

No. 677,065.

Patented June 25, 1901.

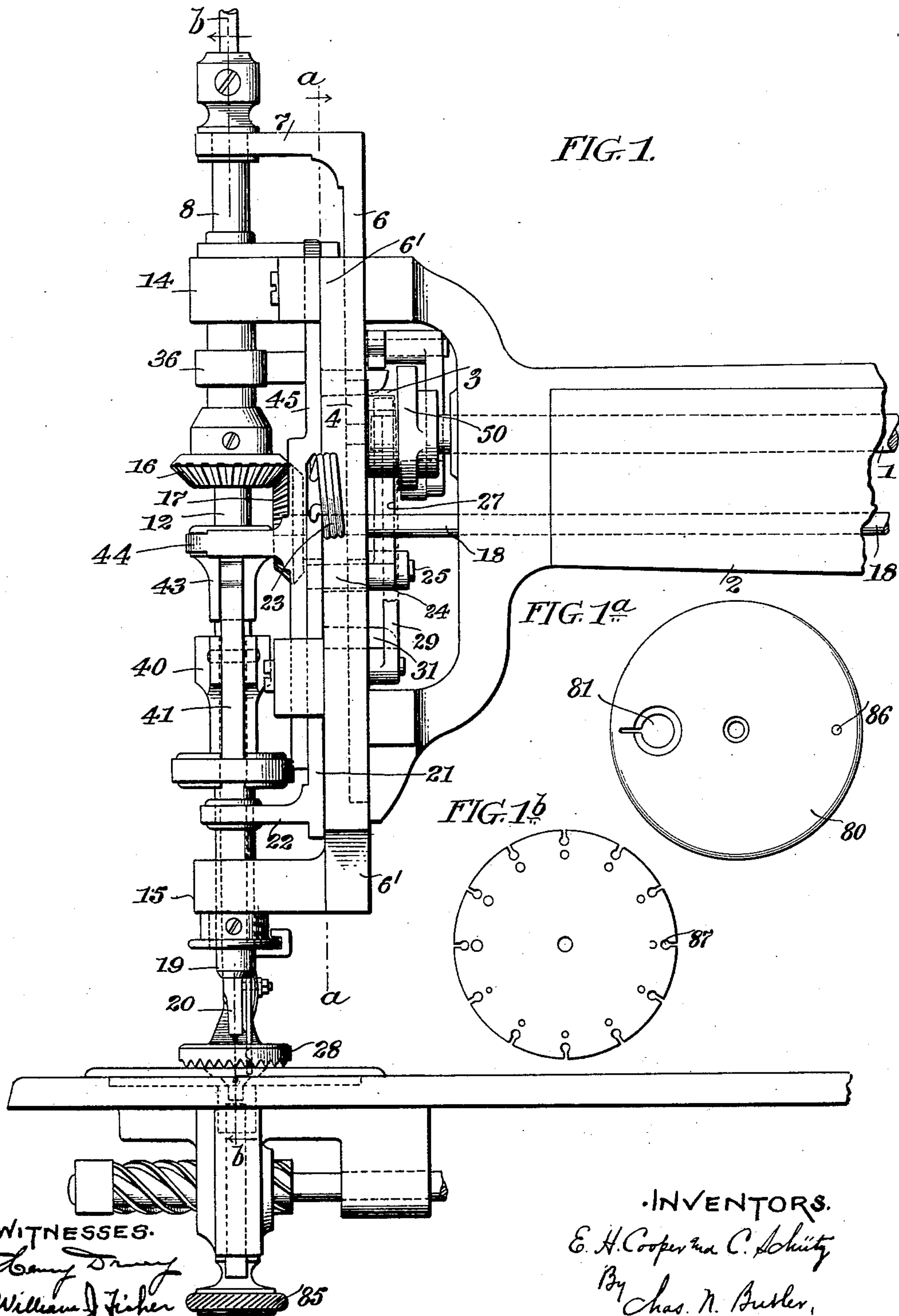
E. H. COOPER & C. SCHÜTZ.

CUTTING ATTACHMENT FOR SEWING MACHINES.

(Application filed Sept. 11, 1900.)

(No Model.)

4 Sheets—Sheet 1.



WITNESSES.

