

No. 737,366.

PATENTED AUG. 25, 1903.

J. DIEHL.  
TAKE-UP FOR SEWING MACHINES.

APPLICATION FILED MAY 1, 1899.

NO MODEL.

3 SHEETS—SHEET 1.

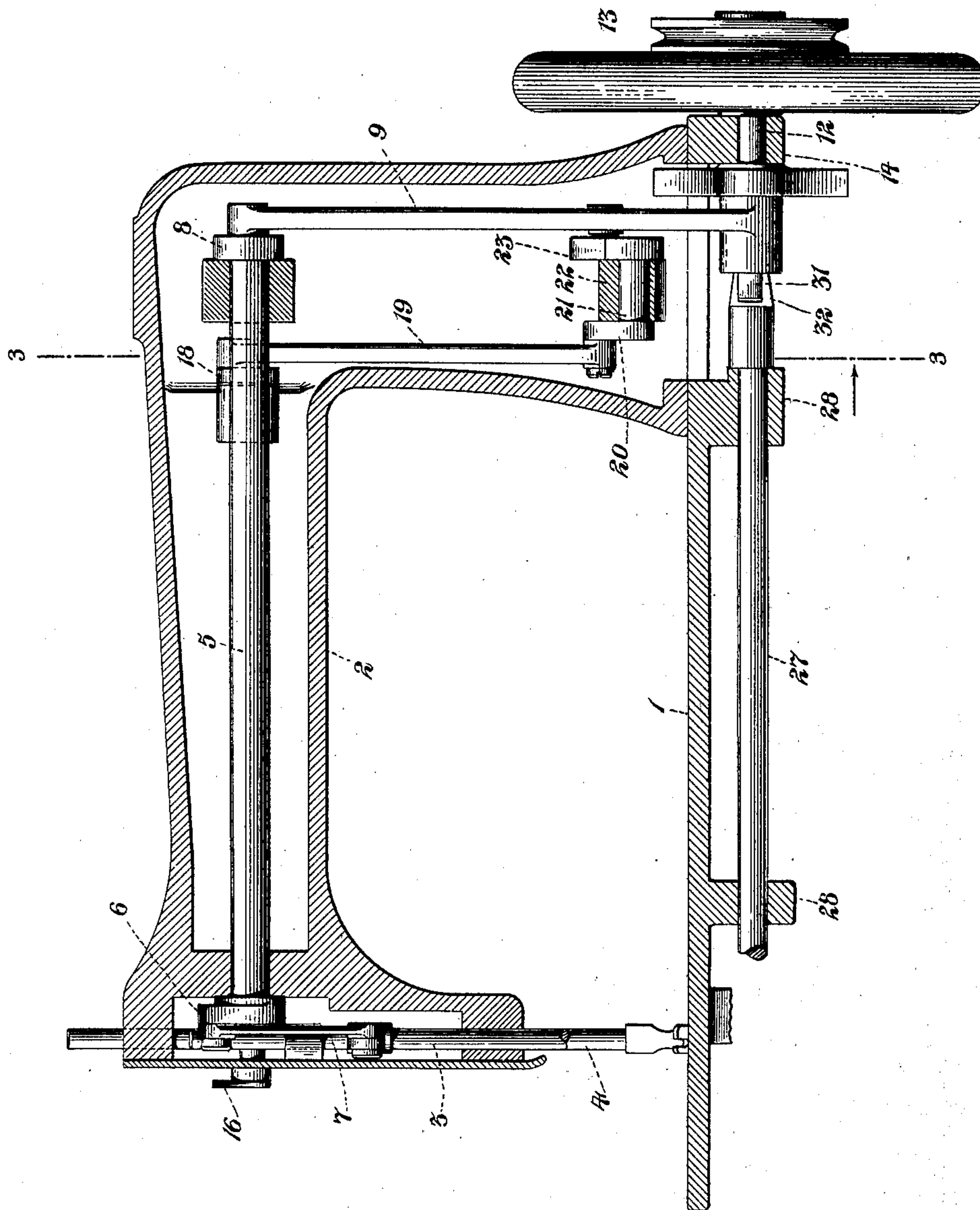


Fig. 1.

