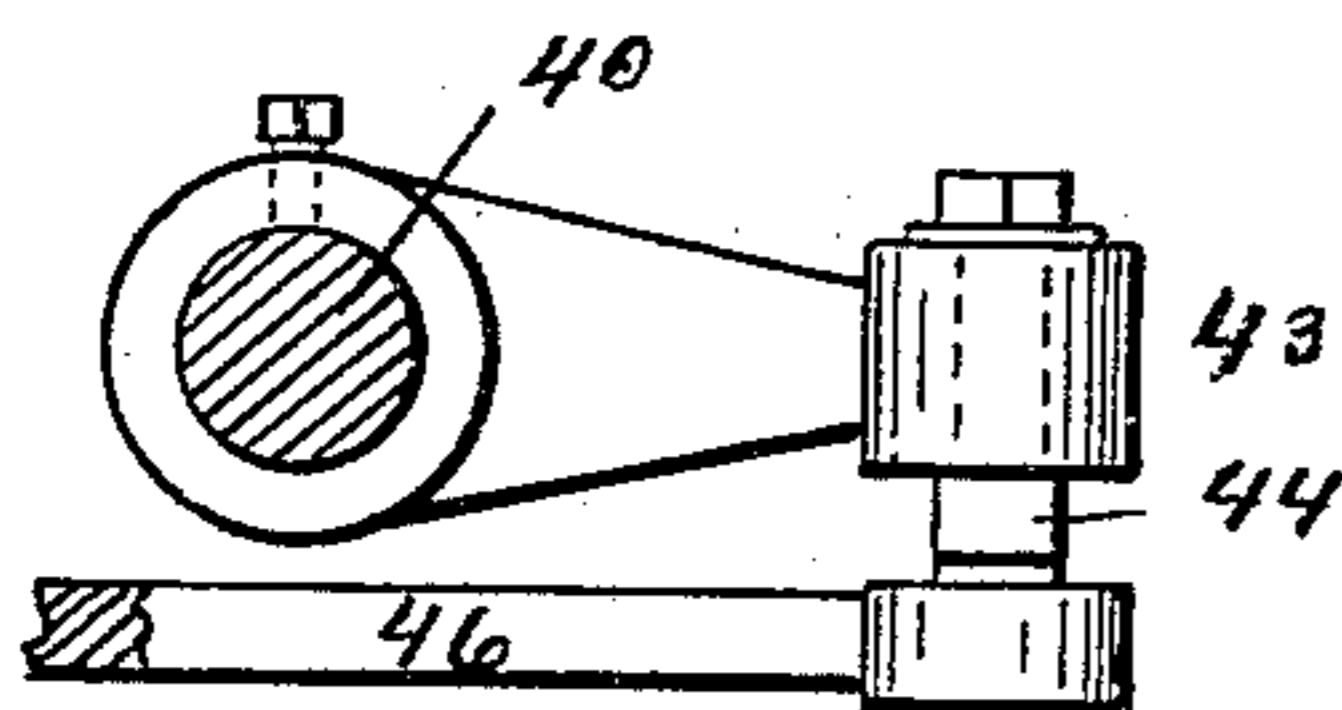
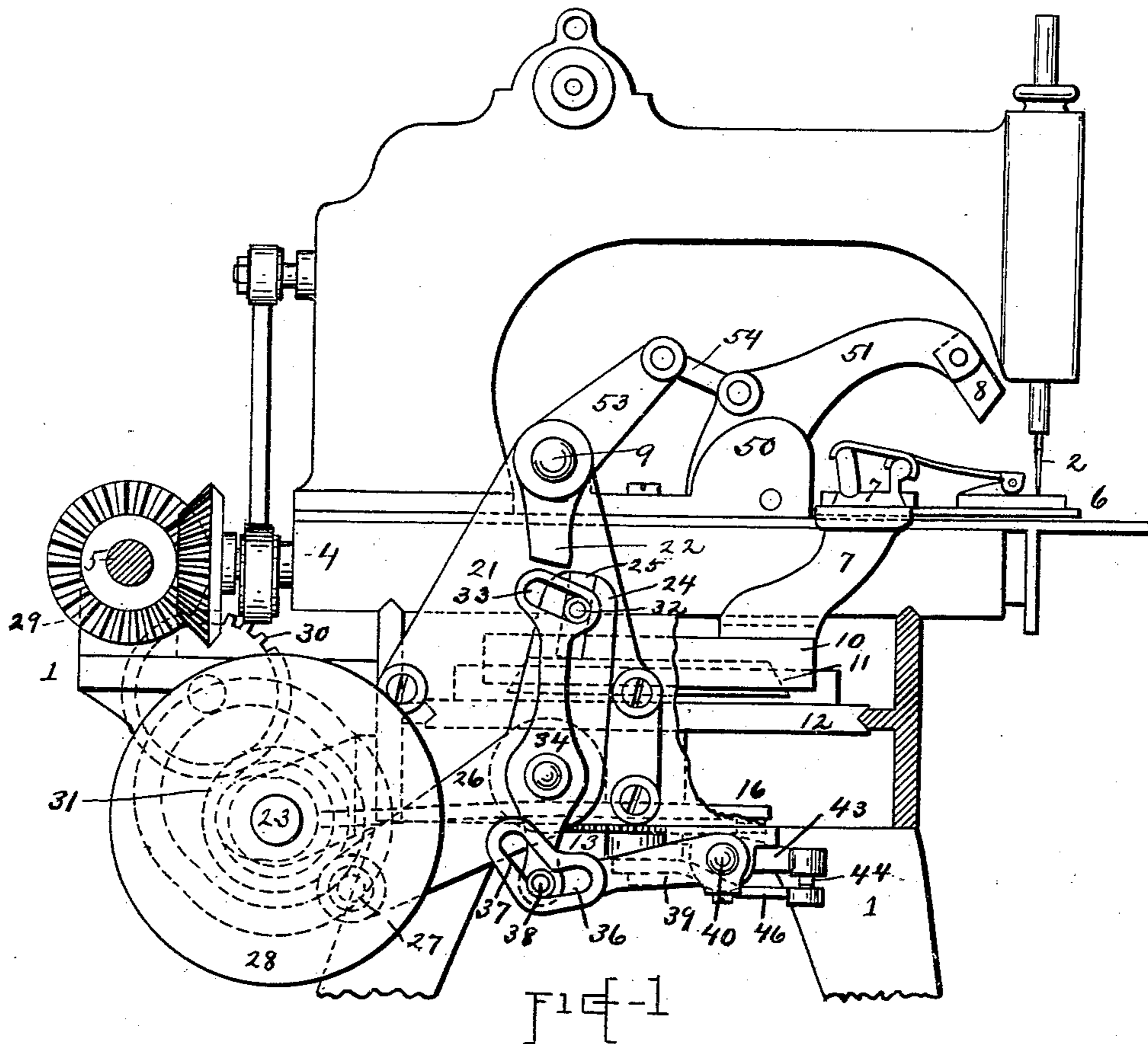