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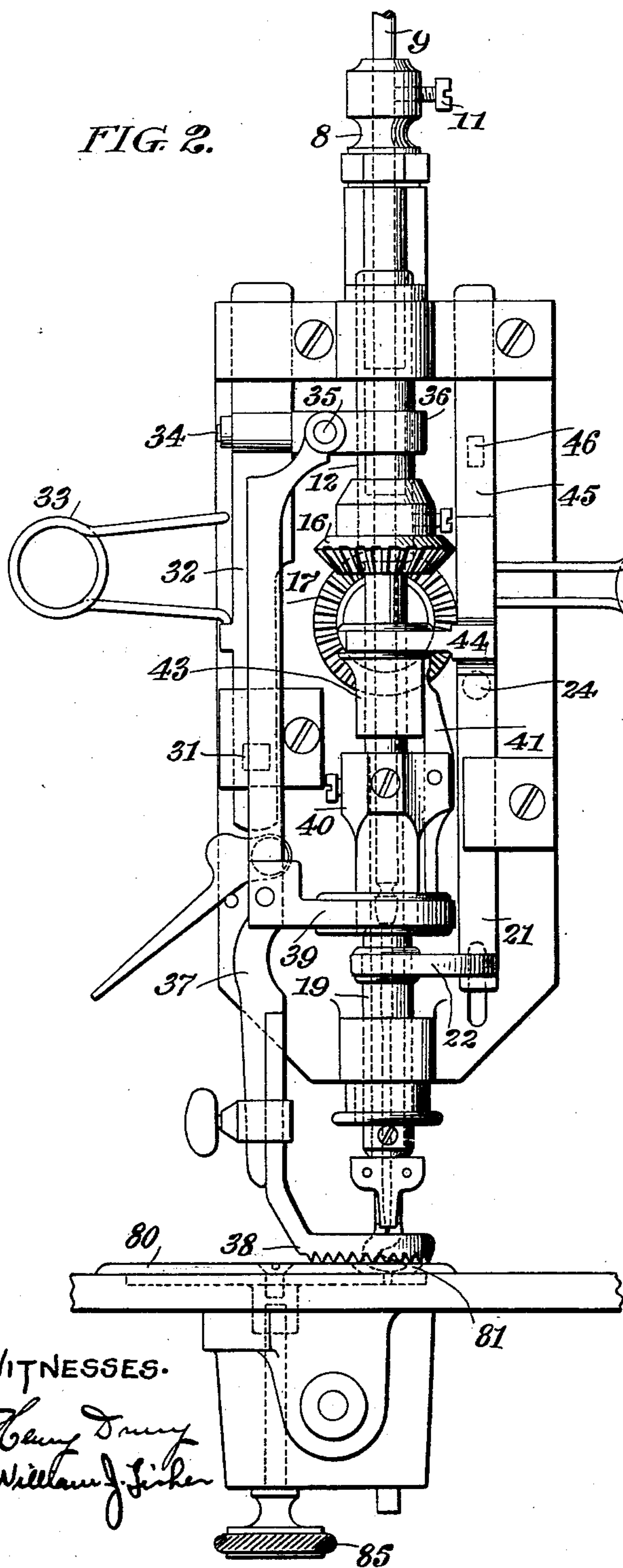
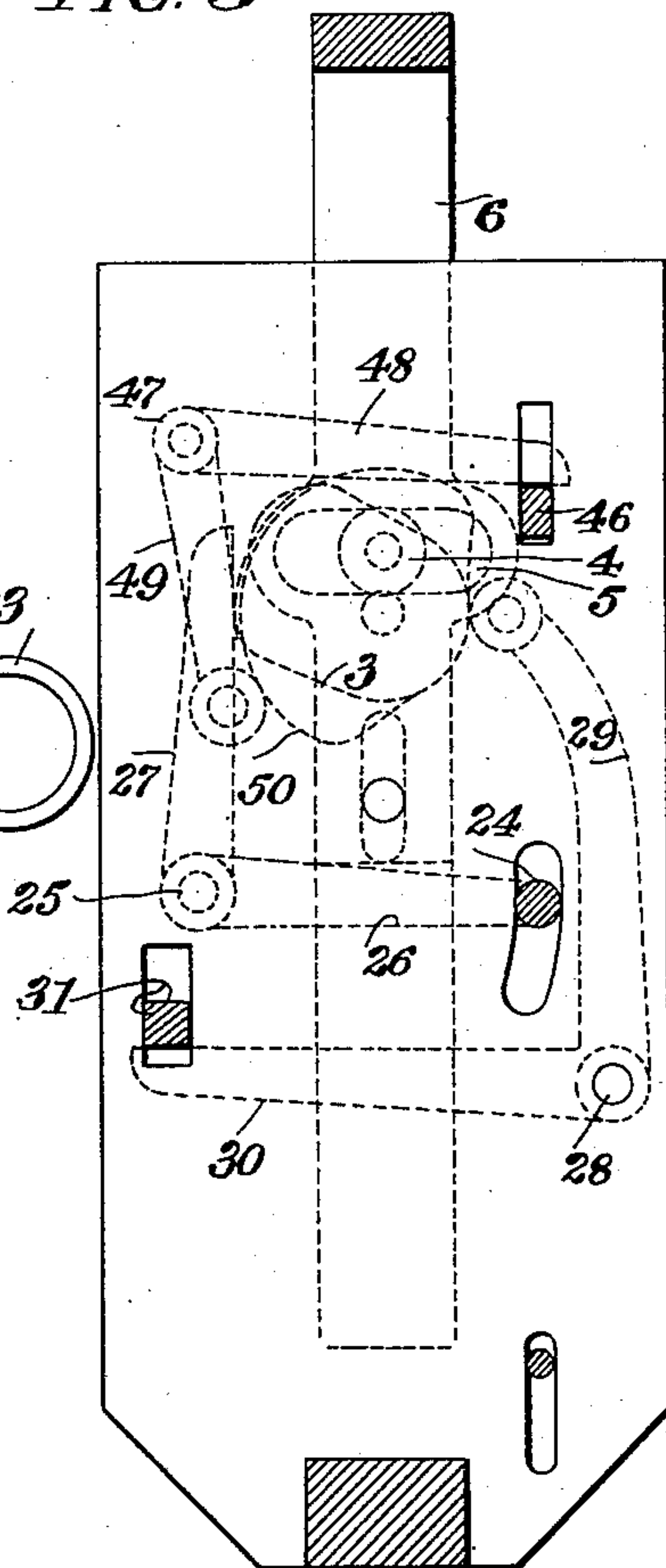


