(No Model.) 3 Sheets—Sheet 1.

P. SCHOEN.

BUTTON SEWING ATTACHMENT FOR SEWING MACHINES.

No. 464,042. Patented Dec. 1, 1891.

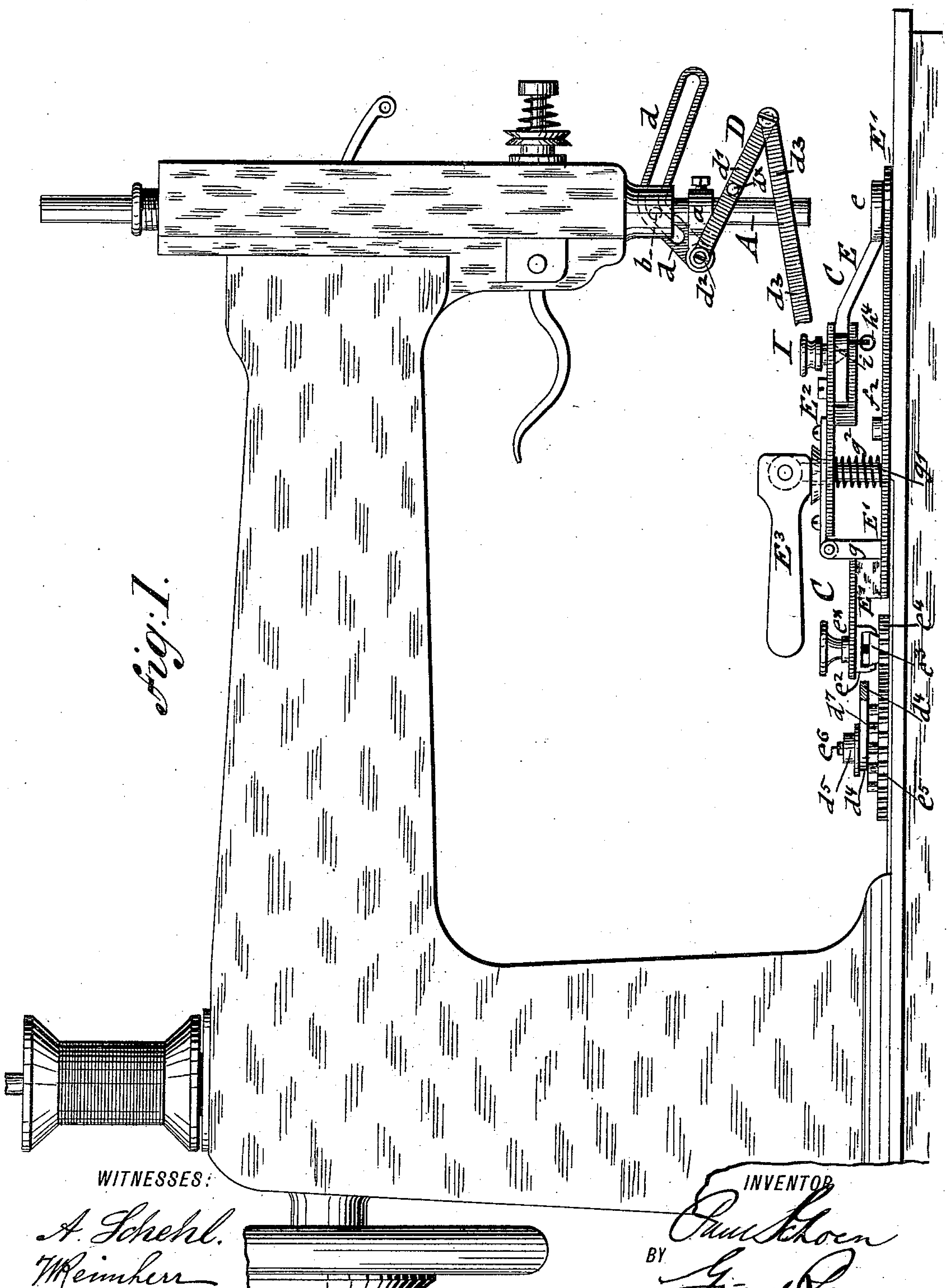

Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

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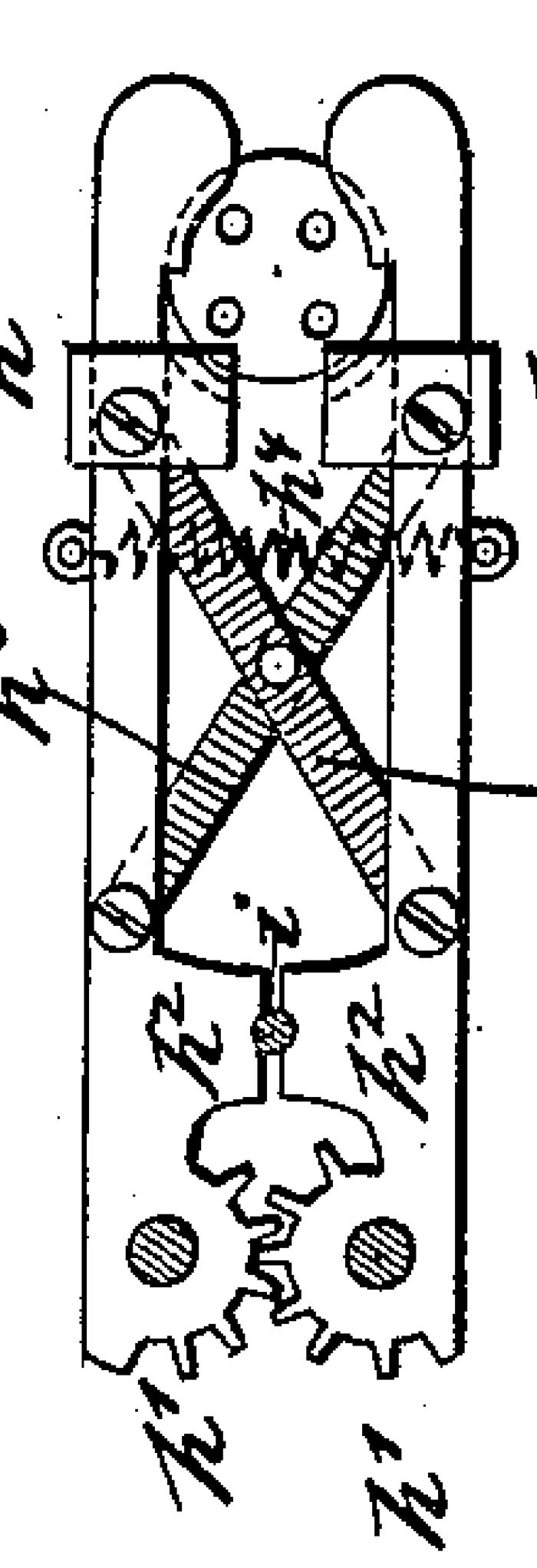

Fig: 3.

