

No. 765,634.

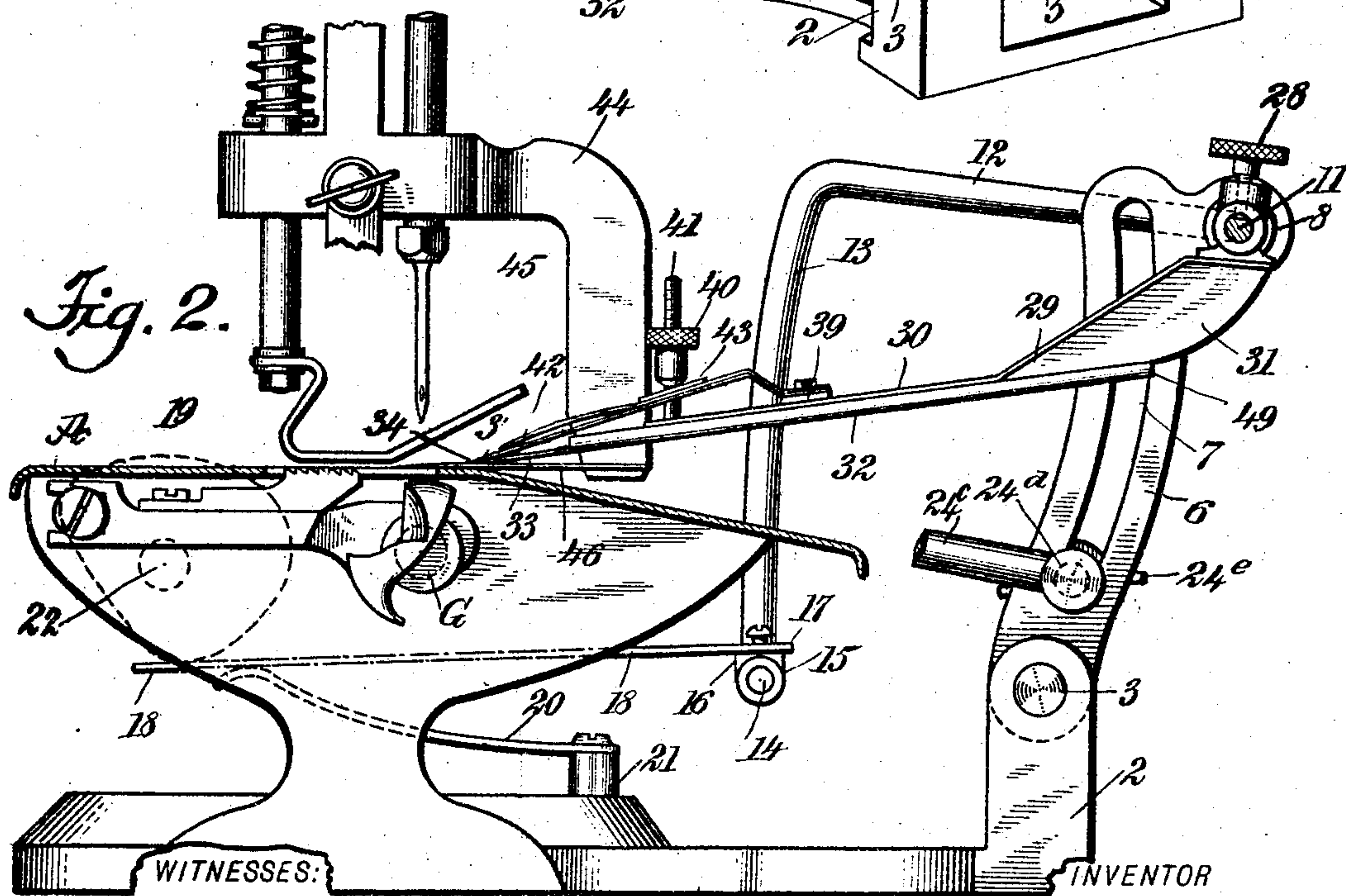
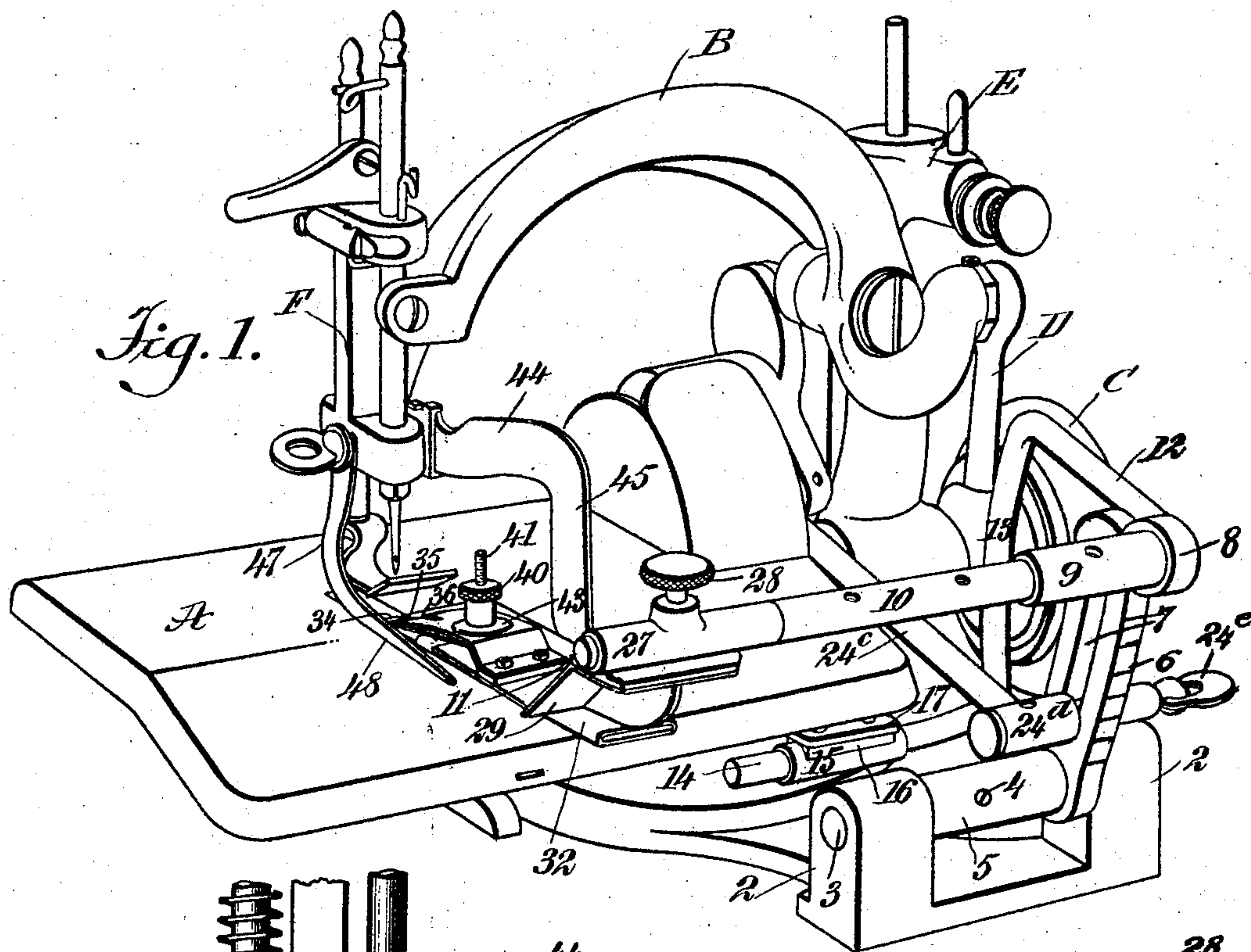
PATENTED JULY 19, 1904.