FIG. 3



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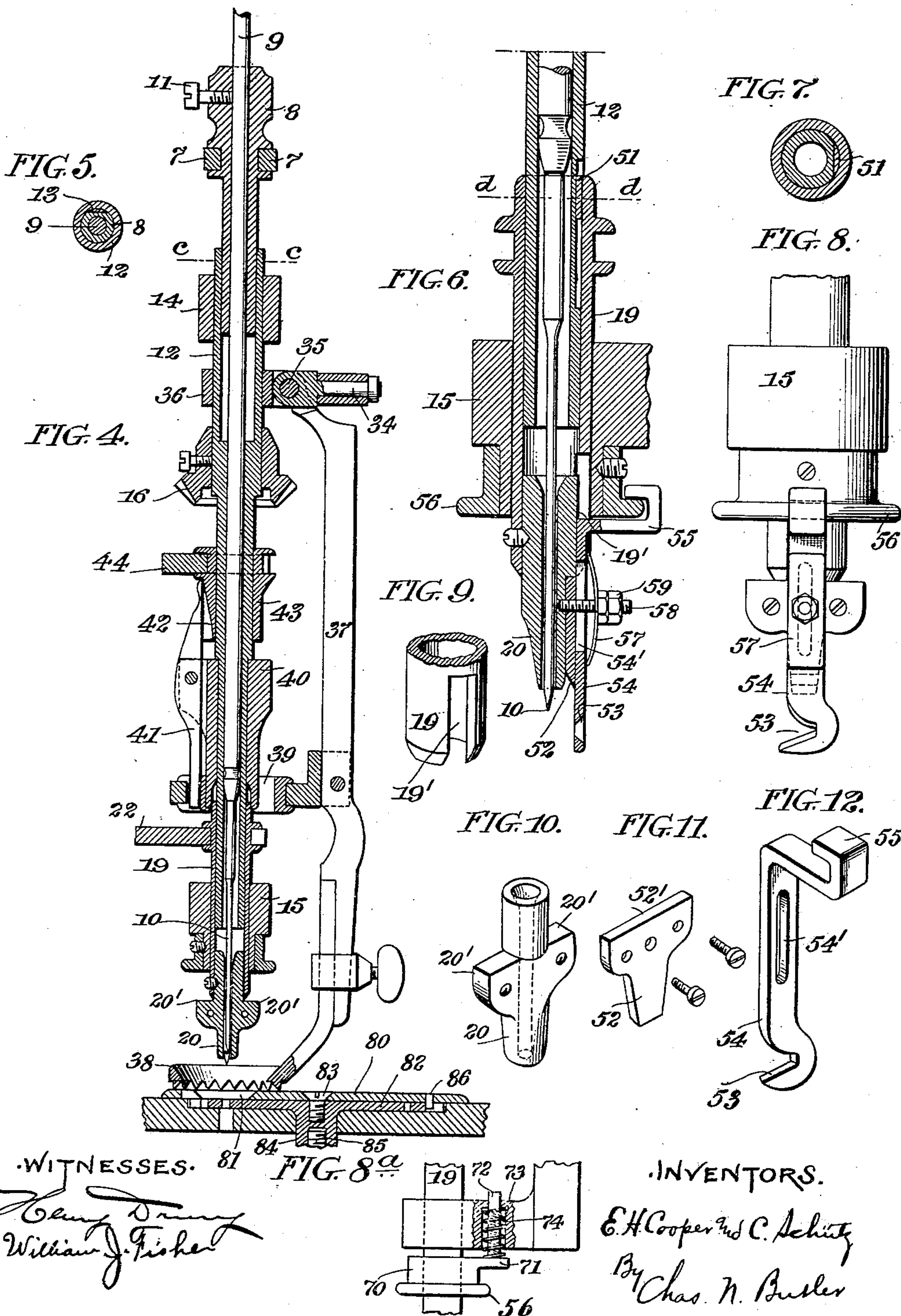
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FIG. 15.