Fig. 4

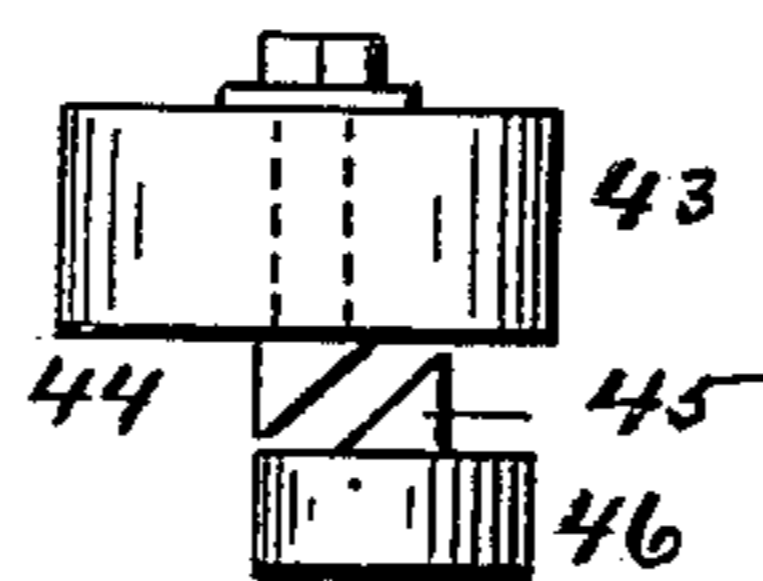


Fig. 5

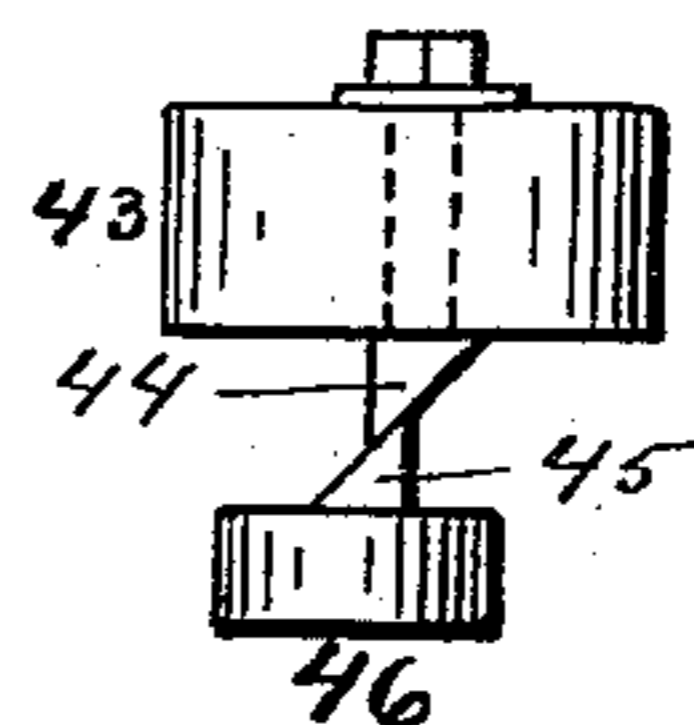


Fig. 6

WITNESSES:

Chester Higgins
B. M. Scott

INVENTOR

Herbert E. Hawes

Clarence D. Binger
ATTORNEY.