O. RICKENMANN.  
PLAITING ATTACHMENT FOR SEWING MACHINES.

APPLICATION FILED DEC. 10, 1902.

NO MODEL.

6 SHEETS—SHEET 1.



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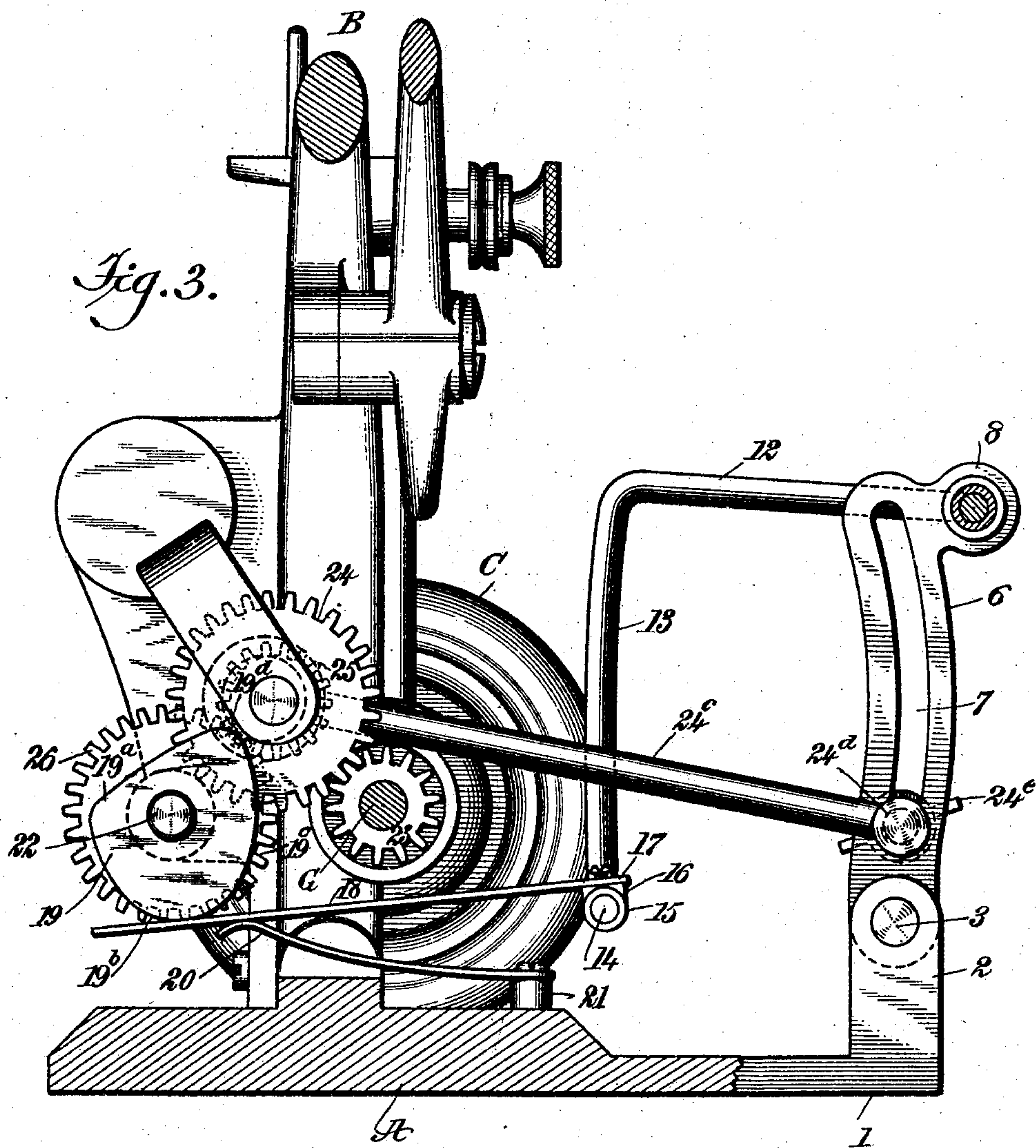
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6 SHEETS—SHEET 2.



