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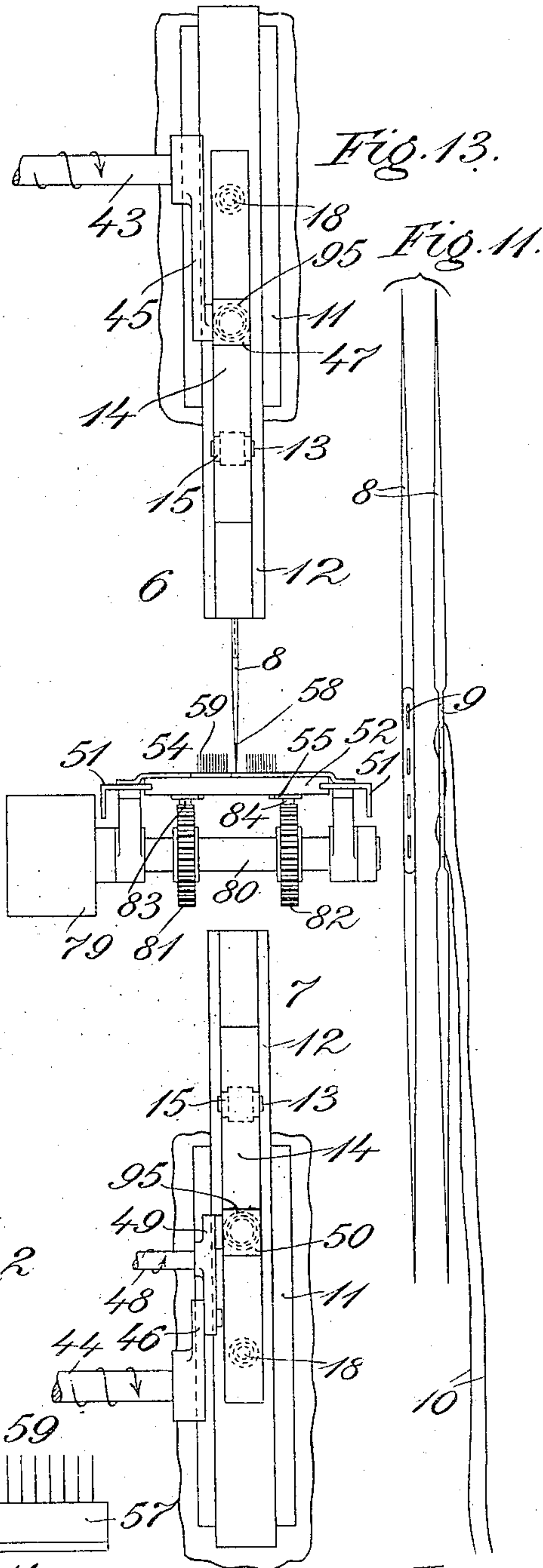
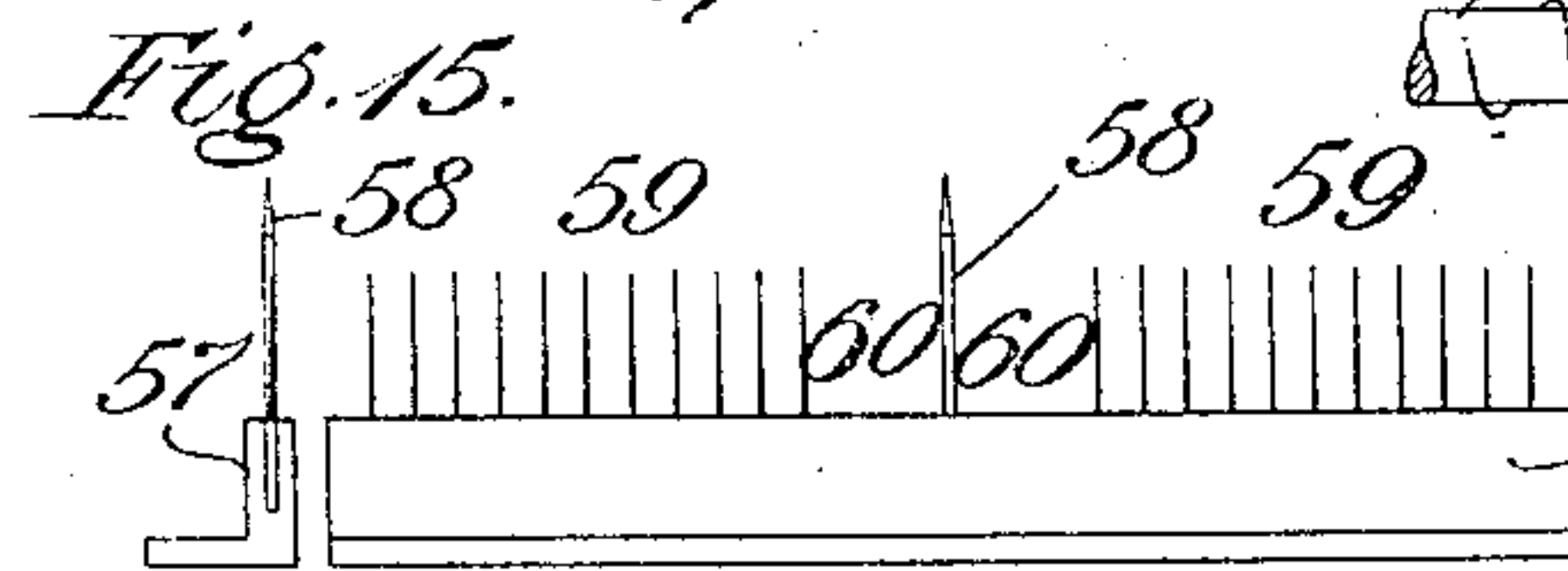
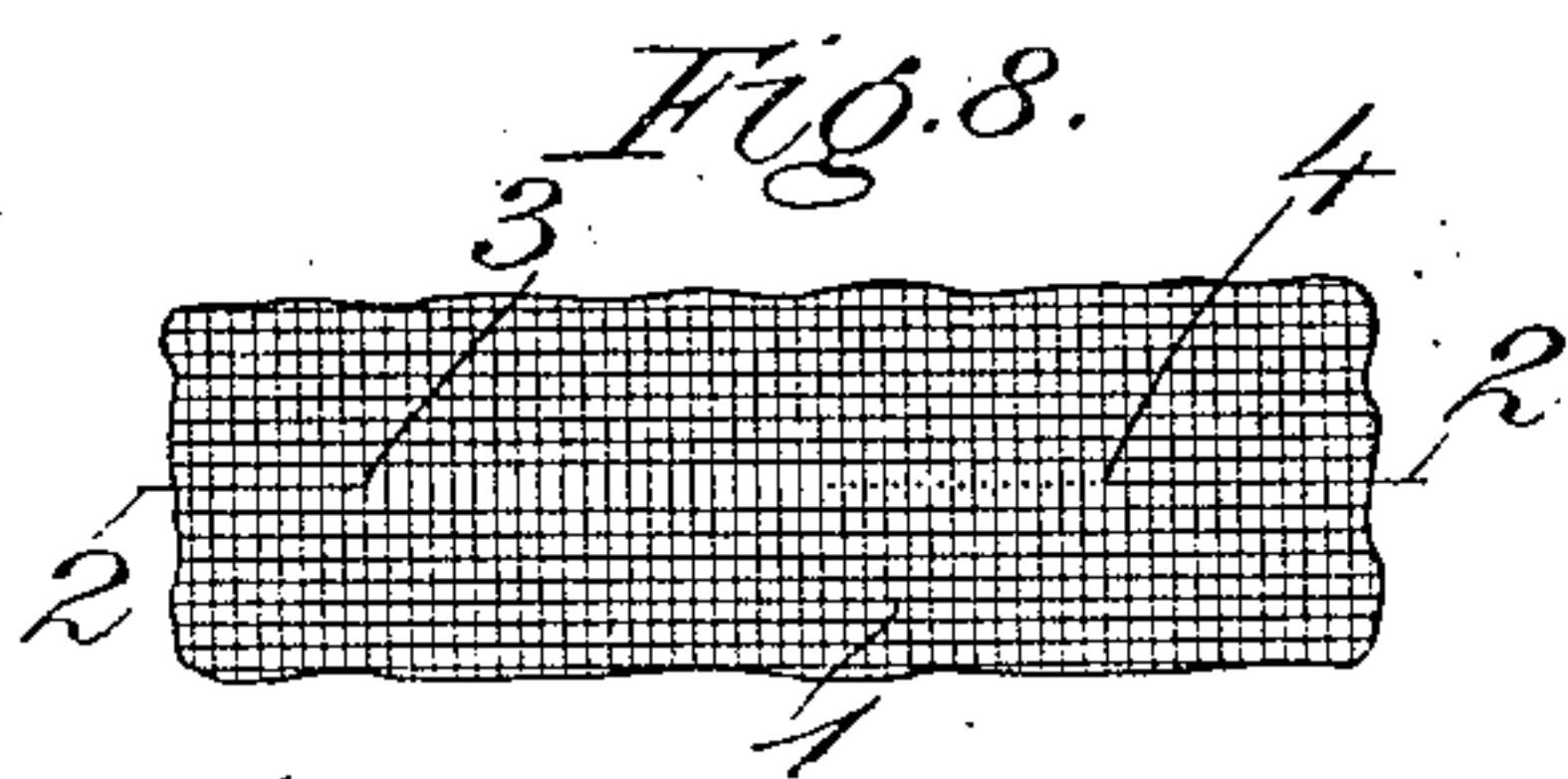