No. 620,706.

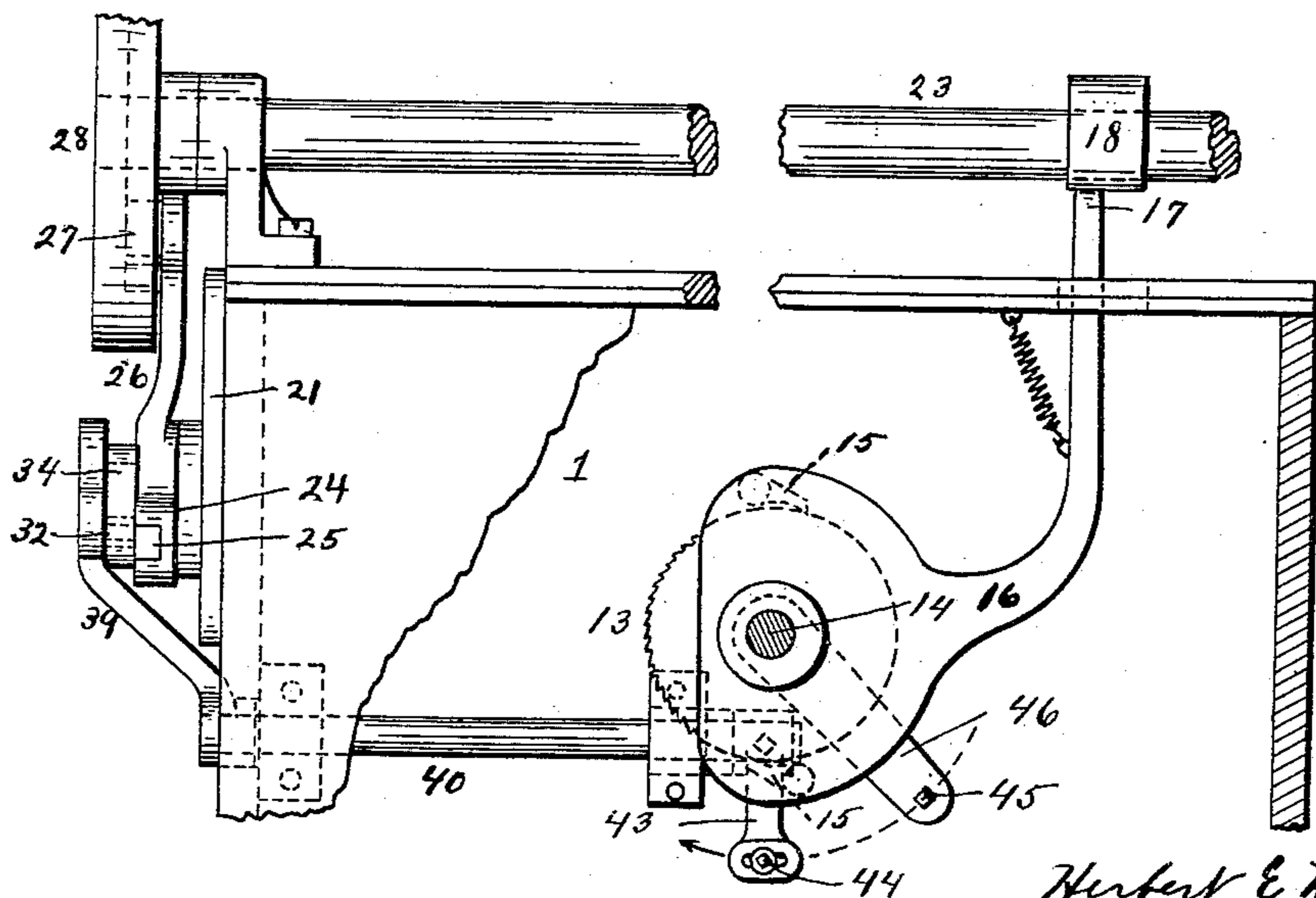