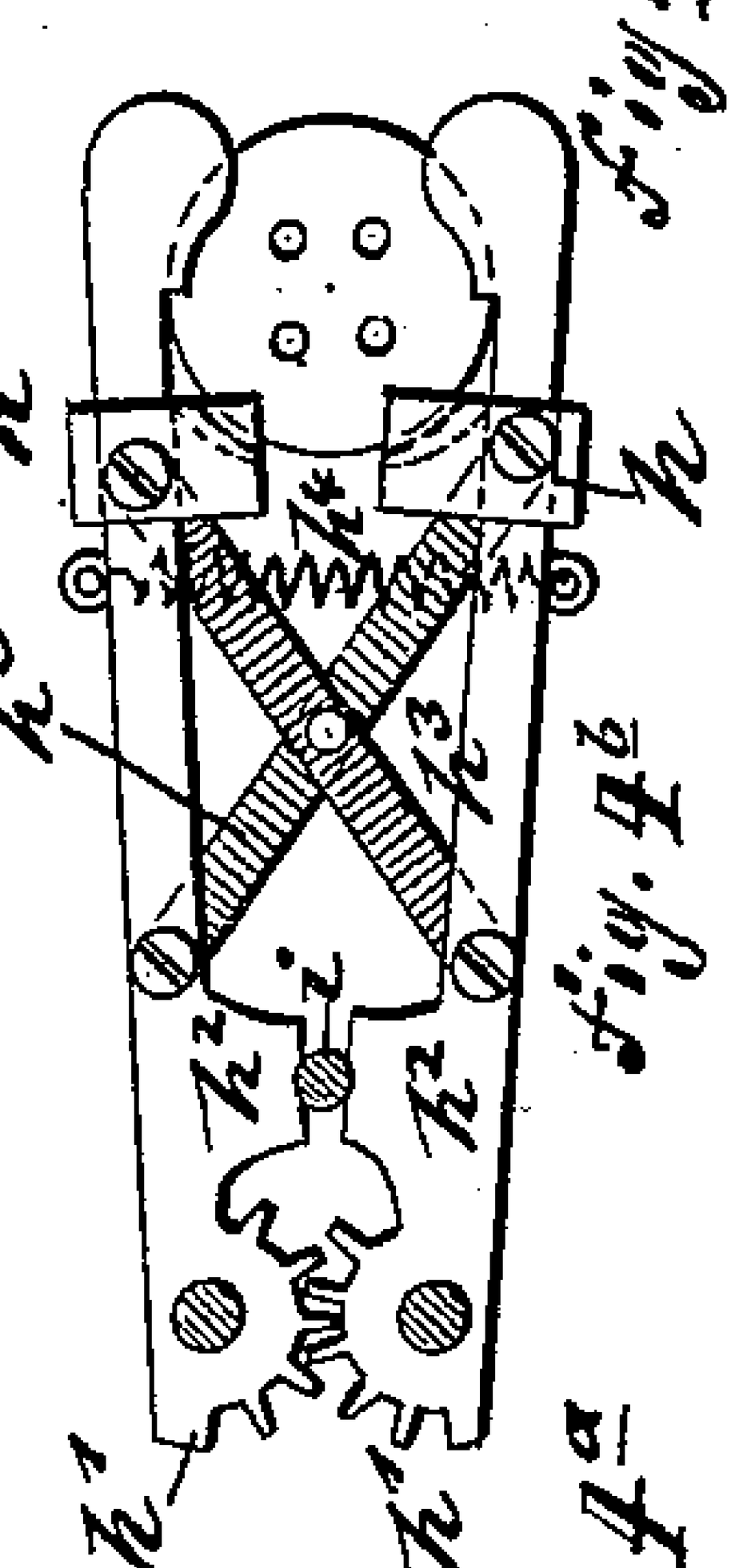

Fig: 4.