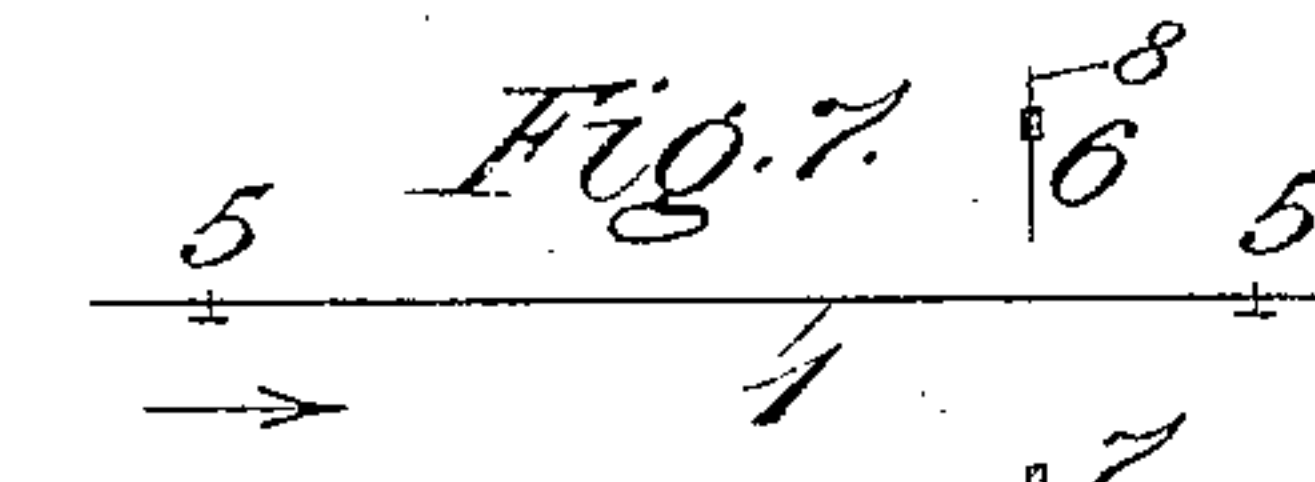
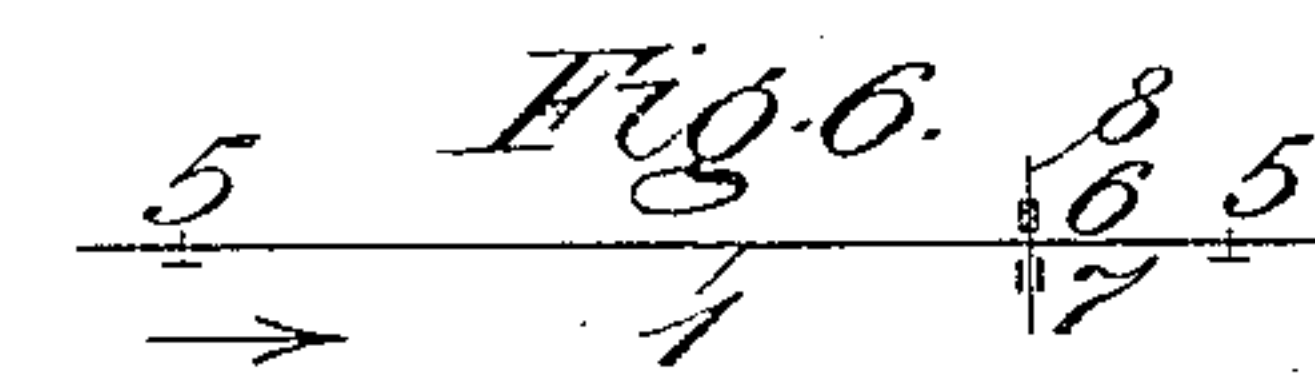
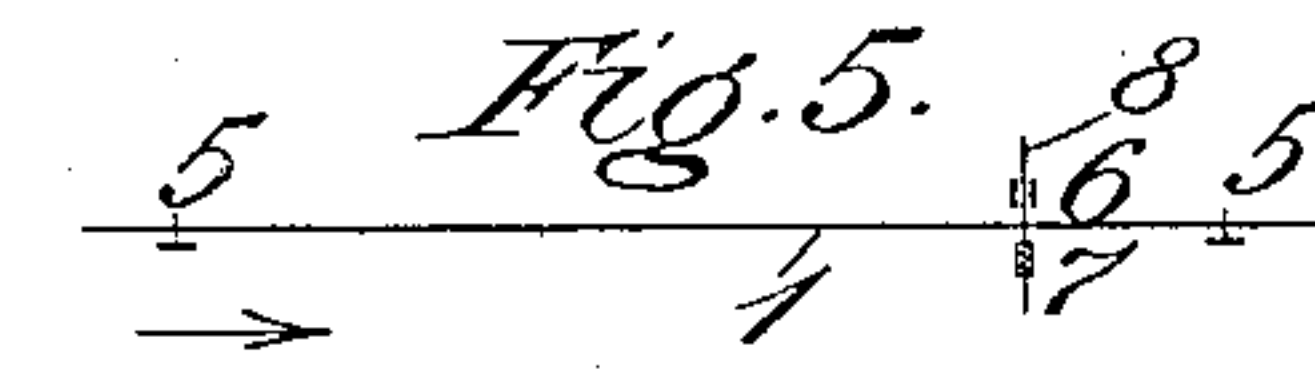
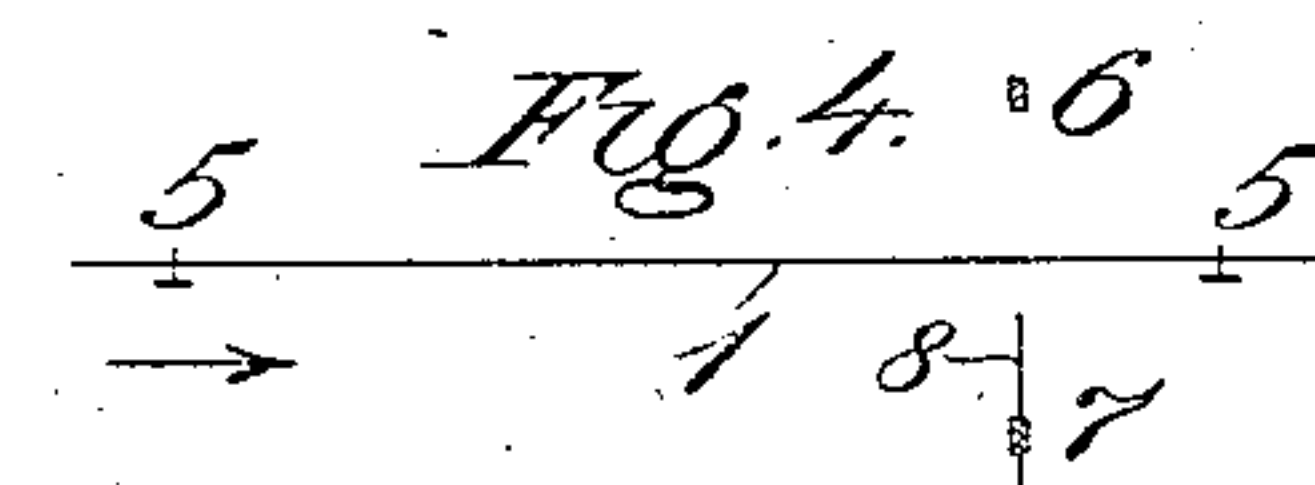