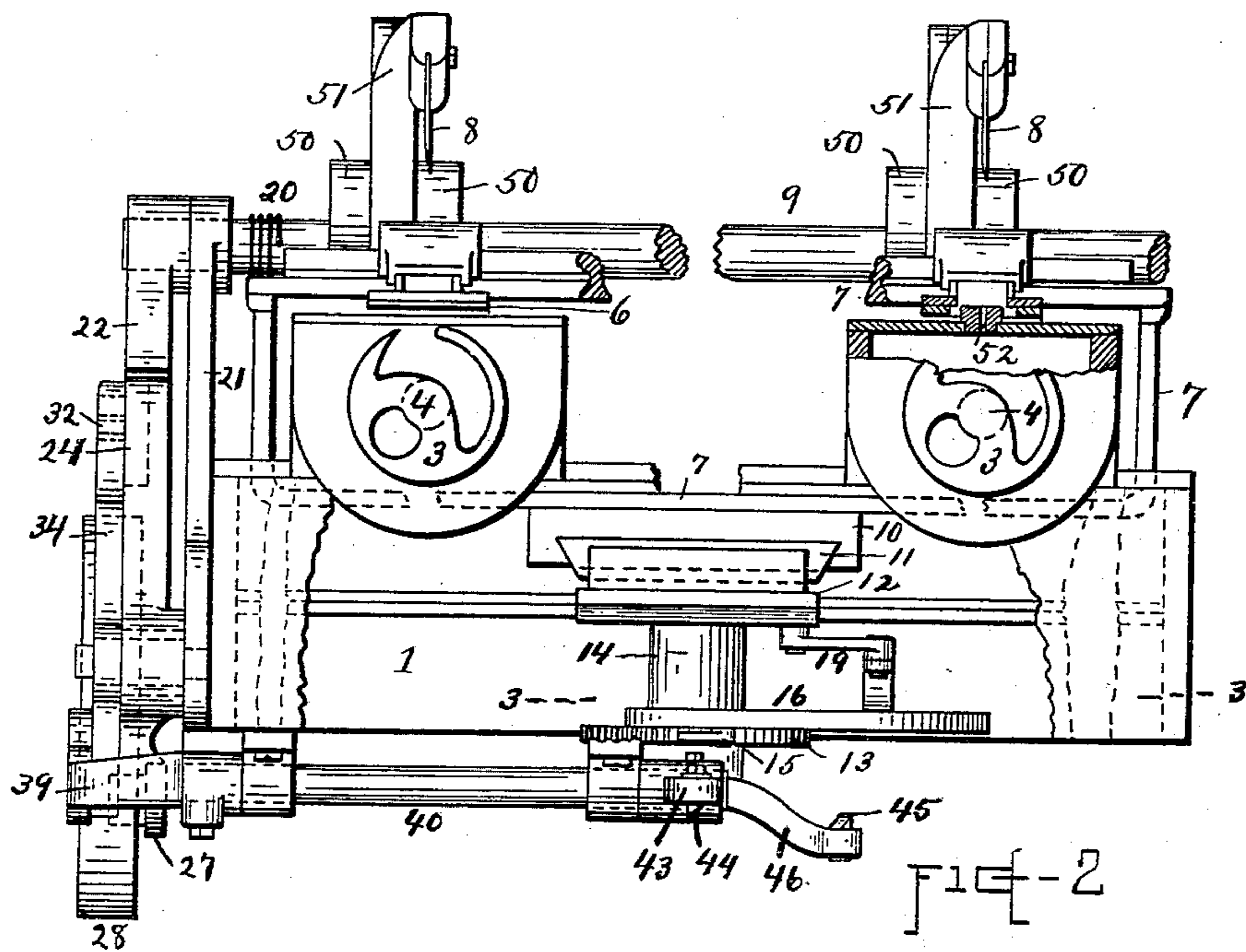
Patented Mar. 7, 1899.