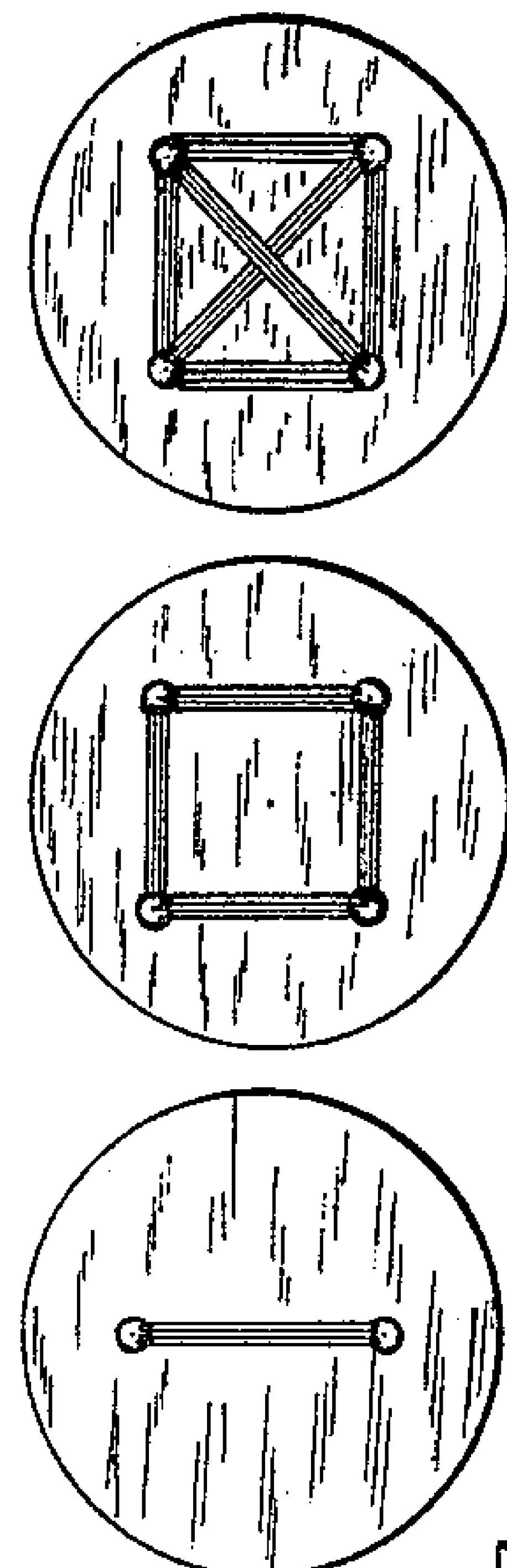

Fig. 4^c Fig. 4^b Fig. 4^a

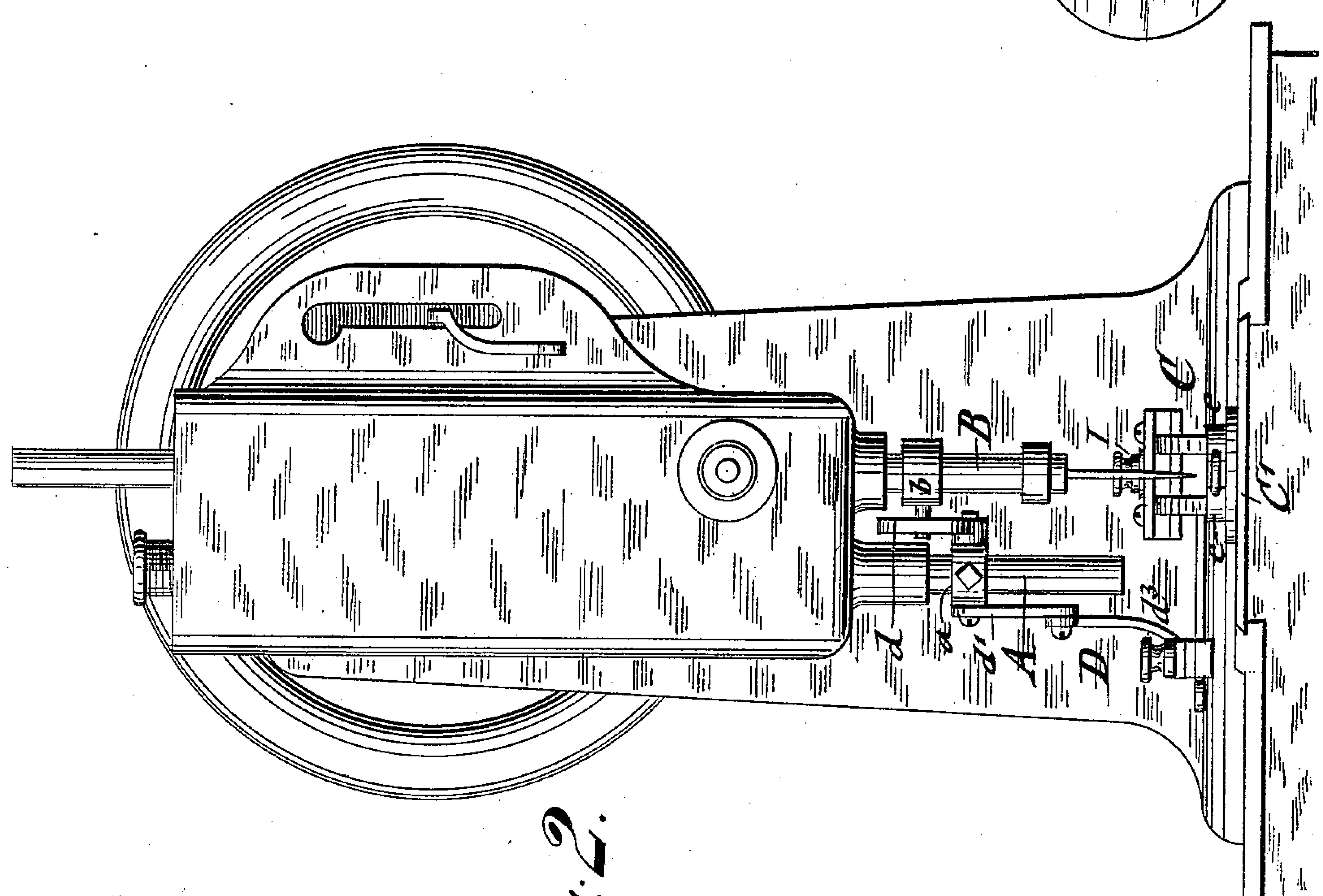

Fig: 2

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(No Model.) 3 Sheets—Sheet 3.