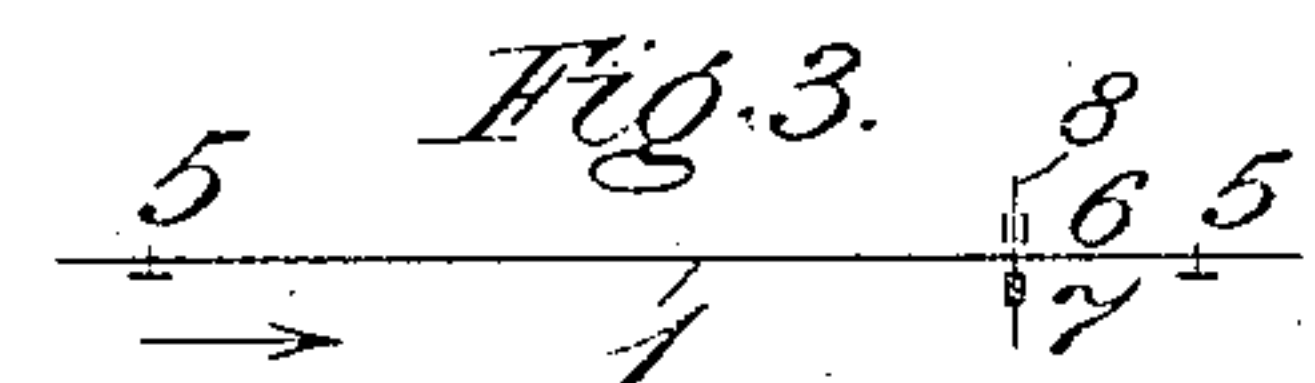
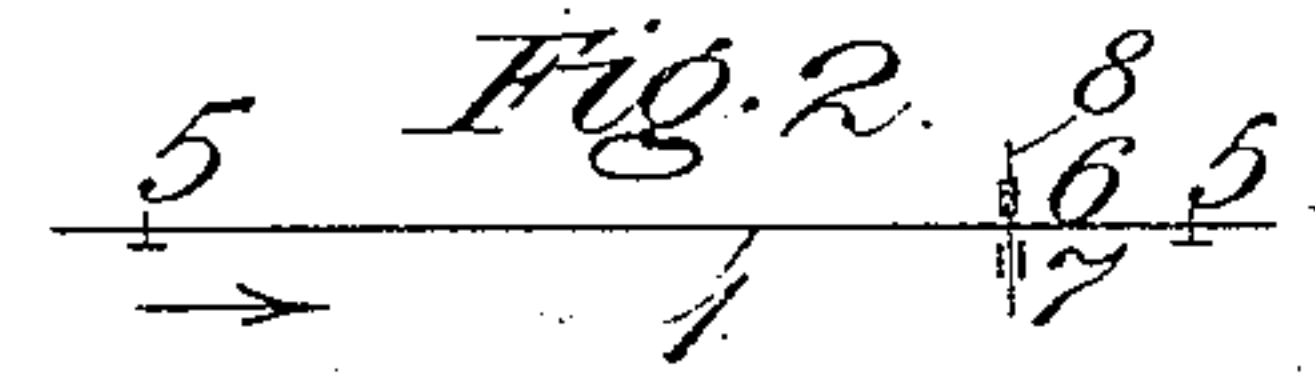
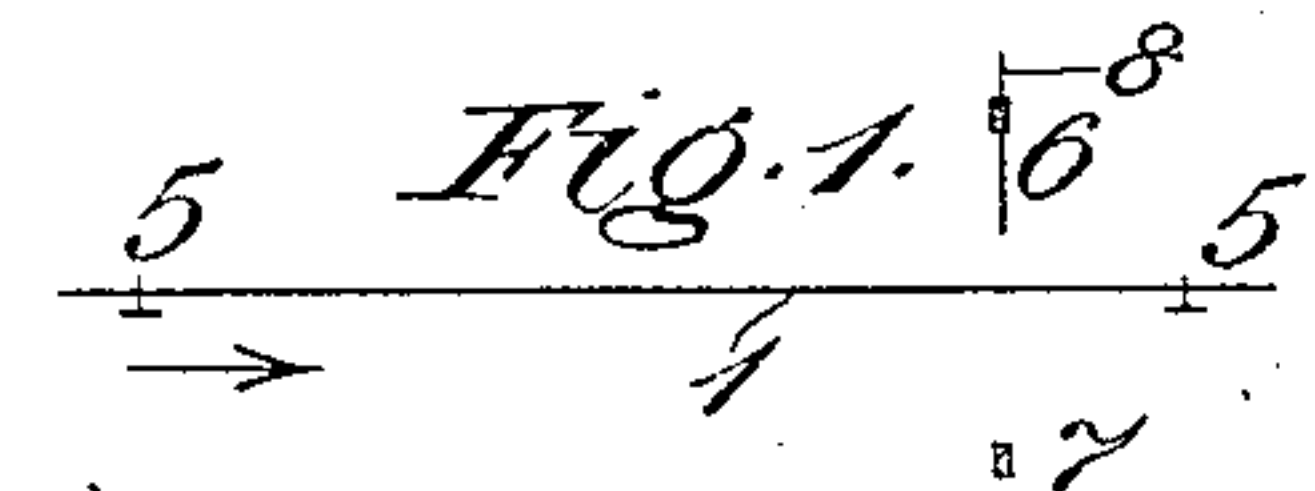
PATENTED DEC. 18, 1906.