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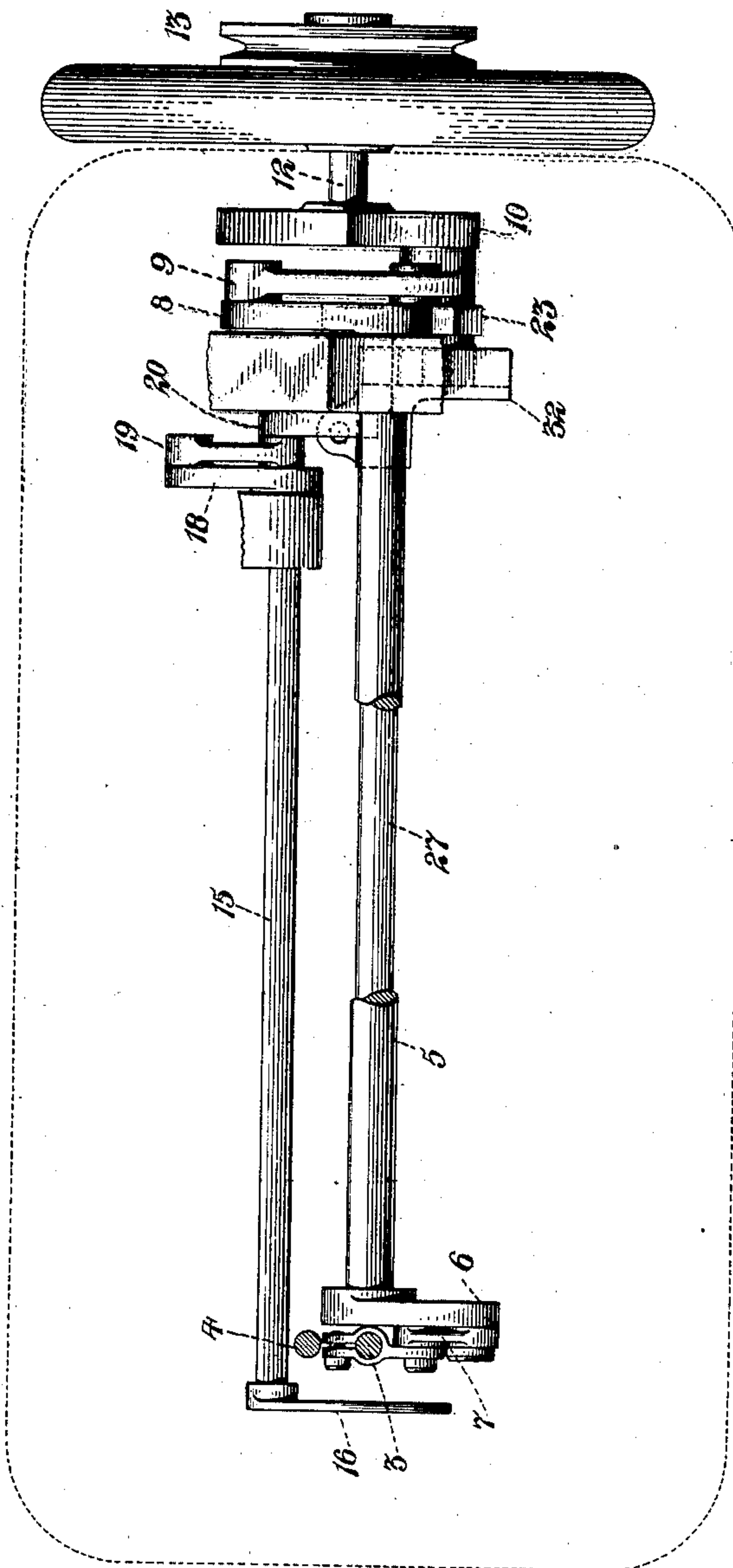
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3 SHEETS—SHEET 2.

Fig. 2.