P. SCHOEN.

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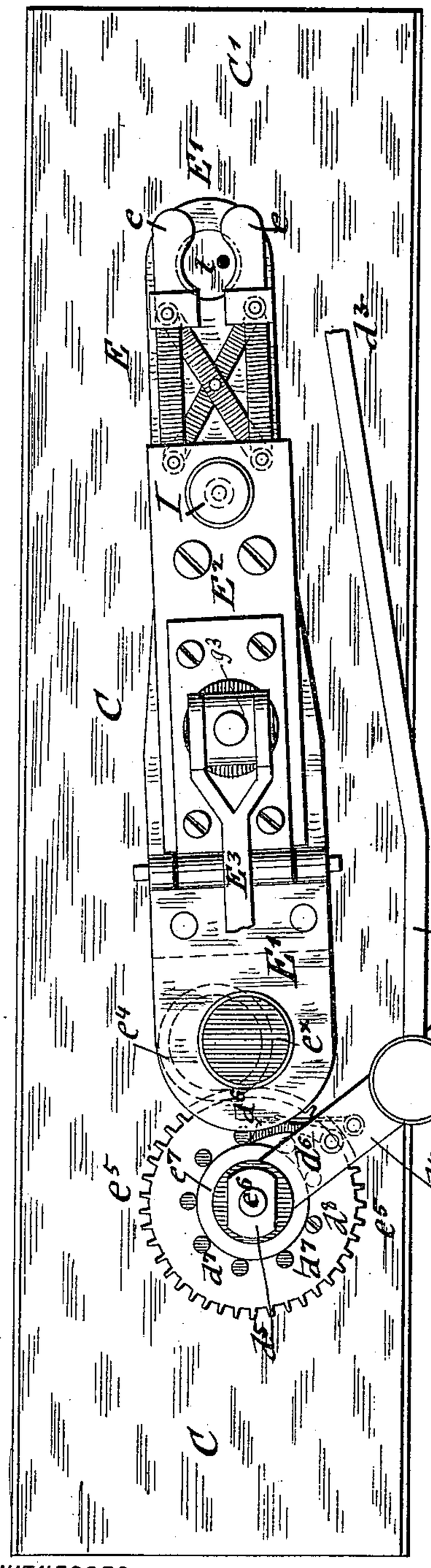

Fig. 5.

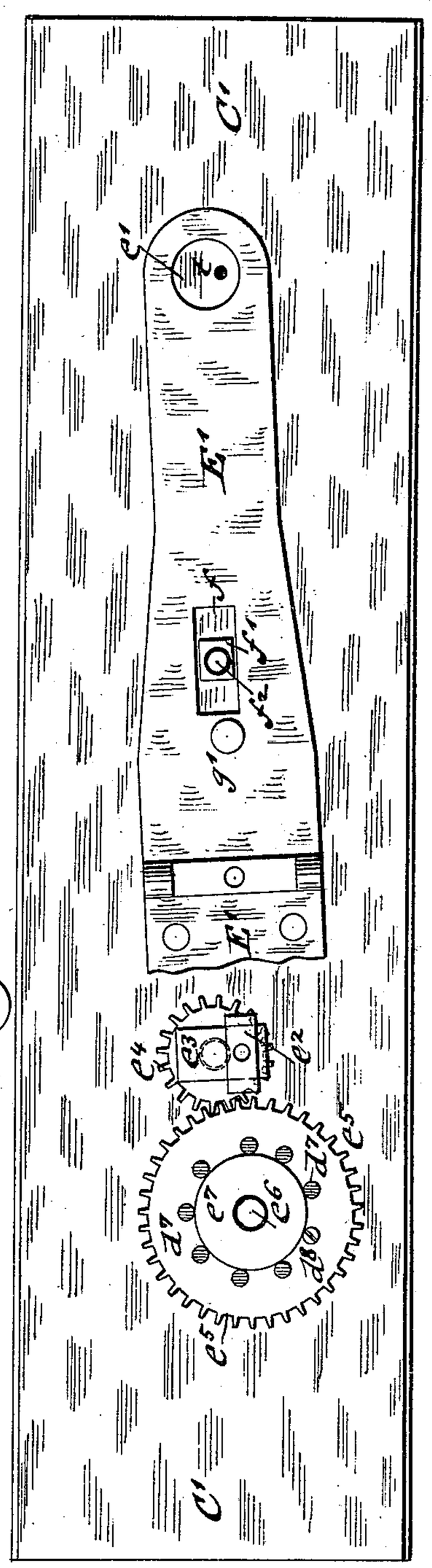

Fig. 6.

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UNITED STATES PATENT OFFICE.

PAUL SCHOEN, OF HOBOKEN, NEW JERSEY.

BUTTON-SEWING ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 464,042, dated December 1, 1891.

Application filed August 5, 1890. Serial No. 361,077. (No model.)