G. OEHLER & T. BAUER.

APPARATUS FOR REPAIRING DEFECTS IN TEXTILE FABRICS.

APPLICATION FILED AUG. 2, 1904.

4 SHEETS—SHEET 1.



Witnesses.

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Fig. 14.

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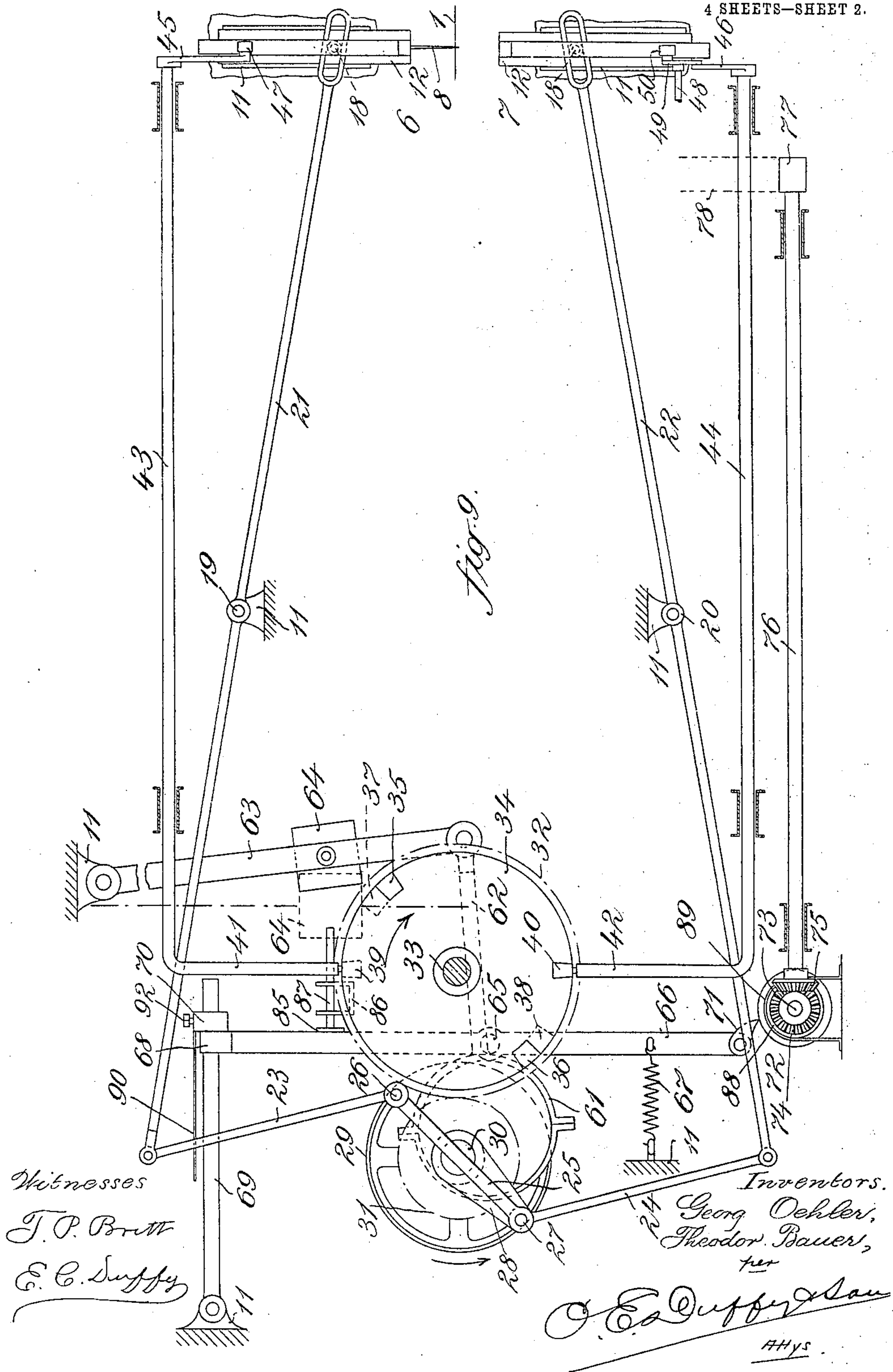
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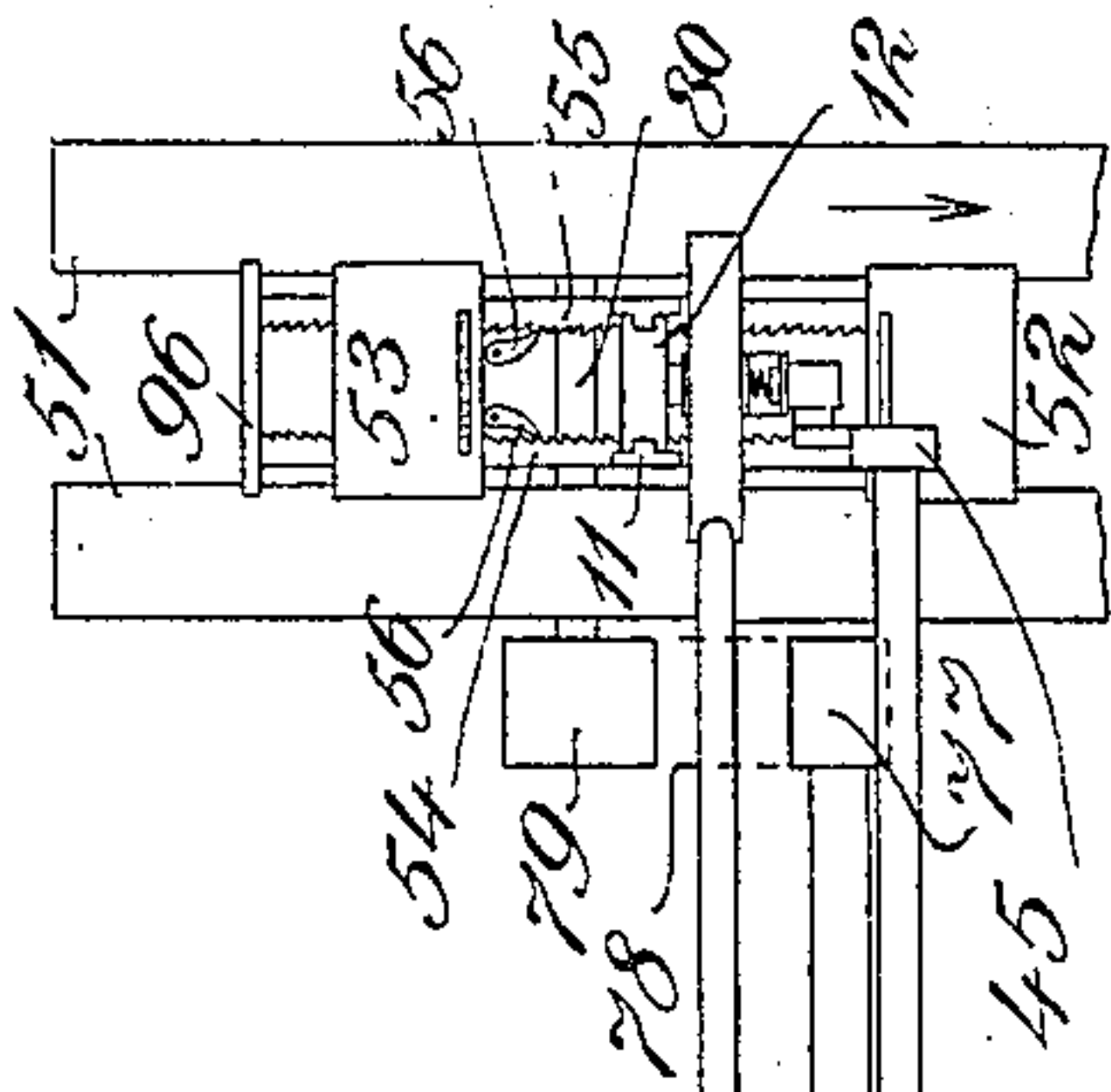
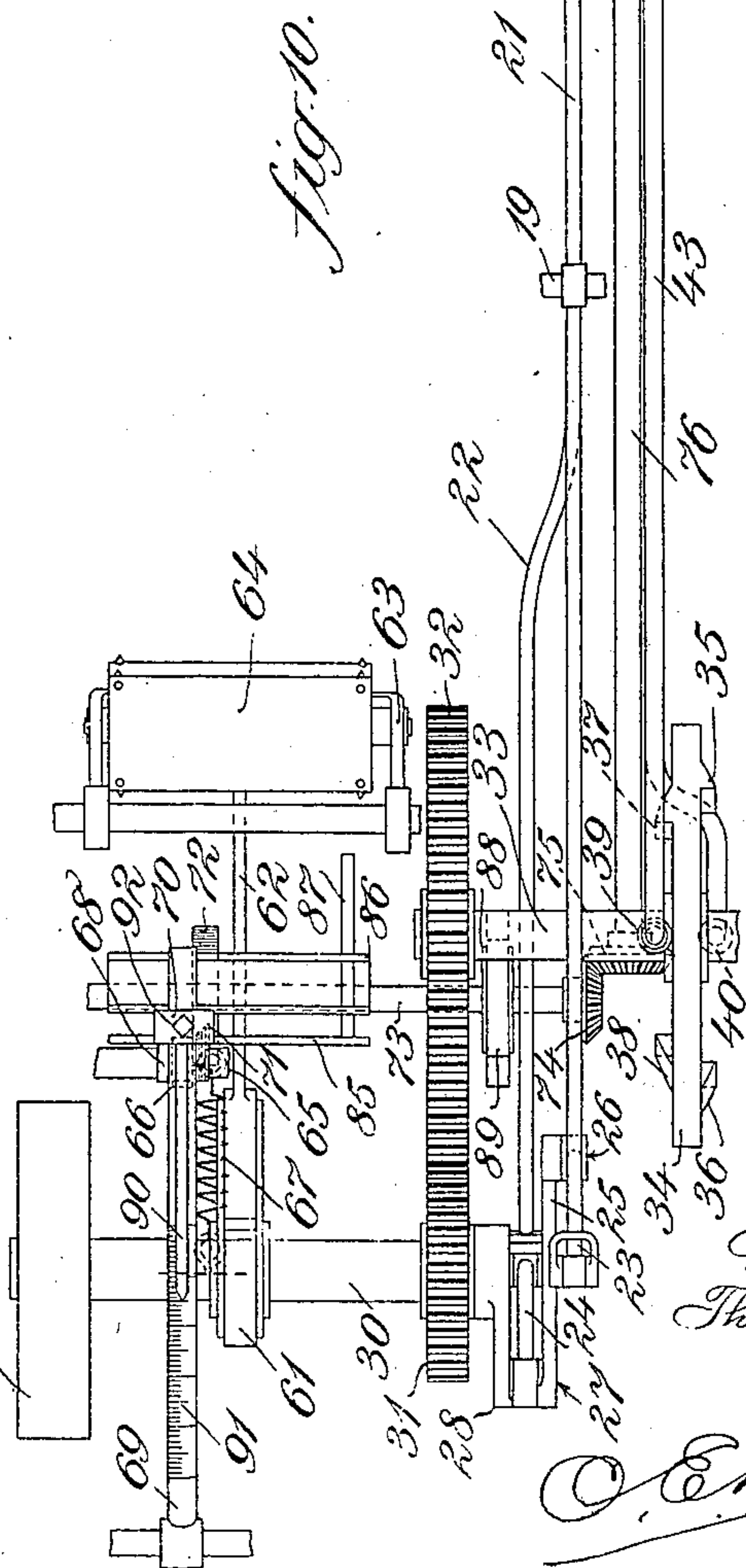