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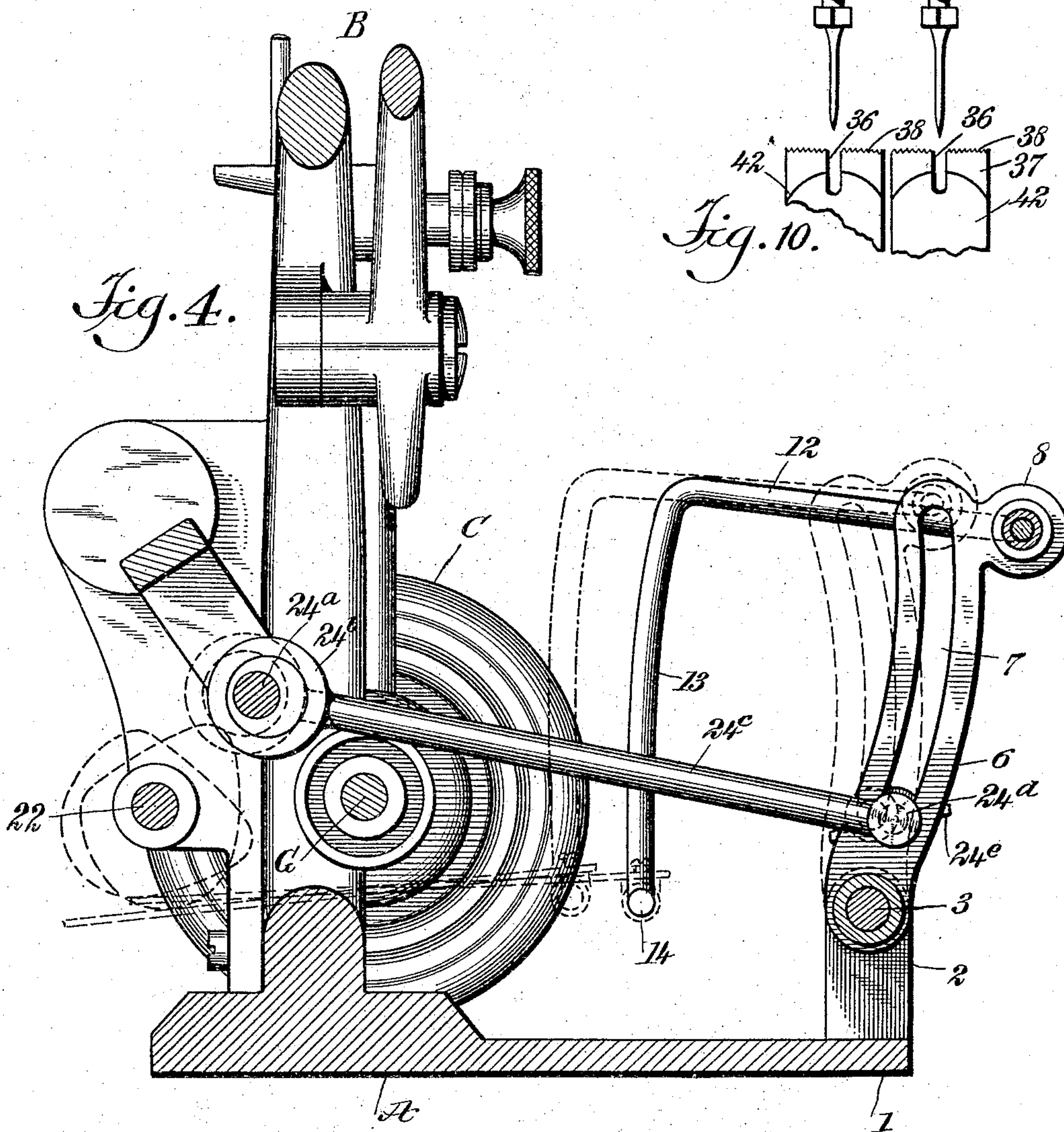
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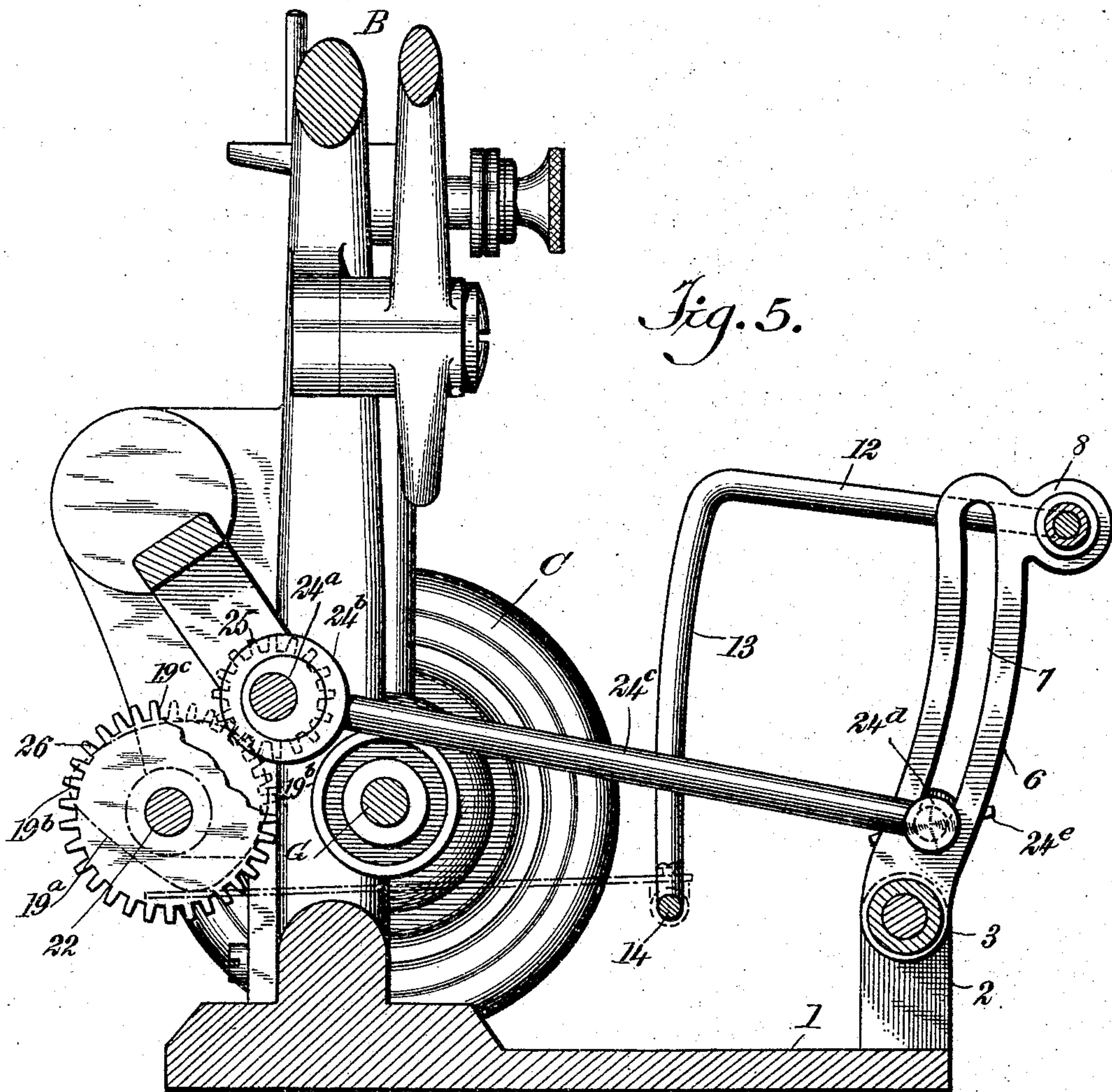
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6 SHEETS—SHEET 4.