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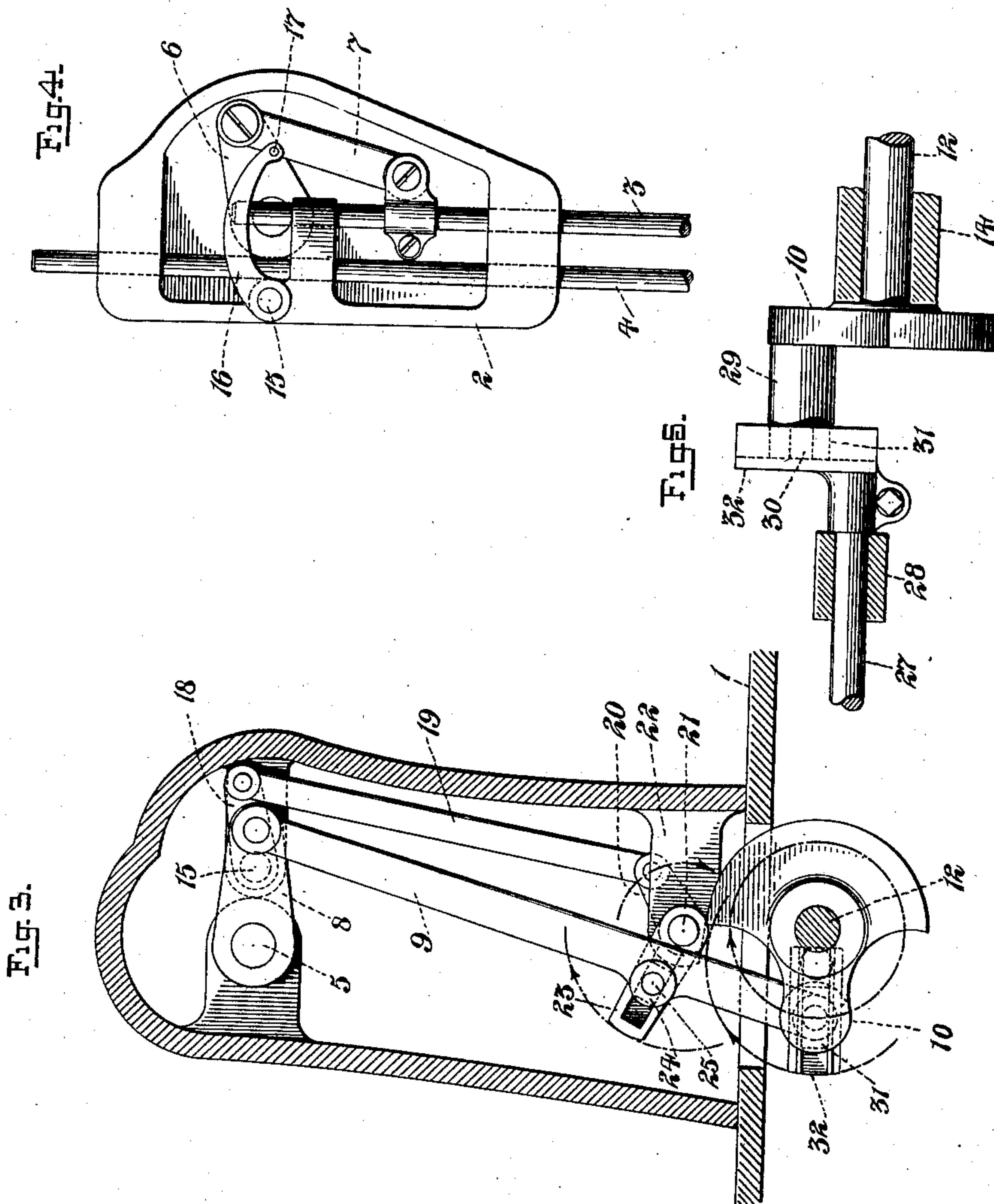
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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

JACOB DIEHL, OF CLEVELAND, OHIO, ASSIGNOR TO THE STANDARD SEWING MACHINE COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

## TAKE-UP FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 737,366, dated August 25, 1903.

Application filed May 1, 1899. Serial No. 715,107. (No model.)

*To all whom it may concern:*

Be it known that I, JACOB DIEHL, a citizen of the United States, residing at Cleveland, Cuyahoga county, State of Ohio, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification, reference being had to the accompanying drawings, forming part thereof.

My invention relates to sewing-machines, and has for its object to improve the stitch-forming mechanism thereof so as to insure its light and easy running at a very high rate of speed. This object I secure by means of the novel construction and combination of parts as hereinafter set forth in detail and pointed out in the claims.

Referring to the drawings, Figure 1 is a side elevation of so much of a complete sewing-machine as is necessary to illustrate my invention, with the frame in section. Fig. 2 is a plan view of the stitch-forming mechanism with the head or frame removed, certain of the parts and bearings being broken away. Fig. 3 is a vertical section of the machine through line 3 3 of Fig. 1. Fig. 4 is a front end view of the arm of the machine with the face-plate removed and the needle and presser-bars partly broken away, and Fig. 5 is an enlarged detail view showing the connection between the main driving-shaft and the looper-shaft.