To all whom it may concern:

Be it known that I, PAUL SCHOEN, of Hoboken, in the county of Hudson and State of New Jersey, a citizen of the United States, have invented certain new and useful Improvements in Button-Sewing Attachments to Sewing-Machines, of which the following is a specification.

This invention relates to an improved attachment to sewing-machines of that class by which buttons may be sewed on directly to garments, the improvements being mainly designed with a view to adapt the attachment to sew buttons of any size by means of a simple adjustment of the button-holding parts.

In the accompanying drawings, Figure 1 represents a side elevation of a sewing-machine with my improved button-sewing attachment, the latter being shown in vertical longitudinal section. Fig. 2 is an end elevation of a sewing-machine with my improved button-sewing attachment. Figs. 3 and 4 are top views of the button-holding device, showing the same with two different sizes of buttons. Figs. 4^a, 4^b, and 4^c are top views of buttons, showing the different stitches by which they are attached to a garment. Fig. 5 is a top view of the button-sewing attachment; and Fig. 6 is a top view of the oscillating bottom plate, a part of the same being broken off to show the gearing by which the oscillating motion is imparted to the same.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents the presser-bar, and B the needle-bar, of a sewing-machine of any approved construction.

C is my improved button-sewing attachment, which is operated by a transmitting-lever mechanism D, the main part of which is fulcrumed to a collar *a* of the presser-bar and actuated by the needle-bar B, which engages by a pin *b* a slotted angular arm *d* of the actuating-lever mechanism.

When my improved button-sewing attachment is to be used, the presser-foot is removed and the collar *a* clamped to the presser-bar, while the actuating-pin *b* on the needle-bar is inserted into the slot of the angular arm *d*.

The button-sewing attachment is applied to a main plate C′, which is inserted into ways of a corresponding recess in the table of the sewing-machine, said plate being located below and parallel to the main arm of the sewing-machine.

The button-sewing attachment is composed, mainly, of a button-holder E, which is formed of two button-holding jaws *e e* and of an oscillating bottom plate E′, which is fulcrumed to the plate C′ and provided below the jaws *e e* with a circular opening *e′*, within which is located the throat *t* for the passage of the needle of the needle-bar. The opposite end of the bottom plate E′ is connected by a clamping-jaw e^2 to a dovetailed piece e^3, that is attached to the top part of a pinion e^4, the shaft of which turns in bearings of the main plate E^2, and which pinion meshes with an intermittently-rotating gear-wheel e^5, that turns on a fixed shaft e^6 of the main plate C′. The bottom plate E′ is provided at its middle part with an oblong slot *f*, by means of which it slides along a square guide-piece *f′*, which is applied loosely to a fixed pin f^2, said guide piece and pin serving as a fulcrum for the bottom plate E′, so that the same can be oscillated on the pin f^2 and simultaneously reciprocated on the guide-piece *f′*. The clamping jaw or piece e^2 is attached to the dovetailed piece e^3 by means of a set-screw $e^\times$, which passes through the rear end of the oscillating bottom plate E′ and produces the reliable eccentric connection with the intermittently-rotating pinion e^4. The pinion thus serves the purpose of a crank-wheel, and the set-screw constitutes an adjustable wrist-pin therefor. By means of the set-screw $e^\times$ and clamping-piece e^2 the rear end of the bottom plate E′ can be adjusted nearer to or farther away from the center of the pinion e^4, so that thereby the extent of oscillating motion of the button-holder may be readily adjusted to the distance between the holes of the button and to the size of the stitches by which the button is attached to the garment. The oscillating and reciprocating motion of the bottom plate E′ is produced by the reciprocating action of the needle-bar B and the intermediate lever mechanism D, which latter is composed of the slotted angular arm *d*, that is fulcrumed to the collar *a* of the presser-bar and engaged by the pin *b* of the needle-bar, of an arm *d′*, that is firmly keyed to the fulcrum d^2 of the angular arm *d*, and of a connecting-rod d^3 between the arm *d′* and an oscillating lever d^4, that is