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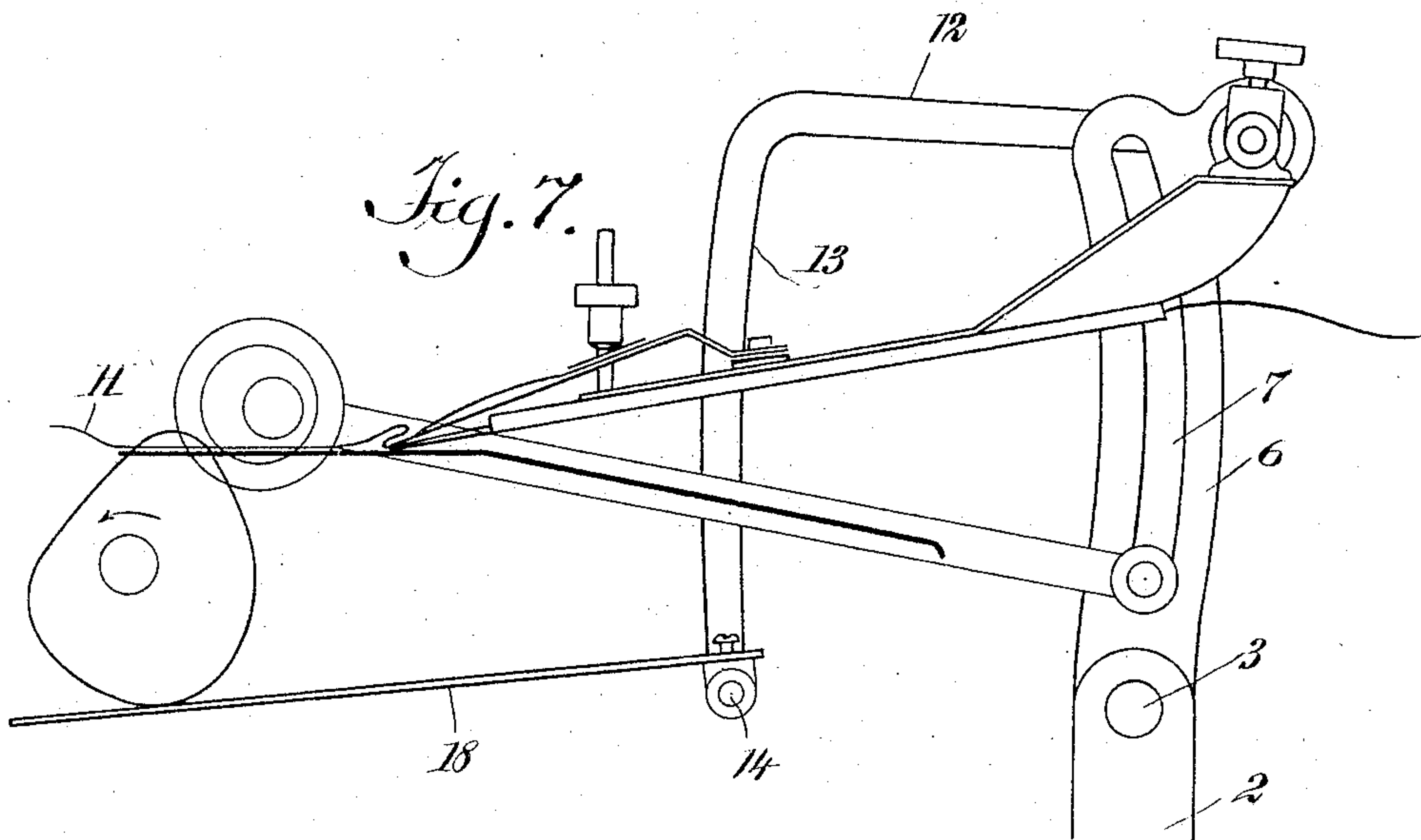
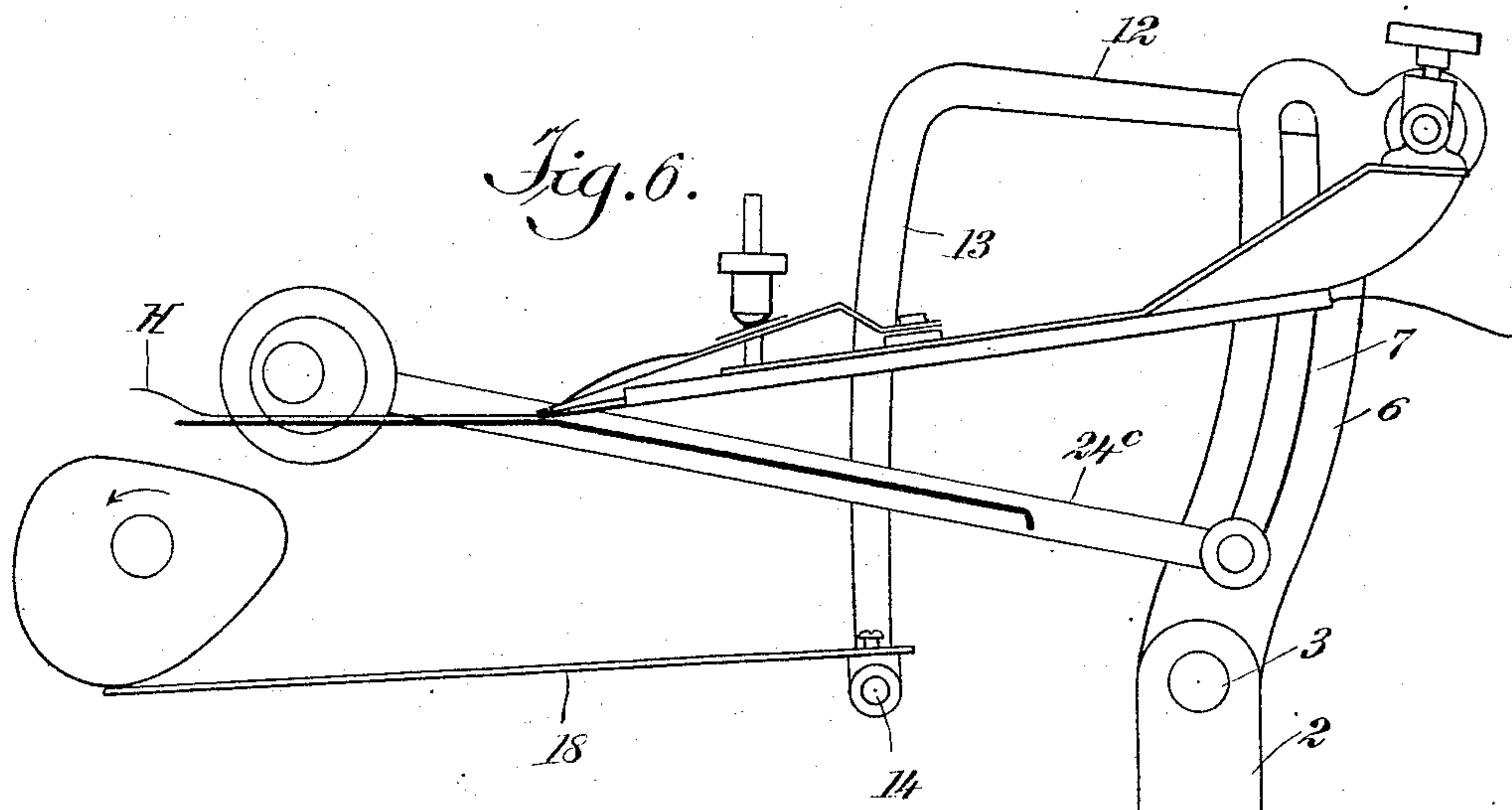
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6 SHEETS—SHEET 5.