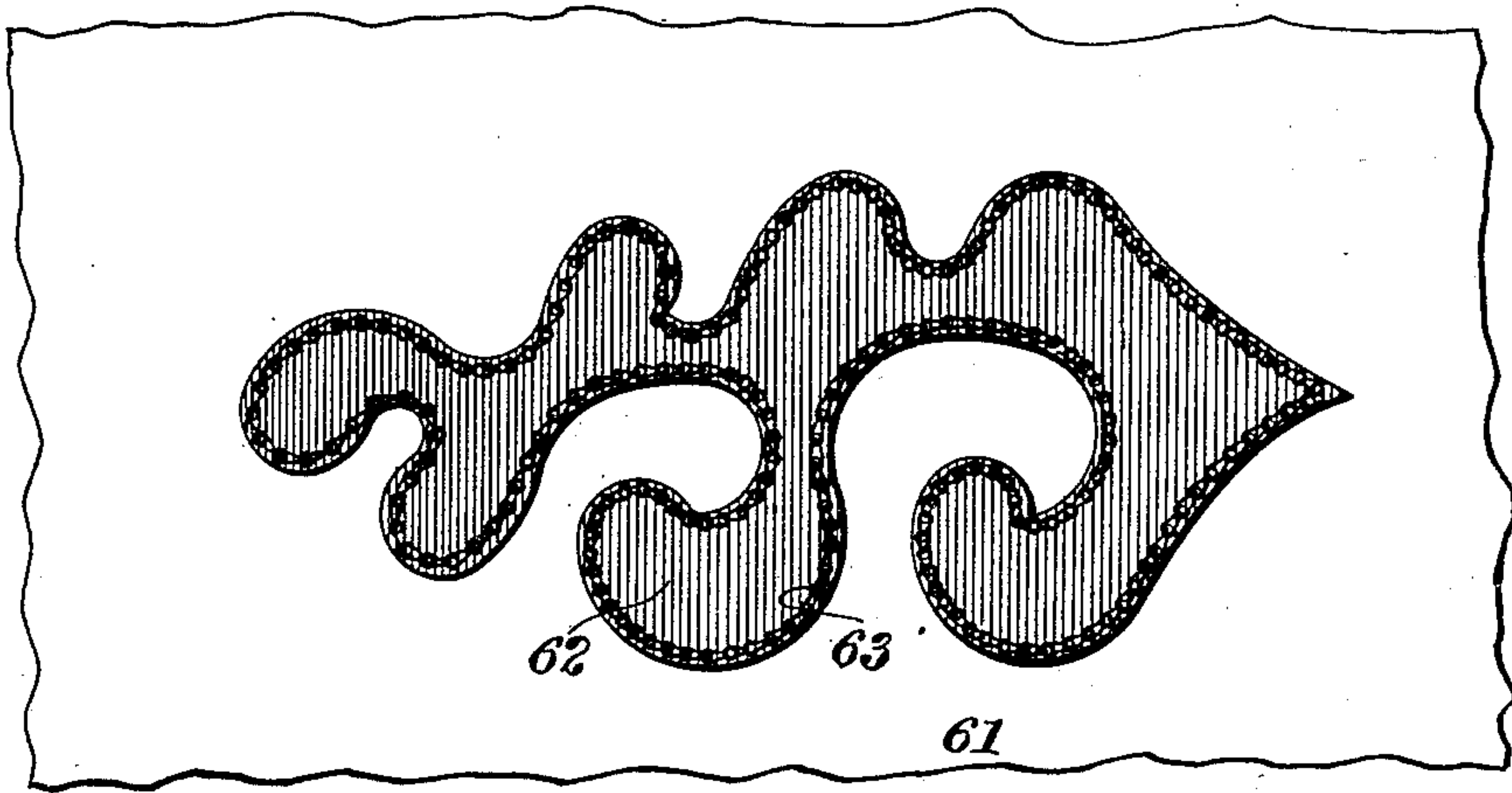


FIG. 14.