loosely applied to the fixed pivot e^6 of the gear-wheel e^5 and retained on the same by a suitable washer and screw-nut d^5, which latter is applied to the upper threaded end of the pivot e^6, as shown in Figs. 1 and 6. The lever d^4 is oscillated by the action of the needle-bar and the intermediate connecting-lever mechanism $d\ d'\ d^3$ and serves to impart intermittent rotary motion to the gear-wheel e^5 by means of a spring-actuated pawl d^6 that is pivoted to the under side of the lever d^4, so as to engage with a number of studs d^7, preferably nine, that are secured to the gear-wheel e^5. The studs d^7 are arranged equidistantly around a raised circular center portion e^7 of the gear-wheel e^5 and are engaged by the pawl d^6 of the lever d^4, so as to produce thereby the turning of the gear-wheel e^5 and pinion e^4 on their pivots. The arm d' has an intermediate hole $d^\times$, to which the connecting-rod d^3 can be attached, so that thereby the oscillations of the lever d^4 may be made smaller or larger, as required by the stitches by which the button is to be fastened. When a larger stroke is to be imparted to the lever d^4, the connecting-rod d^3 is pivoted to the outer end of the arm d', so that the spring-pawl d^6 of the lever d^4 engages every second stud d^7 and produces thereby a greater oscillation of the button-holder, while when a small stroke is imparted to the lever d^4 the connecting-rod d^3 is pivoted to the hole $d^\times$, so that the spring-pawl d^6 engages every stud d^7 and imparts thereby a smaller oscillation to the button-holder. The intermittent rotary motion imparted to the gear-wheel e^5 imparts an intermittent rotary motion to the pinion e^4 and produces, by the crank connection with the bottom plate E′, a sliding and oscillating motion to the button-holder on its guide-piece f' and pivot f^2. In place of one of the studs d^7 on the gear-wheel e^5 is used a screw-stud d^8, which can be removed and replaced at will. The screw-pin d^8 remains in position when buttons with two or four holes are to be sewed on by means of direct stitches from one hole to the other, as shown in Figs. 4^a and 4^b, while the screw-pin d^8 is removed when a button is to be attached by diagonal stitches, as shown in Fig. 4^c. In buttons with two holes, as in Fig. 4^a, the lever d^4 has made a large stroke by applying the connecting-rod d^3 to the outer end of the arm d', so that the pawl d^6 skips thereby every second stud d^7 and imparts by the proportion between the teeth of the gear-wheel e^5 and pinion e^4 (four to one) half a turn to the latter, whereby the button-holder presents one hole of the button after the other to the needle and forms thereby the stitches between the button-holes.

When buttons with four holes are to be attached, the connecting-rod d^3 is so adjusted as to impart a small stroke to the lever d^4, whereby the pawl d^6 engages every stud d^7 and imparts by the gear-wheel e^5 at each stroke a quarter-turn to the pinion e^4, so that one hole of the button after the other is presented to the needle and regular stitches between the button-holes produced, as shown in Fig. 4^b. When, however, the buttons are to be attached by diagonal stitches, as shown in Fig. 4^c, the screw-pin d^8 is removed and the connecting-rod d^3 set for a large stroke of the lever d^4. This produces the skipping of every other pin by the pawl d^6, so as to impart a half-turn to the pinion e^4 at every stroke of the lever d^4 and form diagonal stitches between two of the button-holes. When the pawl d^6 arrives at the point where the screw-pin is removed, it cannot engage the same, but engages the next adjacent stud d^7, so that the lever d^4 makes only a small stroke and imparts thereby only a quarter-turn to the pinion e^4, so that a stitch is formed from one hole to the next adjacent one. The next stroke of the lever d^4 causes the pawl d^6 to skip the point where the screw-pin is inserted and to engage the stud d^7 on the other side of the same, so as to impart a half-turn again to the button and place it in position again to receive diagonal stitches. When the gear-wheel e^5 has completed its full rotation, the pawl d^6, owing to the absence of the screw-pin d^8, will again impart a quarter-turn to the button, causing a connecting-stitch to be made from one corner hole to the other until the pawl skips this space and turns the button for a half-turn for receiving diagonal stitches, &c., until all the corner holes are connected by single stitches and the diagonal holes by diagonal stitches. In this manner, by the arrangement of the screw-pin d^8 in connection with the stroke imparted to the actuating-lever d^4 and pawl d^6, the button-sewing attachment can be readily adjusted for the different kinds of stitches by which the buttons are to be sewed on.

To a raised standard g of the bottom plate E′ is hinged a plate E^2, to which the shanks of the button-holding jaws $e\ e$ are pivoted. Between the hinged plate E^2 and the bottom plate E′ is interposed on a fixed post g' a spiral spring g^2, which serves to lift the plate E^2 and the button-holding jaws $e\ e$ as soon as a cam-lever E^3, that is pivoted by its forked pad to a sleeve g^3 at the upper end of the post g', is raised, while when the same is placed into the lower or horizontal position, as shown in Fig. 1, the cam at the end of the lever E^3 presses the plate E^2 and the button-holding jaws e in downward position, so that the jaws $e\ e$ are held firmly in contact with the bottom plate E′. The post g' passes through a hole of the hinged plate E^3, while a washer g^4 is interposed between the same and the cam end of the lever E^3, as shown in Figs. 1 and 5, so as to take up the friction.