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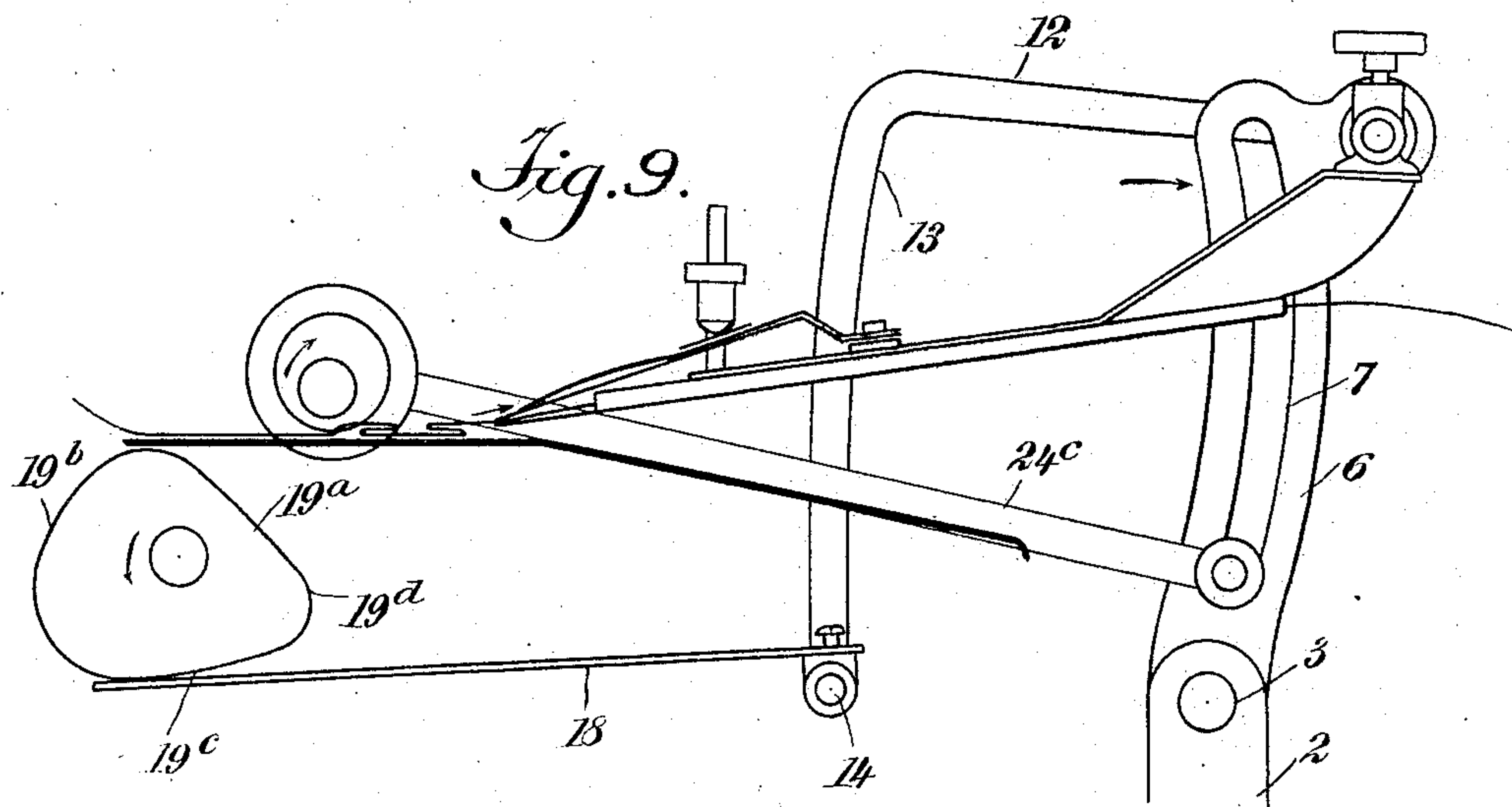
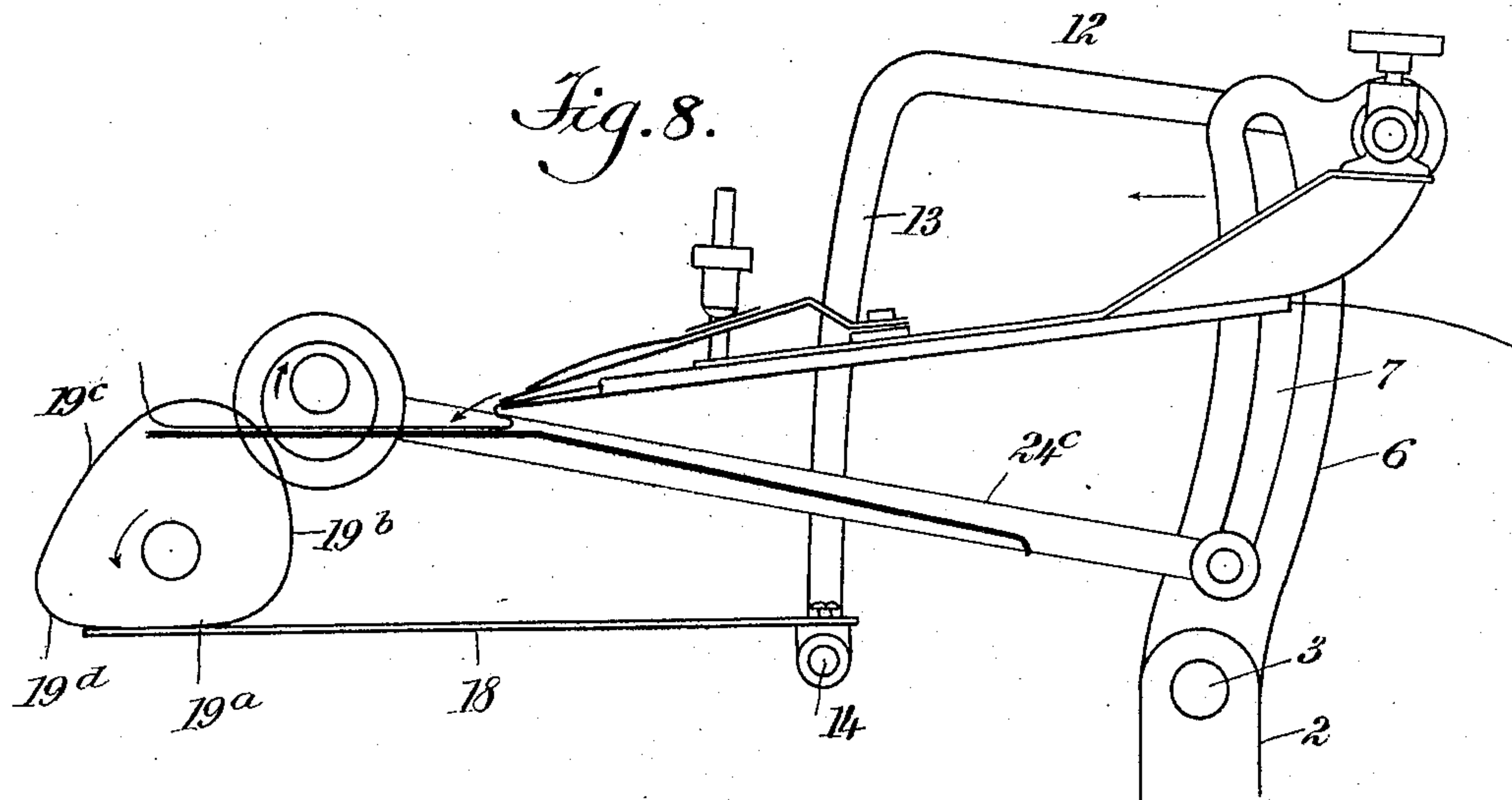
O. RICKENMANN.