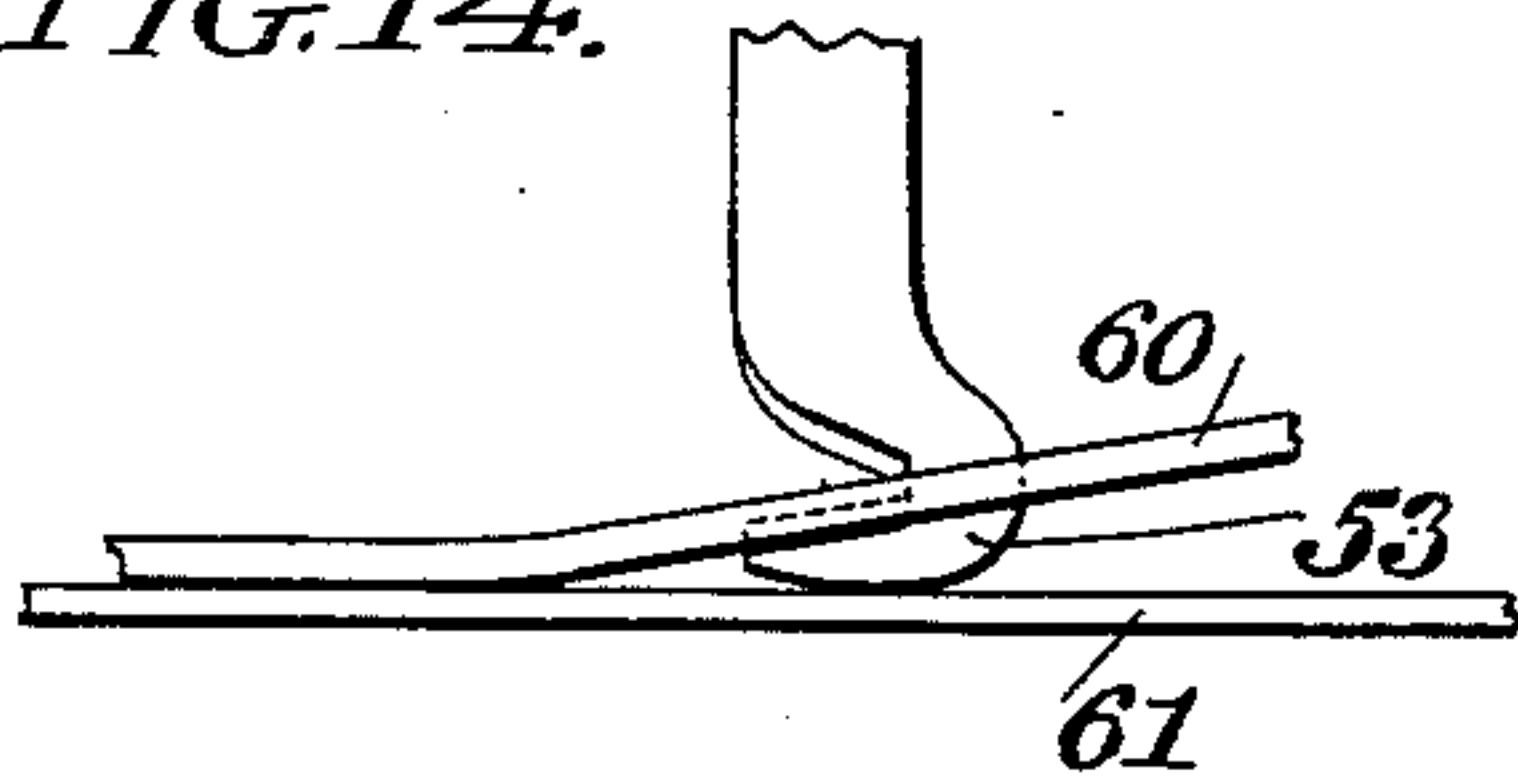


FIG. 13.