Fig. 10.



Witnesses

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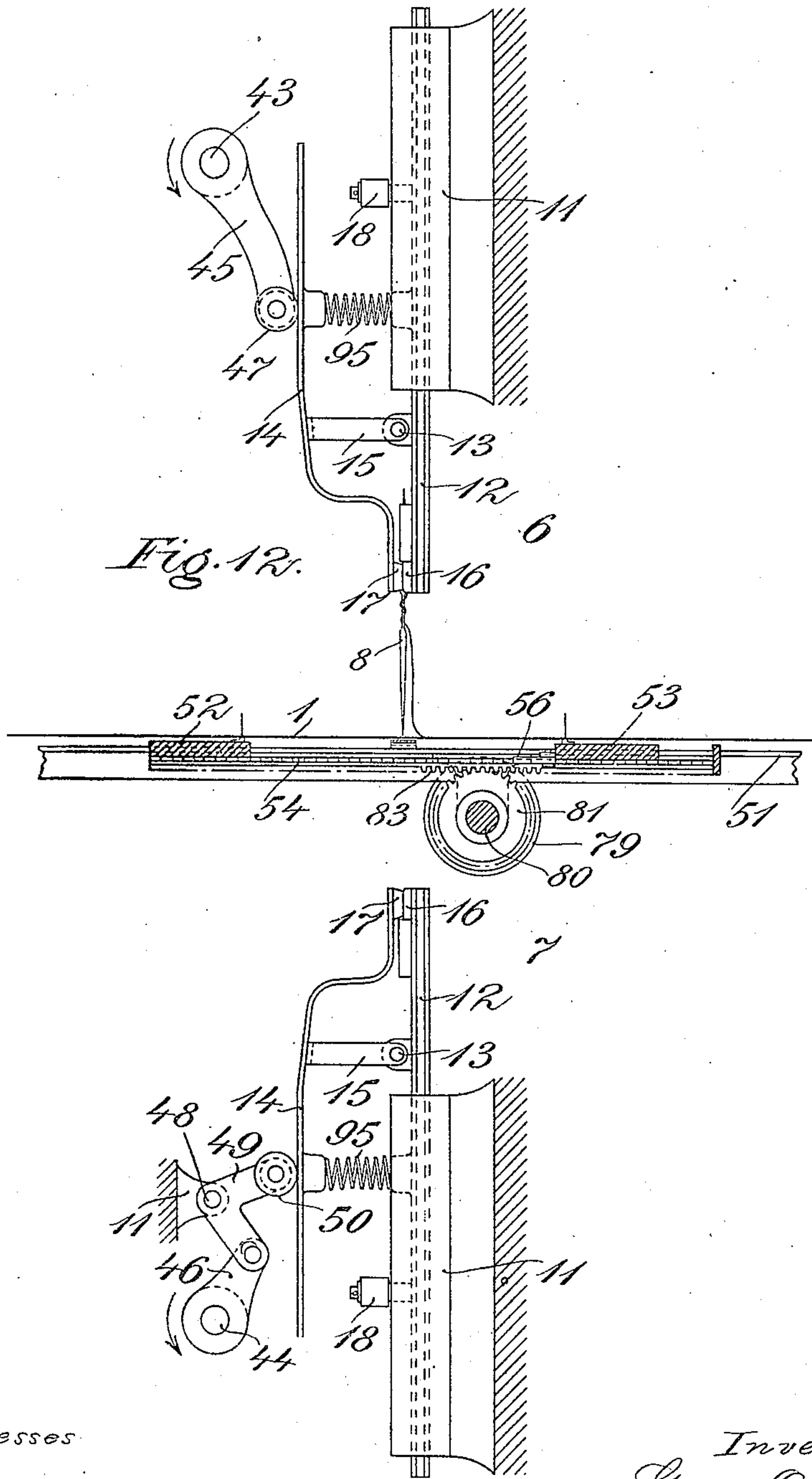
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4 SHEETS—SHEET 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

GEORG OEHLER AND THEODOR BAUER, OF GREIZ, GERMANY.

APPARATUS FOR REPAIRING DEFECTS IN TEXTILE FABRICS.

No. 838,890.

Specification of Letters Patent.

Patented Dec. 18, 1906.

Application filed August 2, 1904. Serial No. 219,247.

To all whom it may concern:

Be it known that we, GEORG OEHLER, manufacturer, a subject of the Prince of Reuss ä. L., and THEODOR BAUER, foreman, a subject of the Prince of Reuss j. L., residing at Greiz, Reuss ä. L., German Empire, have invented new and useful Improvements in Apparatus for Repairing Defects in Textile Fabrics, of which the following is a specification.

Our invention relates to apparatus for restoring the texture or pattern at places in textile fabrics rendered defective through breakage of the warp or weft.

The essential feature of our invention is that the thread which restores the proper interweaving at the defective part of the fabric by means of two devices which actuate the thread-carrying instrument is conducted from the face of the fabric through the same to the back and from here back again—that is to say, from the back of the fabric through the same to the face—in such manner that the missing portion of the broken thread is restored.