H. E. HAWES.
BUTTONHOLE SEWING MACHINE.

(Application filed July 29, 1897.)

(No Model.)

3 Sheets—Sheet 2.



WITNESSES:

Chester Higgins
B.M. Scott

Fig. 1-3

Herbert E. Hawes
INVENTOR

BY *Clarence H. Hedges*
ATTORNEY.

No. 620,706.

Patented Mar. 7, 1899.

H. E. HAWES.
BUTTONHOLE SEWING MACHINE.

(Application filed July 29, 1897.)

(No Model.)

3 Sheets—Sheet 3.

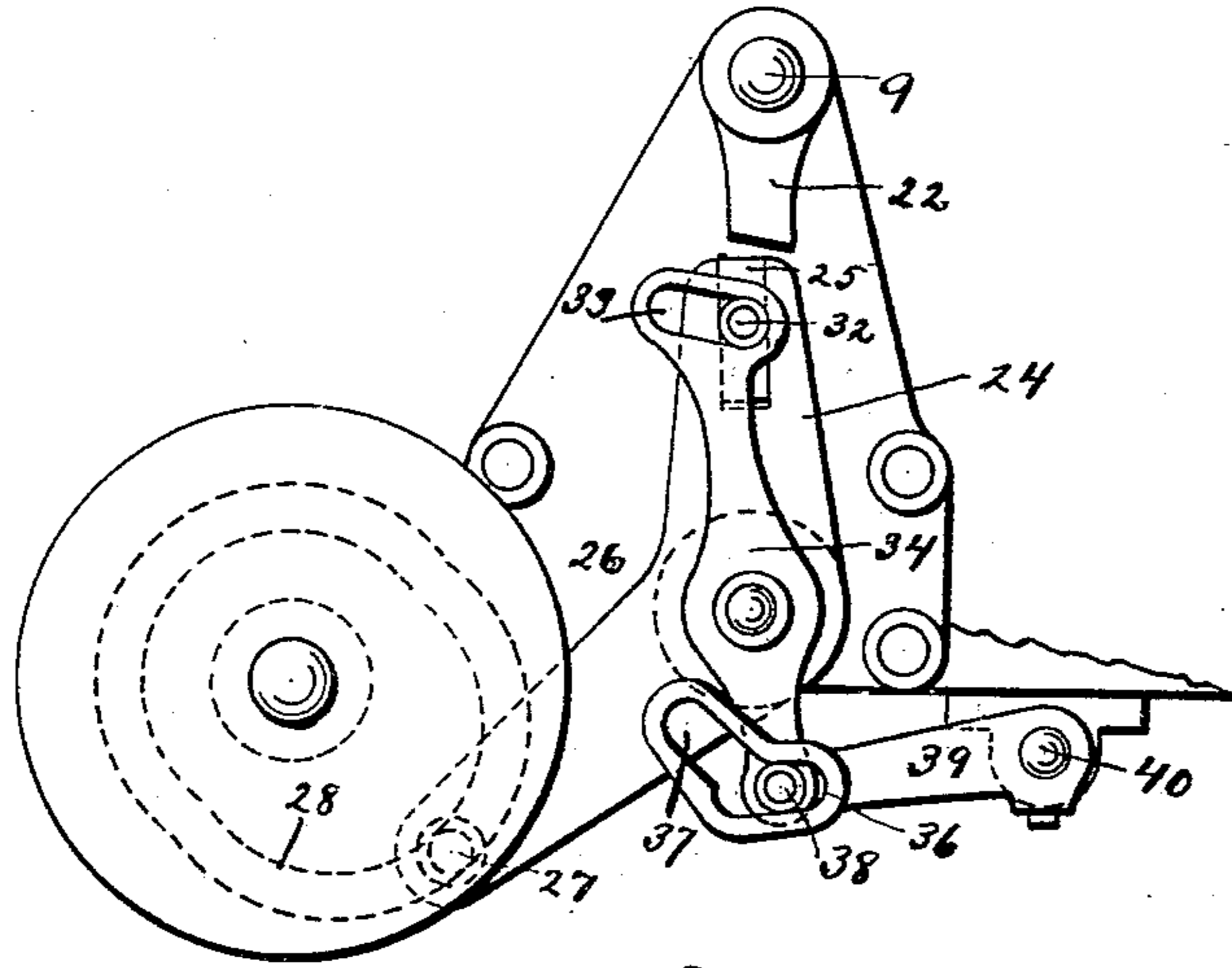


Fig. 7

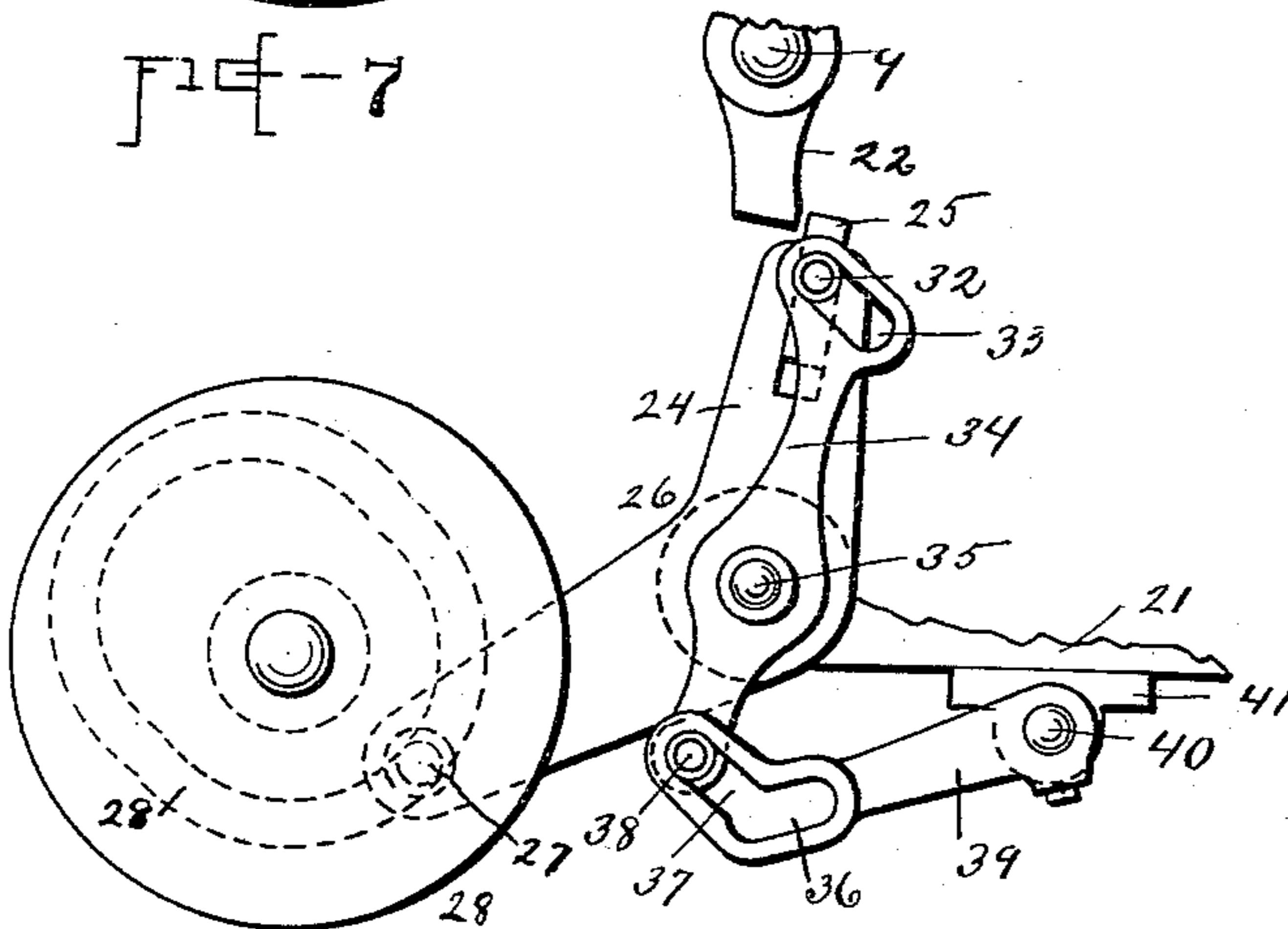


Fig. 8

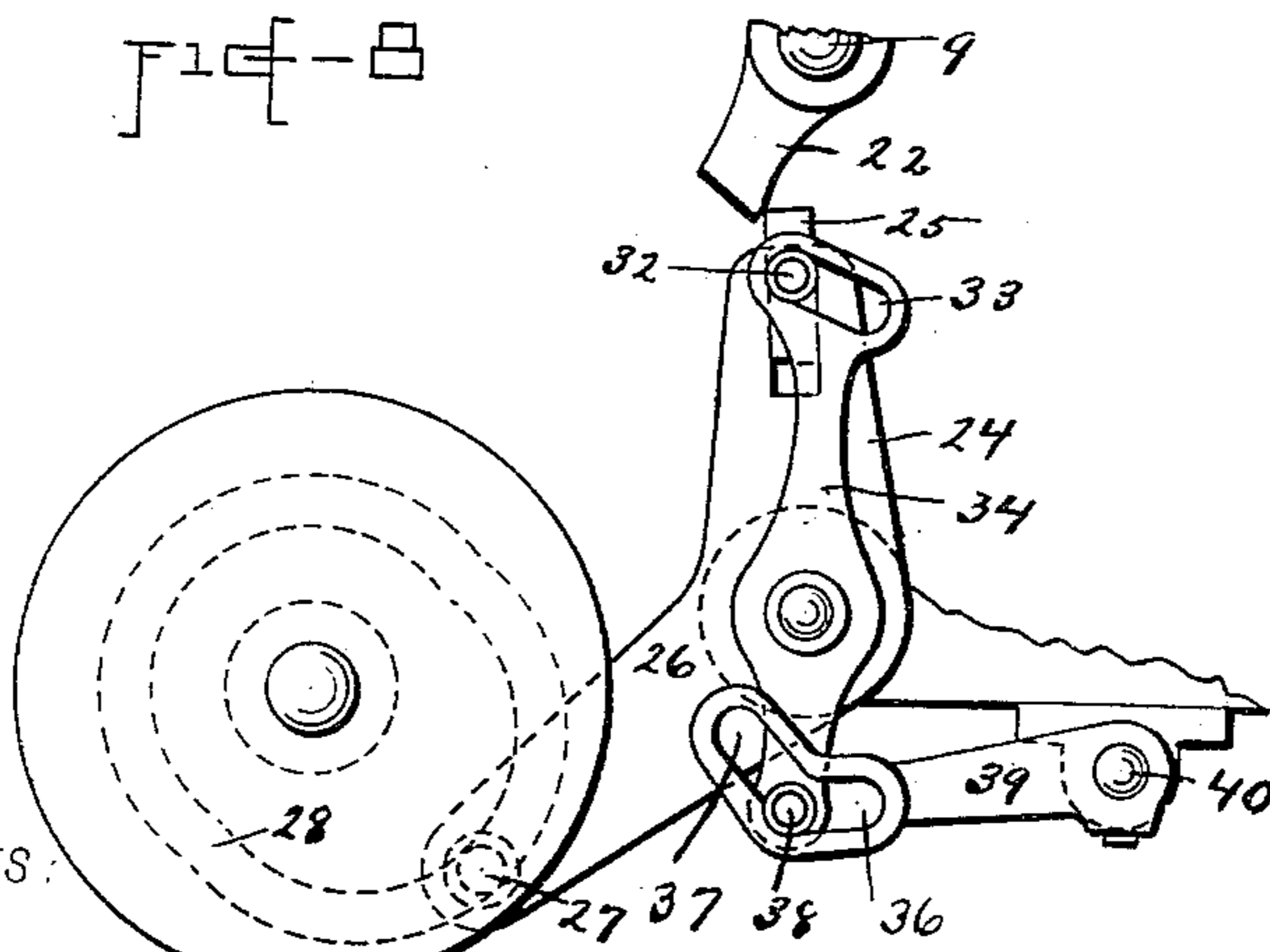


Fig. 9

WITNESSES:

Chester Higgins
B. M. Scott

Herbert E. Hawes
INVENTOR

BY *Charles H. Jones*
ATTORNEY.

UNITED STATES PATENT OFFICE.

HERBERT E. HAWES, OF NEW YORK, N. Y., ASSIGNOR TO COLBY & CO.,
OF SAME PLACE.

BUTTONHOLE-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 620,706, dated March 7, 1899.

Application filed July 29, 1897. Serial No. 646,318. (No model.)

To all whom it may concern:

Be it known that I, HERBERT E. HAWES, a citizen of the United States, residing in the city of New York, (Brooklyn,) county of Kings, and State of New York, have invented a new and useful Improvement in Buttonhole-Sewing Machines; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention is in the nature of an automatic single-stroke buttonhole-cutting mechanism for buttonhole-sewing machines, and