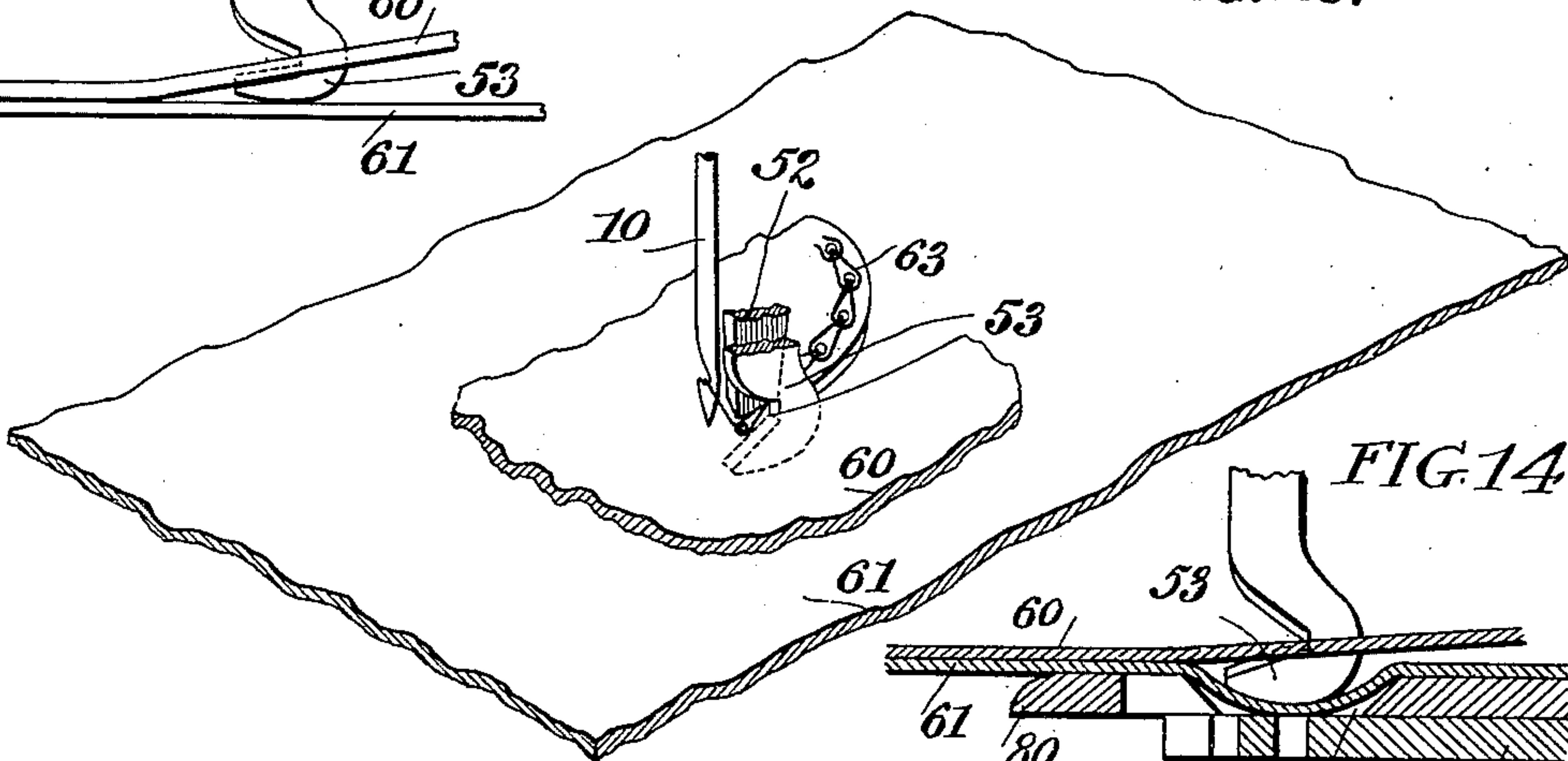
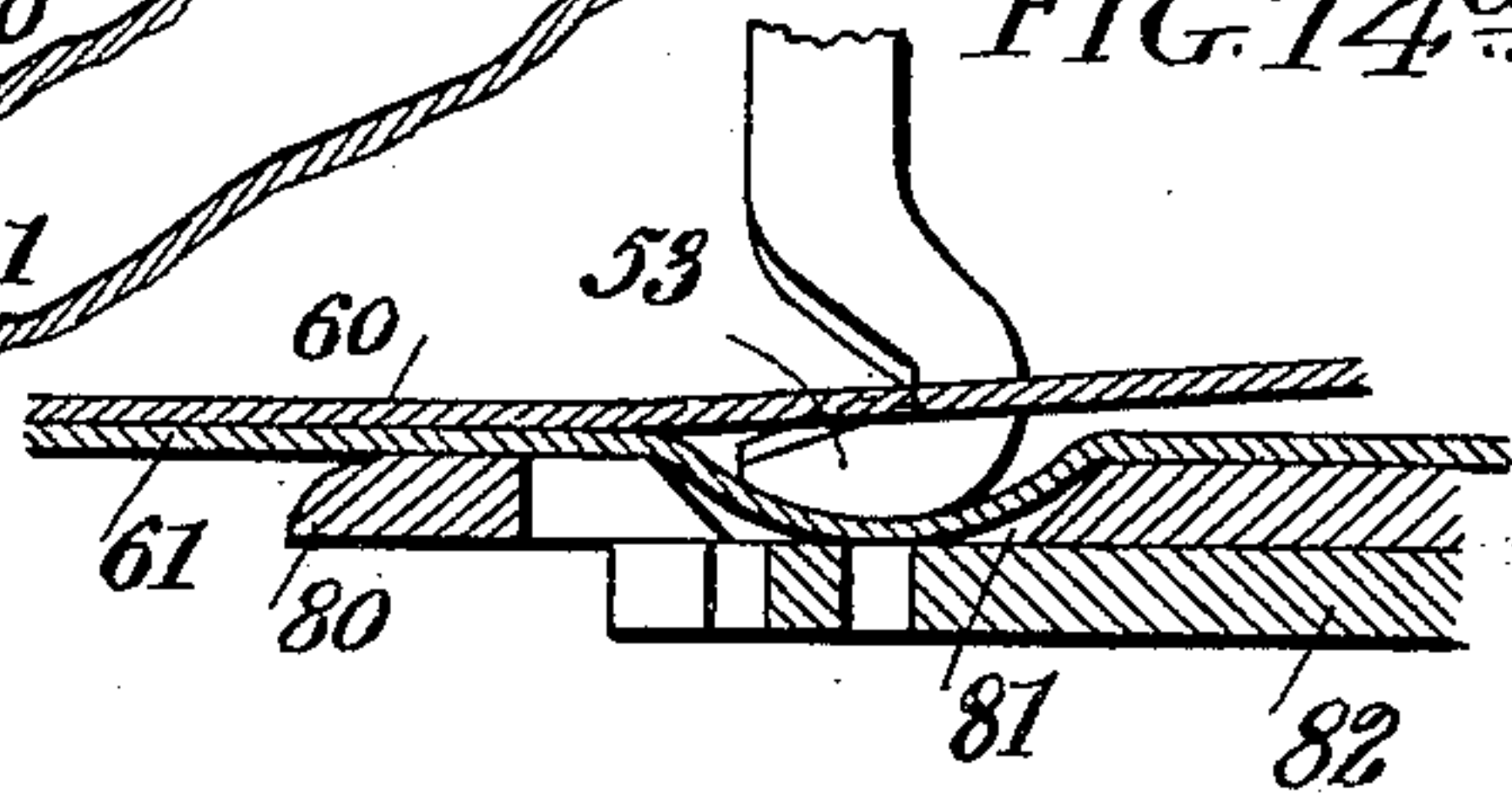


FIG. 14^a.



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UNITED STATES PATENT OFFICE.

ERNEST H. COOPER AND CONRAD SCHÜTZ, OF PHILADELPHIA,
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CUTTING ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 677,065, dated June 25, 1901.

Application filed September 11, 1900. Serial No. 29,649. (No model.)

To all whom it may concern:

Be it known that we, ERNEST H. COOPER and CONRAD SCHÜTZ, residents of the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Cutting Attachments for Sewing-Machines, of which the following is a specification.

This invention is a mechanically-operated cutting device capable of being turned about its axis in any direction required for following a pattern or outline. It is particularly designed for cutting out figures from fabrics parallel to figured stitching through operations by which the cutting and stitching are effected simultaneously by coöperating mechanisms. It is specially adapted for making appliqué-work or for attachment to sewing-machines for use in producing appliqué fabrics, such as the Bonnaz machine, in connection with the operations of which it has heretofore been necessary to cut the figures out by hand or separate mechanism after the stitching has been completed.