Our invention is illustrated in the accompanying drawings, in which—

Figures 1 to 7 are diagrams illustrating the process. Fig. 8 shows a piece of fabric rendered defective through breakage of the warp or weft. Fig. 9 shows a side view of the driving mechanism of the machine. Fig. 10 is a plan of Fig. 9. Fig. 11 shows two views of the instrument employed for carrying the thread. Fig. 12 is a detail view of the clamp mechanism with coöperating parts. Fig. 13 is a side elevation of Fig. 12. Fig. 14 shows a front view, and Fig. 15 a side view, of a portion of a device employed to stretch the fabric being repaired.

We will first proceed to describe the process of repairing, making reference to Figs. 1–8, and we shall assume that a piece of fabric 1, Fig. 8, is to be repaired, its thread 2 having broken in the course of weaving, so that a portion of such thread is missing, a line of defect 3 4 being thus caused. For the sake of illustration we shall further assume that the fabric in question is canvas. The fabric 1 is first spread on a stretching apparatus 5 5, Figs. 1–7. Above and below the fabric are clamping devices 6 7, which alternately approach and recede from each other in vertical

direction, being opened and closed at certain intervals by the mechanism of the machine. These devices 6 7 actuate the instrument which carries the thread. This instrument may conveniently be of the form shown in Fig. 12—that is to say, a needle 8, pointed at both ends and having eyes 9, through which the repairing-thread 10 passes. This needle is passed through the fabric by the devices 6 7 from the face of the fabric through the same to the back and then on the return from the back through the fabric to the face in such manner that the needle 8 at each descent and ascent passes between two of the threads which lie transversely of the threads 2 2 at the defective place, as indicated by the dots in Fig. 8. For this purpose the fabric can be fed forward at intervals, (in the case of canvas through the same distance each time,)—for instance, in the direction of the arrow, Figs. 1–7—before each stitch of the vertically-reciprocating needle, whereby the needle has then only to move continuously always in the same vertical plane.

In the following description the first case is assumed, and the method of operation is as follows: If the clamps 6 7 are in the position shown in Fig. 1 and the needle 8 is held between the jaws of the clamp 6, the repairing work may be commenced. Fig. 2 illustrates the simultaneous descent of the closed clamp 6 and ascent of the open clamp 7. Fig. 3 illustrates the closing of the clamp 7, opening of the clamp 6. Fig. 4 illustrates the simultaneous descent of the closed clamp 7 and ascent of the closing clamp 6, fabric fed forward. Fig. 5 illustrates the simultaneous ascent of the closed clamp 7 and descent of the opening clamp 6. Fig. 6 illustrates the closing of the clamp 6, opening of the clamp 7. Fig. 7 illustrates the simultaneous ascent of the closed clamp 6 and descent of the closing clamp 7, fabric fed forward. The position of the clamps now corresponds again to that in Fig. 1, and the process is repeated until the texture of the defective part 3 4 of the fabric is restored. After the repaired fabric is removed from the stretching apparatus the superfluous ends of the thread thus stitched in are cut off, and the place is now perfectly restored.

We will now proceed to describe the apparatus for reciprocating the clamps 6 7, mak-

ing reference to Figs. 9, 10, 12, 13. In the part 11, Figs. 12 and 13, of the frame are arranged the upper and lower clamps 6 7, respectively, for actuating the needle 8. Each clamp consists of a bar 12, guided by the frame, which bar carries a lever 14, the member 15 of which is pivoted to the bar by the pin 13. The lever 14 is controlled by a spring 95, which tends to close the jaws 16 17 at the extremity of the parts 12 14, so that the needle 8 can be firmly held between them. 18 18 are pins secured to the bars 12 12, and each is embraced by a lever 21, (or 22,) having its fulcrum at 19, (or 20,) each of said levers having arms 23, (or 24,) linking it to a common arm 25, the arm 23 being pivoted to 25 at 26 and the arm 24 at 27. At 27 is also connected the crank 28, mounted on the shaft 30, driven by the pulley 29. If, therefore, the pulley 29 rotates in the direction of the arrow shown in Fig. 9, the levers 21 22 will oscillate, reciprocating the clamps 6 7 in vertical direction.

We will next describe the apparatus for opening and closing the clamps 16 17, again making reference to Figs. 9, 10, 12, 13. On the driving-shaft 30 there is mounted a toothed wheel 31, meshing with the toothed wheel 32 of the shaft 33, on which is keyed the disk 34. The latter is provided on both sides with diametrically oppositely located projections 35 36 and 37 38, the projections on the one side being somewhat displaced relatively to those on the other. These projections coöperate with the rollers 39 40 of the arms 41 42 of the spindles 43 44, which turn in bearings in the machine-frame, the other ends of these spindles being provided with arms 45 46, respectively. The arm 45 carries a roller 47, which bears against the lever 14, which is actuated by the spring 95. Connected to the arm 46 is a bell-lever 49, pivoted at 48 to the machine-frame, the free end of which lever carries the roller 50, which bears against the arm 14 of the clamp 7. On rotation of the disk 34 in the direction of the arrow shown in Fig. 9 the projections 35 36 coöperate with the lever 42 44 and the projections 37 38 with the lever 41 43 in such manner that the jaws 16 17 of the clamps 6 7 are regularly opened and closed for the purpose of effecting the movements already described in reference to Figs. 1-7.

Next we will set forth the details of the device for stretching the fabric to be repaired, making reference to Figs. 10, 12, 13, 14, 15. The bearers or bars 51 51, Figs. 10, 12, 13, which form the work-table, support two slides 52 53, slide 32 being secured to two ratchet-bars 54 55, connected by the cross-piece 96 to the bars 51 51. The other slide 53 can be adjusted relatively to the slide 52 in the direction of length of the bars 51, and

detents 56, coöperating with the ratchet-bars 54 55, are provided for the purpose of insuring the proper position of the slide 53. Each slide carries a stretching device or comb 57, Figs. 14, 15, each consisting of a principal tooth 58 and several shorter teeth 59. Between the principal tooth and the two groups of auxiliary teeth a space 60 may advantageously be left, as this facilitates proper stretching of the fabric. For the purpose of stretching the fabric the latter is secured to the one comb 57. The principal tooth 58 is introduced into the fabric in the continuation of the line of defect 3 4, whereupon the fabric at each side of the tooth 58 is stretched over and pushed down upon the auxiliary teeth 59. Hereupon the tooth 58 of the other comb is brought into the continuation of the same line 3 4 and the fabric then stretched at either side of the said tooth and pressed over the auxiliary teeth. Finally for the purpose of keeping the fabric stretched in the longitudinal direction (line 3 4) the slide 53 is adjusted—that is to say, pushed so far from the slide 52 that the fabric is stretched. Since now, as Fig. 13 shows, the longitudinal axes of the principal teeth 58 exactly cover the longitudinal axes of the needle 8 and, furthermore, since the teeth 58 lie in alinement with the line of defect 3 4, it is obvious that the needle 8 in making a stitch must come in the line 3 4—that is to say, can conduct the repairing-thread in the correct position through the material.