is particularly adapted to multiple buttonhole-sewing machines of the kind illustrated in Letters Patent No. 363,678, dated May 24, 1887, and owned by Colby & Co., of Brooklyn, New York, in Letters Patent No. 441,058, granted to Thomas E. Colby November 18, 1890, and in a pending application for patent filed by me, Serial No. 618,804. The peculiar adaptability of the invention to this purpose is largely due to its forming a simple, powerful, and efficient means for automatically actuating the several buttonhole-cutters of the multiple machine at the same instant and at a predetermined time with respect to the stitching of the buttonholes.

I shall describe in detail the mode in which I reduced the invention to practice, referring by numbers to the accompanying drawings, and then point out the novel features of the invention in the claims.

Figure 1 of the drawings represents in side elevation the necessary parts of a multiple buttonhole sewing and cutting machine in which I have reduced my invention to practice. Fig. 2 is a front elevation of the same, showing two of the component sewing and cutting mechanisms. Fig. 3 is a plan view, partly in section, on the line 3-3, Fig. 2. Figs. 4, 5, 6, 7, 8, and 9 are detail views showing the construction and operation of parts hereinafter referred to.

In the drawings, 1 denotes the frame of a multiple buttonhole-sewing machine of the kind before referred to. 2 denotes the needle of each of the component "lock-stitch" sewing mechanisms, of which there are actually eight in the machine I constructed; 3, the shuttles; 4, the needle and shuttle actuating shafts; 5, the common driving-shaft geared to

all the shafts 4; 6, the several work-clamps; 7, the multiple work-clamp carrier, substantially as described in Letters Patent No. 441,058 and in the application, Serial No. 618,804, before referred to; 8, the buttonhole-cutters, and 9 the multiple-cutter-actuating rock-shaft, substantially as described in said application, Serial No. 618,804.

The multiple work-clamp carrier 7 is given the buttonhole-feed motion through the reciprocating guide-plates 10, 11, and 12 from a ratchet-wheel 13 on a shaft 14, substantially as described in the said Letters Patent No. 441,058, I in this machine actuating the ratchet-wheel 13 intermittently by pawls 15, carried by a spring-retained lever 16, pivoted on the shaft 14 and having its end 17 actuated by a cam 18 on a shaft 23, revolving in unison with the shaft 5, as hereinafter described, the lower clamp-actuating guide-plate 12 being vibrated to form the stitches by a link 19, as described in said Patent No. 441,058.