The present improvements not only save the former tedious operations incidental to cutting out the figures after the stitching has been completed, but also produce a more uniform and perfect result than has previously been attained.

In the accompanying drawings, illustrating the invention, Figure 1 is a side view of the head of a sewing-machine for producing appliqué-work embodying our improvements. Fig. 1^a is a plan view of the foot-plate forming part of our invention. Fig. 1^b is a plan view of the needle-plate, with which the foot-plate coöperates. Fig. 2 is a front view of the mechanism shown in Fig. 1. Fig. 3 is a sectional view taken on the line *a a* of Fig. 1. Fig. 4 is a sectional view taken on the line *b b* of Fig. 1. Fig. 5 is a sectional view taken on the line *c c* of Fig. 4. Fig. 6 is an enlarged vertical sectional view taken through the cutting device on the line of the needle. Fig. 7 is a sectional view taken on the line *d d* of Fig. 6. Fig. 8 is a side view of the cutting device and its connections. Fig. 8^a shows a preferred form of connection for controlling the lower knife. Fig. 9 is a perspective view of the bottom of the sleeve which carries the

nipple. Fig. 10 is a detached perspective view of the nipple. Fig. 11 is a detached perspective view of the upper knife. Fig. 12 is a detached perspective view of the lower knife. Fig. 13 is a perspective view showing the operating relations of the needle and shearing-knives to the appliqué-work. Fig. 14 is a side view of the lower cutting-knife in its relation to the appliqué-work. Fig. 14^a is a side view of the lower cutting-knife in its relation to the appliqué-work when the foot-plate is employed, and Fig. 15 is a view of a form of the finished product.

In the machine to which our invention is applied, as herein described, and shown in the drawings, the main shaft 1, journaled in the arm 2, has a cam 3 fixed on the end thereof, which carries a roller 4, eccentric to the axis of the shaft. The roller 4, revolved by the cam, works in a yoke 5 of a carrying-bar 6, which is thereby reciprocated in the guide-head 6', the carrying-bar having an arm 7, which engages and reciprocates the needle-carrying sleeve 8. This sleeve 8 is free to turn with respect to the arm 7 in order that the former may be revolved to revolve the needle-bar 9 and the needle 10, it being fixed to the needle-bar by a set-screw 11 and revolved by the needle-bar sleeve 12, within which it reciprocates, a key or plain bearing-surface 13 between the two sleeves effecting the revolution of the one from the other. The sleeve 12 is journaled in the arms 14 and 15 of the guide-head and is revolved by a bevel-gear 16, fixed thereon and driven by a bevel-gear 17, fixed on the revoluble shaft 18. The nipple-sleeve 19, having the nipple 20 fixed thereto and adapted to press upon and hold the fabric, is reciprocated vertically by the nipple-bar 21, having its arm 22 in engagement therewith, the nipple-bar being thrown down by a spring 23 and elevated by a pin 24, operated by a bell-crank pivoted at 25, the arm 26 of the bell-crank carrying the pin and the arm 27 bearing upon the periphery of the cam 3, which rocks it. The cam 3 also rocks a bell-crank pivoted at 28, having an arm 29 bearing against the periphery of the cam and an arm 30 against the pin 31, fixed to the vertically-movable bar 32, pressed down by the spring 33. The bar 32 is con-

nected by the pintles 34 and 35 with the collar 36, vertically movable upon the sleeve 12, which turns therein, and with the foot-bar 37, carrying the foot 38, which feeds the fabric, this support of the foot-bar permitting it universal motion. A collar 39, carried by the foot-bar, surrounds a sleeve 40, fixed to the revoluble sleeve 12, the collar engaging one arm of a lever 41, pivoted to the sleeve 40, and having its other end engaging the inclined slot 42 of a sleeve 43, vertically movable on the shaft 12, but revoluble therewith. The sleeve 43 is reciprocated by an arm 44 of a vertically-movable bar 45, which is lifted by the spring 23 and depressed by the pin 46, operated by a bell-crank pivoted at 47, having its arm 48 in engagement with the pin and its arm 49 in engagement with the periphery of a cam 50, revolved by the main shaft 1. The foregoing mechanism, well known prior to our invention herein explained, is described to render clear the principle and mode of operation of our improvements.