We will finally describe the device for feeding the fabric.

Before each new stitch of the needle 8 the fabric must be fed forward corresponding to the nature of the interweaving. If the fabric is canvas, (as has been assumed,) it must be fed forward through the same distance each time.

Through the driving-shaft 30 an eccentric 61 is turned, the rod 62 of which is connected to the oscillating fork 63, jointed to the machine-frame. The fork 63 carries a revolving body 64, which on oscillation of the fork 63 to and fro coöperates with a lever 66, pivoted at 65 and controlled by a spring 67, which tends to maintain the lever 66 in the position shown in Fig. 9, the forked end 68 engaging with a rod 69, carried by the frame 11 and bearing against a stop 70 on this rod. The other end of the lever 69 carries a detent device 71, which presses against the wheel 72, which has fine ratchet-teeth and is mounted on the shaft 73. On the latter there is also mounted a bevel-wheel 74, gearing with the bevel-wheel 75 of the shaft 76. The shaft 76 has mounted on it the pulley 77, the belt 78 of which runs round the pulley 79 on the shaft 80. The toothed wheels 81 82 of this shaft 80 engage in the teeth 83 84 of the rack pro-

vided on the under side of the ratchet-bars 54 55, Fig. 13. The revolving body 64 coöperates with the lever 66 in the present example with aid of a bar 85, carried by the lever 66, and of the pin 87, located before this bar 85 in the L-shaped part 86. If, therefore, the prism oscillates out of the full-line position, Fig. 9, into the dotted-line position, the pin 87, and thus also the upper arm of the lever 66, will be pressed back, whereby the detent device 71 will advance and the ratchet-wheel 72 will be turned through a certain distance. Hereby the shaft 76, the belt-pulleys 77 79, and the shaft 80 will be turned through a corresponding amount, and thereby the toothed racks 83 84 will be advanced farther in the direction of the arrow, Fig. 10, the result being that the fabric held by the stretching-combs of the slides 52 53 will be fed forward also. This feed of the fabric takes place before each stitch of the needle 8.

In order after each forward movement of the wheel 72 to make sure that the shaft 73, carrying the said ratchet-wheel, keeps its position, so that the proper further feed of the fabric is insured, the shaft 73 is provided with a disk 88, which is under the action of a brake-band 89, secured to the frame, so that unintentional displacement of the parts of the whole ratchet mechanism is prevented.

In order that the feed device may be employed for fabrics of different thicknesses, a stop 70 of the lever 69 is rendered adjustable, for instance, by means of a set-screw 92. A pointer 90 on the stop 70 and a scale 91 on the lever 69 may be employed for exact adjustment. If, for instance, the stop in Fig. 9 is set more to the left, the stroke of the detent is smaller than if the stop is set more to the right.

The details of the described apparatus can be greatly varied without departure from the essential features of the invention.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A machine for restoring the texture or pattern of textile fabrics, comprising a main shaft, a crank mounted thereon, a lever system pivoted to the crank, clamps located above and below the fabric and reciprocated vertically by the said lever system, a repairing-thread carrier passed up and down through the fabric by said clamps, a shaft geared to the main shaft, a disk, having cam-surfaces, mounted on the auxiliary shaft, shafts mounted in the framing, rocked by the said cams and opening and closing the said clamps, an eccentric mounted on the main shaft, a fork suspended from the framing and oscillated by the eccentric, a revolving body carried by the fork, a spring-controlled lever pivoted to the

framing, means projecting from the lever in the path of the revolving body, a rod secured to the framing, engaging one end of said lever, a stop on the said rod, a detent at the other end of said lever, a ratchet-wheel engaged by the detent, a shaft carrying said wheel, a second shaft geared to the ratchet-wheel shaft, and a sliding device carrying the fabric and actuated by the said second shaft, substantially as described.

2. A machine for restoring the texture or pattern of textile fabrics, comprising a main shaft, a crank mounted thereon, a lever system pivoted to the crank, clamps located above and below the fabric and reciprocated vertically by the said lever system, a repairing-thread carrier passed up and down through the fabric by said clamps, a shaft geared to the main shaft, a disk, having cam-surfaces, mounted on the auxiliary shaft, shafts mounted in the framing, rocked by the said cams, and opening and closing the said clamps, an eccentric mounted on the main shaft, a fork suspended from the framing and oscillated by the eccentric, a revolving body carried by the fork, a spring-controlled lever pivoted to the framing, means projecting from the lever in the path of the revolving body, a rod secured to the framing, engaging one end of said lever, a stop on the said rod, a detent at the other end of said lever, a ratchet-wheel engaged by the detent, a shaft carrying said wheel, a second shaft geared to the ratchet-wheel shaft, a work-table, fabric-holding slides supported thereon, one of which carries ratchet-bars and the other pawls engaging therewith, racks secured to the said bars, a shaft located below the racks and driven by the last-mentioned second shaft, pinions mounted on this driven shaft, meshing with said racks, and a fabric-stretching device consisting, on each slide, of a principal tooth and auxiliary teeth set at a distance therefrom on each side, substantially as described.

3. A machine for restoring the texture or pattern of textile fabrics, comprising a main shaft, a crank mounted thereon, a lever system pivoted to the crank, clamps located above and below the fabric and reciprocated vertically by the said lever system, a repairing-thread carrier passed up and down through the fabric by said clamps, a shaft geared to the main shaft, a disk, having cam-surfaces, mounted on the auxiliary shaft, shafts mounted in the framing, rocked by the said cams and opening and closing the said clamps, an eccentric mounted on the main shaft, a fork suspended from the framing and oscillated by the eccentric, a revolving body carried by the fork, a spring-controlled lever pivoted to the framing, means projecting from the lever in the path of the revolving body, a rod provided with a scale secured to the framing, engaging

one end of the said lever, a stop on the said
rod, a pointer secured to the said stop and
moving over said scale, a detent at the other
end of the said lever, a ratchet-wheel engaged
5 by the detent, a shaft carrying said wheel, a
second shaft geared to the ratchet-wheel shaft
and a sliding device carrying the fabric and
actuated by the said second shaft, substan-
tially as described.

In witness whereof we have hereunto signed to
our names, this 20th day of June, 1904, in
the presence of two subscribing witnesses.

GEORG OEHLER.
THEODOR BAUER.

Witnesses:

PAUL GOLK,
ALBRECHT TOLLES.