PLAITING ATTACHMENT FOR SEWING MACHINES.

APPLICATION FILED DEC. 10, 1902.

NO MODEL.

6 SHEETS—SHEET 6.



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# UNITED STATES PATENT OFFICE.

OTTO RICKENMANN, OF NEW YORK, N. Y., ASSIGNOR TO JOSEPH FRANKENTHALER, OF NEW YORK, N. Y.

## PLAITING ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 765,634, dated July 19, 1904.

Application filed December 10, 1902. Serial No. 134,649. (No model.)

*To all whom it may concern:*

Be it known that I, OTTO RICKENMANN, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented new and useful Improvements in Plaiting Attachments for Sewing-Machines, of which the following is a full, clear, and exact description.

The present invention relates to certain novel and useful improvements in attachments for sewing-machines, and has particular application to a device of the class described for forming plaits, ruffles, or the like.

In carrying out the present invention I have in view the construction of an attachment which shall feed to the needle or sewing mechanism of the machine a strip or tape of suitable material and shall automatically form the same into plaits or ruffles, the present invention being especially designed for the making of plaits of the character commonly known as "box-plaits."

A further object of the present invention is to construct a plaiting attachment through the assistance of which the material may be readily plaited and fed to the needle or sewing mechanism.

Still another object of the invention is to so construct and mount my attachment that the material having the plaits formed therein may be stitched on a central longitudinal line to the basic goods or fabric.

Another object of the invention is to provide a mechanism which will impart to the plaiting device a rocking movement, the path of travel of the device in its rocking movement being limited through certain means, as will hereinafter appear.

It is also an object of my invention to provide a guiding attachment whereby a row of plaits which has been previously formed will be separated from plaits undergoing the process of formation under the needle of the machine, thus insuring regularity of the arrangement of the rows of plaits by preserving the proper feed of the strip of material.

With these and other objects of a similar

nature in view the invention consists in the peculiar construction, combination, and arrangement of parts, as will be hereinafter described in this specification, delineated in the accompanying drawings, and set forth in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view of a sewing-machine of an ordinary or well-known type having my improvement applied thereto. Fig. 2 is an end elevation of the same, partly in section and showing the relative arrangement of the parts of my attachment. Fig. 3 is a view in end elevation, partly in section, showing the mounting and arrangement of the driving-gear and the cam mechanism for imparting motion to the plaiter. Fig. 4 is a view in end elevation illustrating the mounting of the eccentric-shaft for rocking the plaiter-support and showing in dotted and full lines, approximately, the nearest and farthest points of travel attained by the eccentric-shaft and its connected parts in their rocking movement. Fig. 5 is a view in end elevation, partly in section, showing the arrangement of the gearing for imparting motion from the shaft of the eccentric to the cam-shaft, the eccentric and its connected parts being at their farthest limit of travel from the machine. Fig. 6 is a diagrammatic view illustrating the initial movement of the plaiter as it starts to travel toward the sewing mechanism, the plaiter and its rocking parts being at the limit of the farthest movement of said sewing mechanism. Fig. 7 is a similar view showing the plaiter after it has carried the material to a point in the path of the needle. Fig. 8 is a like view of the machine after the plaiter has returned from the position shown in Fig. 8 and has been elevated by the cam mechanism and is starting to form the second fold in the material. Fig. 9 is also a diagrammatic view illustrating the position of the plaiter after the second fold has been made and the said plaiter is about to assume the position illus-



trated in Fig. 6, and Fig. 10 is a detail view showing the jaws of the double-plaiter plates in conjunction with two needles.