I effect the operation of the multiple-cutter-actuating shaft 9 and the simultaneous depression of the cutters 8 at a predetermined time with respect to the stitching of the buttonholes as follows, the cutters 8 being retained in and returned to their normal elevated position by a spring 20, connecting the shaft 9 with the frame of the machine: The ends of the shaft 9 are mounted to rock in fixed bearings erected on the frame of the machine, one of said bearings 21 only being shown in the drawings, and on the end of the shaft 9 shown is fixed a short strong operating-arm 22. The arm 22 is arranged to be actuated by the arm 24 of an elbow-lever 26, when a bolt 25, mounted to slide thereon, is projected, as shown in Figs. 8 and 9, but is not affected by said arm 24 when the bolt 25 is retracted, as shown in Figs. 1 and 7. The elbow-lever 26 is pivoted to the frame-bearing 21, and its lower end carries a cam-follower 27, which, with the lever 26, is rocked at each stroke of the needles 2 by a cam 28, fixed on the shaft 23, which is revolved from and in unison with the driving-shaft 5 through the connecting gear-wheels 29, 30, and 31.

To project and retract the bolt 25, to it is attached a roller-pin 32, which rides in a cam-

slot 33, on one end of a lever 34, which is pivoted to the bearing 21 and has on its other end a roller-pin 38, which rides in two communicating slots 36 and 37, meeting at an angle formed in the end of an arm 39, fixed to a horizontal rock-shaft 40. The rock-shaft 40 is mounted on bearings on the frame 1 and carries on its other end a vertically-swinging arm 43, on which is fixed adjustably a cam-piece 44. The cam-piece 44 is normally held in the path of a reverse cam-piece 45 on an arm 46, forming a cutter-controller fixed to and rotating with the shaft 14 of the stitch-feed ratchet-wheel 13, and when struck by the cam-piece 45 is momentarily elevated thereby, as shown in Fig. 6. I arrange the cam-pieces 44 and 45 to engage each other as the buttonhole-stitching is completed. Prior to that the bolt-actuating parts are in the relation shown in Fig. 7, the pin 38 riding in the slot 36 as the arm 24 is rocked by the cam 28 and the bolt 25 being retracted so as not to affect the cutter-actuating shaft 9. As the cam-pieces 44 and 45 coact the arm 43 is temporarily raised thereby, the arm 39 depressed, as shown in Fig. 8, the pin 38 moved from the slot 36 to the farther end of the cam-slot 37, the lever 34 rocked, and the bolt 25 projected thereby, so that as the cam 28 revolves and rocks the lever 26 the bolt strikes the cutter-actuating arm 22 and depresses all the buttonhole-cutters. As the cam-piece 45 immediately passes the cam-piece 44 the arm 39 is immediately raised again after its depression to the position shown in Fig. 9; but the bolt 25 is held projected by the lever 34, as shown in said figure, by the action of the cam 28 on the lever 26 until the stroke of the cutters is completed, when they are raised again by the spring 20, and the cam rocks the lever 26 reversely and retracts the bolt 25 to the position shown in Fig. 7, so that the next stroke of the lever 26 will not affect the cutters. The exactly simultaneous depression of all the cutters is thus accomplished during a single stroke of the needles at the proper time with respect to the buttonhole-stitching, and a second stroke of the cutters is positively avoided.

I claim as my invention—

1. The combination, with a plurality of co-operating buttonhole-sewing mechanisms, including a buttonhole-feed mechanism, a plurality of buttonhole-cutters, a rock-shaft extending across the several sewing mechanisms, and actuating connections between the rock-shaft and the several cutters, of a cam operating in harmony with the several sewing mechanisms, a cutter-controller moving in harmony with the buttonhole-feed mechanism, and operating connections whereby the cutter-controller causes the cam to temporarily actuate the multiple-cutter-actuating rock-shaft.

2. The combination, with a buttonhole-sewing mechanism, a buttonhole-cutter and cutter-actuating connections, of a lever carrying an extensible bolt or part, a cam continually reciprocating said lever, a cutter-controller, and operating connections whereby the cutter-controller causes the bolt or part to be projected temporarily into range of the cutter-actuating connections.

3. The combination, with a buttonhole-sewing mechanism, a buttonhole-cutter and cutter-actuating connections, of a lever carrying an extensible bolt to be projected into range of the cutter-actuating connections, a cam reciprocating said lever, a lever having a cam to extend the bolt, a cutter-controller, and operating connections whereby the cutter-controller operates the bolt-extending cam-lever.

4. The combination, with a buttonhole-sewing mechanism, a buttonhole-cutter and cutter-actuating connections, of a lever carrying an extensible bolt to be projected into range of the cutter-actuating connections, a cam reciprocating said lever, a lever having a cam to extend the bolt and an operating-pin, a lever having a slot in which said pin normally rides and a cam-slot communicating therewith to actuate said pin as well as the bolt-extending lever, and a cutter-controller temporarily operating the last said lever.

In testimony whereof I have hereunto set my hand the 5th day of March, 1897.

HERBERT E. HAWES.

In presence of—

FRANCIS E. ROGERS,
GEORGE E. ROGERS.