In the present application of our invention the nipple-sleeve 19 is connected by a key or plain bearing-surface 51 with the needle-bar sleeve 12, so that while the nipple-sleeve is free to reciprocate vertically upon the needle-bar sleeve it is held in fixed revoluble relation thereto. Hence the needle-bar sleeve turns the nipple-sleeve and the nipple 20, fixed thereto, together with the needle 10, reciprocating through the nipple. The nipple 20 carries and reciprocates a preferably straight knife 52, suitably secured thereto by forming shoulders 20' on the nipple to receive screws passed through the knife-head 52', the knife being set so that it cuts the fabric to be operated upon as it is carried down by the reciprocating nipple. Coöperating with the upper knife 52 is a lower knife 53, revolving therewith and held in shearing relation thereto. Preferably the lower knife-shank 54 is straight and provided with a yoke 55, which engages and turns freely upon the ring 56, thus permitting the lower knife free motion of revolution. This ring may be fixed to the arm 15 and the lower knife thus held vertically immovable; but preferably means are provided for pressing the lower knife down while permitting it limited vertical play in order that it may accommodate its position to various thicknesses of foundation fabric employed in appliqué-work. This limited vertical movement may be provided by making the ring 56 part of a loose sleeve 70, having a lug 71 and a pin 72 thereon, the latter playing in an opening 73 in the arm 15 and having a spring 74 thereon, which engages the arm and presses the sleeve down the knife carried thereby, as illustrated in Fig. 8^a. To hold the lower knife to the upper knife in fixed revoluble relation and to permit the latter to reciprocate while securing effective shearing action between them, the nipple-sleeve is provided with a slot 19' for receiving the knife-shank 54, having a slot 54' there-

through, through which and the spring 57 a set-bolt 58 is passed through the knife-head 52' and into the nipple 20, the nuts 59 being screwed down as may be required to secure efficient shearing relation.

In order that the lower knife 53, running between the fabrics 60 and 61, may not raise the upper fabric too much with reference to the lower one or turn the part to be cut at too sharp an angle for wholly-satisfactory results, there may be provided a foot-plate 80, having an opening 81 therethrough for receiving and permitting the operation therein of the knife 53 and the reciprocation therethrough of the needle 10. With this construction the lower fabric 61 is depressed by the knife 53, thus avoiding turning up the upper fabric too much for satisfactory work. This foot-plate 80 may be secured to the needle-plate 82 by a set-screw 83, engaging the needle-plate hub 84, which is in turn engaged and held by the set-screw 85. A pin 86 on the foot-plate engages any one of a series of apertures 87 of the needle-plate for the purpose of locking these parts together, so that the aperture 81 may always be under the foot 38, regardless of the position to which the needle-plate may be turned to accommodate needles of various sizes.

It will now be seen that in producing appliqué-work, as illustrated, the upper fabric 60 is sewed to the lower fabric 61 and the upper fabric cut in figures, as 62, the edges of which are parallel to the figured stitching 63, by simultaneous operations. As the lower knife is adapted to run between the two fabrics and the cutting device to turn about the needle and as the foot is adapted to feed the work to the needle and cutting device from any direction toward which they may be turned, any design may be sewed and cut out simultaneously. It will also be evident that the cutting device may be employed for cutting apart or independent of the sewing operation when this is desired, and, further, that it may be employed in any operation requiring a fabric to be cut or trimmed along a line of stitching, whether appliqué-work or not.

Having described our invention, we claim—

1. The combination, in a cutting device, of a knife adapted to run beneath a fabric, said knife having a shank acting in the plane of its blade and a yoke on said shank, a ring engaging said yoke and permitting said knife free motion of revolution, a vertically-reciprocating knife having a shank acting in the plane of its blade, mechanism for pressing said knives together in shearing relation, and mechanism for rotating said knives, substantially as specified.

2. The combination, in a sewing-machine, of a revoluble vertically-reciprocating needle, with a revoluble vertically-reciprocating nipple adapted to press upon and hold the fabric, a revoluble vertically-reciprocating straight knife fixed to said nipple, a second revoluble

knife and means for adapting it to run beneath a fabric and having a straight slotted shank, a tension-screw in said slot having means for holding said knives in shearing relation, and mechanism for effecting the coaction of said parts about a common center, substantially as specified.

3. The combination, in a sewing-machine, of a revoluble reciprocating needle, with a revoluble reciprocating nipple adapted to press upon and hold the fabric, a revoluble reciprocating knife fixed to said nipple, a second revoluble knife adapted to run beneath a fabric and having a slotted shank, a tension-screw in said slot having a spring connected therewith for holding said knives in shearing relation, and mechanism for effecting the coaction of said parts about a common center, substantially as specified.

4. The combination, in a cutting device, of a knife adapted to run beneath a fabric, said knife having a shank with a yoke thereon, a ring engaging said yoke and permitting said knife free motion of revolution, a vertically-reciprocating knife, mechanism for pressing said knives together in shearing relation, and mechanism for rotating said knives, substantially as specified.

5. The combination, in a cutting device, of a knife having a yoke connected therewith, a

ring engaging said yoke, and permitting said knife free motion of revolution, a spring for controlling the vertical movement of said ring and knife, and a vertically-reciprocating knife revolubly fixed to said first knife and held in shearing relation therewith, substantially as specified.

6. The combination, in a cutting device, of a knife revoluble about a vertical axis, with a foot-plate recessed to permit the operation of said knife therein, substantially as specified.

7. The combination, in a sewing-machine, of a foot-plate having an aperture therethrough recessed to permit the operation therein of a knife adapted to run beneath the fabric, with a needle-plate adjustable with relation to said foot-plate, and mechanism for holding said foot-plate to said needle-plate in the various positions to which said needle-plate may be adjusted, substantially as specified.

In testimony whereof we have hereunto set our hands, in the presence of the subscribing witnesses, this 7th day of September, 1900.

ERNEST H. COOPER.
CONRAD SCHÜTZ.

Witnesses:

THOMAS S. GATES,
PERCIVAL H. GRANGER.