Referring now to the accompanying drawings, forming a part of this specification, A designates the table or base of the sewing-machine of any well-known type, said base having mounted thereon the frame of the machine, which I shall designate as a whole by B. It is of course to be understood at the outset that my improvements may be applied to any particular form or type of sewing-machine. The one herein delineated is merely to illustrate the application of the invention. It will be seen that in addition to the frame B the machine is provided with the ordinary driving-wheel C, having its shaft extending horizontally longitudinally of the machine, the crank D, the standard E, and the sewing mechanism F; but, as above stated, these form no part of the present invention.

Extending forwardly of the base A and connected therewith is a frame 1, formed with the two vertically-extending standards 2 2, which standards are adapted to support the shaft 3, which is journaled therein. Mounted upon the aforesaid shaft 3 and connected therewith by means of a screw 4 is a sleeve 5, carrying at one end a vertically-arranged curved arm 6, which is preferably formed integral with the aforesaid sleeve, and said arm is provided with a longitudinally-extending segmental slot 7, the arm therefore having the appearance of a relatively large elongated link, as will be clearly seen by reference to the drawings. The extreme upper portion of this arm 6 is formed with an extension or lug 8, bored or apertured to form a bearing at one end for the rock shaft or bar of the attachment, which I will hereinafter describe in detail. This extension 8 has also preferably integral therewith a relatively long sleeve formed of an enlarged portion 9 and a reduced portion 10, the aforesaid shaft extending entirely through this casing or sleeve, as will be clearly seen in Fig. 1. The peculiar formation of the rock-shaft will be readily observed, comprising, as it does, the relatively long horizontally-disposed member 11, which extends entirely through the sleeve hereinbefore mentioned, and is then bent backwardly approximately at right angles, as at 12, is again bent downwardly to form the vertical member 13, and at a point below the main frame of the machine is again turned, as at 14, to lie in approximately the same parallel plane as the member 11. On the portion 14 of the shaft is secured a sleeve 15, provided with a raised flattened portion 16, adapted to support the enlarged end 17 of the flat spring 18, which spring 18 extends transversely beneath the frame or table of the machine to a point approximately near the rear end thereof, where it is adapted to be held in contact with an eccentric-cam 19 through

the medium of a second upwardly-pressing spring-arm 20, which is mounted upon a stud 21, secured to the base-frame of the machine. This cam 19 is carried by a shaft 22, which shaft is revolubly mounted in suitable bearings in the rear of the frame of the machine, and such shaft is turned or driven from the main shaft G of the machine through the medium of a train of gearing, as is clearly seen in Figs. 3 and 5, such train comprising a small gear-wheel 23, mounted upon said shaft G, which gear-wheel 23 meshes with a large pinion or gear-wheel 24, carrying at one side a smaller gear-wheel 25, which gear-wheel 25 in turn meshes with a large gear-wheel 26, rigid with the shaft 22, on which shaft, as hereinbefore stated, is secured the cam 19.

To the small shaft 24<sup>a</sup>, which carries the gears 24 and 25, hereinbefore mentioned, is eccentrically connected, as at 24<sup>b</sup>, one end of the connecting-rod 24<sup>c</sup>, the other end of the connecting-rod being keyed or connected, as at 24<sup>d</sup>, to the arm 6 through the medium of a screw-key 24<sup>e</sup>, passing through the slot 7 in said arm and seating in the end of the connecting-rod, the construction being such that the said eccentric connecting-rod may be held in any adjusted position longitudinally of the arm. It will therefore be evident that when the shaft 24<sup>a</sup> is turned the eccentric connecting-rod will be actuated and the arm 6 with the connected rock bar or shaft and the spring 18 will be rocked back and forth. It is further to be observed that the throw or outward movement of the arm and connected parts is limited. This will cause the movement of the plaiting devices (which are carried by the rock-bar and which I will hereinafter describe in detail) outward to be also adjusted—that is to say, will cause the same to move in relatively short or long paths, and consequently the plaits will be made narrow or wide, as desired.

The improved plaiter of the attachment is more clearly shown in Figs. 1 and 2 and comprises a top plate formed integral with a sleeve 27, said sleeve being removably mounted on the shaft 11 through the medium of a set-screw 28. The plate referred to comprises a relatively wide inclined portion 29 and a horizontally-disposed member 30. Mounted beneath this plate formed of the members 29 and 30 and connected therewith through the medium of a web 31 is the flat tubular guide 32, through which the strip of material to be plaited or ruffled is passed. This guide 32 is inclined somewhat downwardly and extends beyond the end of the portion 30 of the plate, and at the termination of the tubular portion of the guide the under face thereof is extended, as at 33, somewhat beyond the opening or mouth of the guide, and such extended portion, which is adapted to occupy a position approximately near the path of the movement



of the needle, is serrated or toothed at its extreme edge portion, as at 34, and is also provided with a slot 35, adapted to register with a similar slot 36, formed in a spring-tongue 37, which is also serrated at the front edge, as at 38. (See Fig. 10.) When the plates or tongues cross the path of travel of the needle, the latter passes through these slots. It will be observed by reference to the drawings that this spring-tongue 37 is connected with the portion 30 of the plate, as at 39, and is inclined downwardly, so as to be brought into bearing contact with the plate 33 through the medium of a screw-nut 40, carried by a stud 41, which extends upwardly from the portion 30 and through the tongue 37. A somewhat smaller spring-tongue 42 is mounted above the tongue 37, and a bearing-washer 43 is provided for the screw-nut 40. It will be evident that by this arrangement by adjusting the nut 40 upon the stud 41 the bearing contact of the tongue 37 upon the extension 33 may be limited or controlled to accommodate any thickness of material passing through the guide 32.