To explain in detail, 1 represents the bed-plate of the machine, 2 the overhanging arm thereof, and 3 and 4 the needle and presser bars, respectively.

A horizontally - arranged rock-shaft 5, mounted in suitable bearings in the arm 2, is provided with a crank-arm 6 at its forward end, which is operatively connected with the needle-bar through the medium of a pitman 7 and adjacent to its opposite end is provided with a second crank-arm 8, which is operatively connected through the medium of a pitman 9 with a crank 10, carried by the main rotating driving-shaft 12. Rotation of the latter communicates a vertical movement to the pitman 9, and thereby a like movement to the needle-bar through the medium of the rock-shaft 5 and its connections, as described. The driving-shaft 12, having a pulley 13 mounted thereon, is supported and has its

bearing, as herein shown, in a lug 14 on the under side of the bed-plate 1.

A second rock-shaft 15, also mounted in suitable bearings in the arm 2, is provided at its front end with a fixed take-up arm 16, which, as shown, is located and adapted to operate in a position at the front side of the face-plate of the machine, the same being provided with an eye 17 to receive the thread therethrough. Adjacent to its rear end the rock-shaft 15 is provided with a crank-arm 18, which is operatively connected through the medium of a pitman 19 with the crank-arm 20 of a short rotating shaft 21, the latter being supported and having its bearing in a lug 22, formed on the inner side of the frame 2, as more clearly shown in Figs. 1 and 3. This shaft 21, termed the "take-up differential shaft," is operated from the pitman 9 to communicate the desired differential or variable movement to the take-up, the same being provided with a grooved crank-arm 23, having a sliding block 24, which is engaged by a pin 25 on the pitman 9, entering an opening in the same.

As the pitman 9 is operated by the rotating-crank 10 the pin 25 carried thereby is caused to move in a substantially elliptical but flat-sided path about the axis of the shaft 21, and so cause the connecting-block 24 to slide back and forth in the grooved crank-arm 23, whereby a fast and slow or differential movement of variable angular velocity is communicated to the shaft 21, and thereby to the connecting take-up 16, the differential or variable speed of said shaft 21 being such as to cause the latter to have a quick upward movement to draw up and tighten the stitch after the thread-loop has been cast off by the looper and thereafter to move downward slowly, so as to control and prevent undue slack thread until such time as the looper has passed through the next loop thrown out by the needle and casts off the same, when it again quickly operates to draw up and tighten the stitch, as before stated.

The looper driving-shaft 27, mounted in suitable bearings 28 on the under side of the bed-plate with its axis eccentric to the axis of the main driving-shaft 12, is operated



to drive the looper (not shown in the drawings) in proper time with the other parts of the stitching mechanism from the driving-crank 10, the crank-pin 29 on the latter with which the pitman 9 connects having a reduced end 30, which engages with a sliding block 31, located in the grooved crank-arm 32 on the end of the said shaft 27, and communicates the desired differential rotary movement to the latter.

Having thus set forth my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a sewing-machine, the combination, with the head or frame, of a rock-shaft having a take-up arm and a crank, a differential or variable speed rotating shaft having two cranks, one being operatively connected with said rock-shaft crank, and an actuating part movable in a substantially elliptical path and engaging the second crank of said differential shaft, for the purpose set forth.

2. In a sewing-machine, the combination, with the head, of a rock-shaft having a take-up arm and a crank, a differential or variable speed rotating shaft having two cranks, one being operatively connected with said rock-

shaft crank and the other being provided with a groove, a rotating driving-shaft, and means operated from the latter having a sliding connection with said grooved crank and imparting a rotation of variable angular velocity thereto, the said means being moved in a substantially elliptical but flat-sided path, for the purpose set forth.

3. In a sewing-machine, the combination, with the head, of a rotating driving-shaft having a crank, a rock-shaft having a crank, one of said cranks being of different length than the other, a pitman connecting the said cranks, a take-up rock-shaft having a take-up arm and a crank, a differential or variable speed rotating shaft having two cranks, one being operatively connected with said take-up rock-shaft crank, and means carried by said pitman in a substantially elliptical but flat-sided path, the said means having a sliding connection with the second crank of said differential shaft, for the purpose set forth.

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Witnesses:

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