For the purpose of assisting in guiding and directing the material passing through the plaiter and permitting the stitching to run centrally longitudinally of the strip without folding the same I have provided a supplemental frame or guide comprising an arm of substantially L shape, as shown at 44. The vertical member 45 of the arm carries a relatively wide base-plate 46, which is adapted to extend in the path of the needle, such needle reciprocating through a slot formed in the edge of the plate. A second guide-shoe 47 may be attached to the opposite side of the needle from the guide 44, the horizontal portion 48 of such guide-shoe being slightly bent or curved inwardly. This guiding-shoe also assists in keeping separated the plaits that have been finished from those which are in the course of formation, thereby regulating the rows of plaits and preventing one from overlapping the other during the sewing operation. If desired, any suitable guide may also be attached near the entrance 49 of the tubular guide, whereby the material may be directed from a suitable roll into said guide.

From the above description, taken in connection with the accompanying drawings, the operation of the mechanism will be readily apparent.

When the main driving-shaft of the machine is rotated, through power applied to the drive-wheel C, the shaft 24<sup>a</sup> will be turned by the intermeshing gears 23 and 24 and the eccentric connecting-rod 24<sup>c</sup> will be actuated to rock the rocking bar and the arm. Power is also transmitted to the cam-shaft 22 through the meshing of the gear 25 with the gear 26, and the cam 19 is rotated.

The effect of the operation of the cam 19

upon the plaiting mechanism is clearly seen in Figs. 7, 8, 9, and 10. When the heel of the cam is in the position shown in Fig. 6, the clamping-points of the plaiter rest upon the broad plate of the guide 44 in approximately the position shown in Fig. 6—that is to say, at the farthest point of travel of the plaiter away from the needle—the cam revolving in the direction shown by the arrow and the braid or material, which I have designated as H, is presumed as being fed through the plaiter to the needle. As the cam continues its movement in the direction of the arrow and the broad portion or heel thereof bears downwardly upon the spring 18, as shown in Fig. 7, the plaiter-supporting means, which is being rocked forward by the eccentric-shaft, is forced slightly downward, and the material or strip H has the first loop formed therein, as is clearly shown in the aforesaid Fig. 7, the point of the plaiter and the loop lying directly in the path of the needle. The feeding mechanism of the sewing-machine of course continues to cause the strip to travel onward, and as the rock-shaft is carried in its retreating movement away from the needle the plaiter is also forced away from the needle. When the cam in its course of revolution reaches the position shown in Fig. 8—that is, with its flat face in contact with the spring 18—the spring moves upward to a position nearer to the shaft of the cam, and during its upward movement elevates the rock-shaft, and consequently the plaiter, to the position shown in Fig. 8. In this figure the formation of the second fold of the plait has just been started. The cam continuing to turn presses the spring downward, with the toe portion thereof, and thus carries the plaiter, with the material, downward once more and in toward the needle. The second loop, as shown in Fig. 9, is thus formed and the plaiting device is again rocked backward to assume the position shown in Fig. 6. This operation is then repeated, the needle moving centrally longitudinally of the tape and securing the plaits in proper position.

While I have herein shown and described one particular embodiment of my invention, it is of course to be understood that I do not wish to be considered as limiting myself to the precise details of construction illustrated, as there can be modifications and variations in some respects without departing from the essential features of the invention or sacrificing any of the advantages thereof.

The many advantages incident to a mechanism of the character embodied herein will immediately suggest themselves to those skilled in the art to which my invention appertains, so that it is unnecessary to recite the same here in detail. It will be observed, however, that with my attachment the rows or strips of plaiting may be sewed or stitched very



close together and may also be attached directly to the fabric without the necessity of employing a supplemental strip for the plaiting.

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

1. In a sewing-machine, a plaiting device formed of a main plate, a tubular guideway secured to said main plate, clamping-plates 10 mounted on the main plate, a screw-stud and nut for adjusting the plates to accommodate any thickness of material, and means for imparting a rocking movement to the plaiting device toward and from the needle of the machine, substantially as set forth.

2. The combination of a stitching device, a plaiter mounted adjacent thereto and movable relative to said stitching device, such plaiter comprising a main plate, a tubular guideway 20 secured to said main plate, clamping-plates mounted on said main plate, a stud carried by the main plate and passing through the clamping-plates and a nut for said stud whereby the clamping-plates may be adjusted relatively to the main plates, substantially as set forth.

3. The combination of a stitching device, a plaiter mounted adjacent to and movable relatively to the stitching device, such plaiter 30 comprising a main plate having an enlarged portion and a relatively long narrow portion, a tubular guideway connected with said plate and extending beyond the same at a point adjacent to the stitching device, a serrated extension formed at the end of the guideway, and adjustable clamping-plates mounted on the main plate above the guideway and its extension, substantially as set forth.

4. The combination with a main frame and 40 a stitching mechanism, of a pivoted rocking arm carried by the main frame, a driving-shaft for actuating said arm, an angular shaft having its end portions lying in approximately parallel planes, said shaft being mounted on and adapted to be moved backward and

forward by the rocking arm in its travel, plaiting devices carried by one of the parallel end portions of the angular shaft, a cam, and a spring carried by the second parallel end portions of the shaft, and moved by said cam 50 for raising and lowering the plaiting devices so that folds will be formed in the material being plaited, substantially as set forth.

5. The combination with a main frame and a stitching mechanism, of a rocking arm carried by said main frame, an angular shaft supported by and rocking with said arm, the end portions of said angular shaft extending approximately parallel relative to each other, a plaiter on one of the parallel end portions of 60 the angular shaft, a power-shaft journaled in the frame, a driving-shaft geared to the power-shaft, a cam-shaft geared to the driving-shaft, a cam mounted on the cam-shaft, an eccentric connecting-rod connecting the driving-shaft 65 with the rocking arm, whereby the latter with its angular shaft and the plaiting devices may be moved back and forward relative to the stitching mechanism when the power-shaft is actuated, and a spring connected with one of 70 the parallel end portions of the angular shaft and adapted to be normally held in contact with the cam, the construction being such that when the power-shaft is actuated the rocking arm will be moved backward and forward 75 relative to the stitching mechanism and the angular shaft with its plaiting devices will be raised or lowered at predetermined intervals relative to the movement of the stitching mechanism, whereby folds or plaits may be 80 formed in the material passing from the plaiting devices to the stitching mechanism, substantially as set forth.

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

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Witnesses:

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