The button-holding jaws $e\ e$ are so arranged that they can be readily adjusted to hold different sizes of buttons without requiring the changing of the button-holder whenever a button of different size has to be sewed onto the garment or other object. For holding buttons of different sizes so that

their centers coincide the button-holding jaws *e e* are provided with grooves at their inner faces, said grooves holding the button at two opposite points, while the same is held at two additional points of its circumference by the grooved corners of slide-pieces *h*, which are made in the form of sleeves and guided on the shanks of the jaws *e e*, so as to slide forward or backward on the same, according as the jaws are opened more or less apart, as required for the different sizes of button. The rear ends of the shanks of the jaws *e* are provided with toothed segments *h'*, that mesh with each other, which segments serve to produce the joined motion of the jaws when one of them is taken hold of for inserting or removing a button. The shanks of the jaws *e e* are provided near the segments of the same with inwardly-projecting cheeks h^2 h^2, which are engaged by the lower conically-tapering end *i* of an adjusting-screw I, that passes through the plate E^3 and serves to engage the cheeks h^2, so that on turning the screw I in one or the opposite direction, the button-holding jaws *e e* are moved a greater or a smaller distance from each other, so as to adjust them exactly to the required size of button. Simultaneously with the opening or closing motion imparted to the button-holding jaws *e e* by the adjusting-screw I the slide-pieces *h* are moved inwardly or outwardly on the shanks of the jaws *e e* by means of cross-links h^3, which are pivoted to each other and at the ends to the shanks of the jaws *e e* and to the slide-pieces *h*, as shown clearly in Figs. 3 and 4. The button-holding jaws *e e* are further connected by a spiral spring h^4, that is extended transversely from one shank to the other and applied to eyes of the same, so that the jaws are pressed tightly on the button and hold the same reliably in position for the passage of the needle. The jaws and slide-pieces hold the buttons always properly centered whatever be the size of the buttons, which forms an important feature of my construction.

The operation of my improved button-sewing attachment is as follows: A button of the proper size is inserted into the button-holding jaws *e e* by spreading them apart until the button can be inserted and is engaged by the grooves at the inner faces of the jaws and the grooved corners of the slide-pieces *h*. The screw I is then adjusted to the position of the jaws, so that they are held in the required position for the size of the button. The garment or other object to which the button is to be attached is then introduced between the bottom plate E' and the jaws and the latter lowered by the cam-lever E^3. The sewing-machine is then started in the usual manner. By the reciprocating action of the needle, in combination with the oscillating and reciprocating action of the button-holder, the button is sewed on by means of stitches which connect two cross-stitches which connect two diagonal holes of the button, as the case may be. When one button is sewed on, the garment is removed from the button-holder by simply sliding it out of the same, the jaws giving sufficiently by their spring connection to permit the ready withdrawal of the button. A new button is then inserted into the holder and the next sewing operation performed in the manner before described. In this manner buttons can be quickly and neatly attached to garments of all kinds by a comparatively simple attachment to the ordinary sewing-machine without requiring a special machine for this purpose.

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

1. The combination, with a sewing-machine comprising a needle-bar and presser-bar, of an oscillating and reciprocating plate, a button-holder supported thereon, a pinion to which the rear end of said oscillating plate is connected, a gear-wheel meshing with said pinion and provided with ratchet-studs, an oscillating lever carrying a spring-pawl for engaging the studs of the gear-wheel, an arm pivoted to the presser-bar, a connecting-rod between said arm and oscillating lever, and a slotted angular lever attached to the pivot of the arm on the presser-bar and engaged by a pin on the needle-bar, substantially as described.

2. In a button-sewing attachment, a button-holder composed of independently-pivoted laterally-swinging jaws having grooved inner faces, and slide-pieces guided longitudinally on the shanks of said jaws and provided with grooved corners, said corners forming an additional rest for the button and adapting the button-holder for different sizes of buttons, substantially as set forth.

3. In a button-sewing attachment, a button-holder formed of two pivoted and laterally-swinging button-holding jaws having grooved inner faces, slide-pieces having grooved corners guided on the shanks of the jaws, and pivoted cross-links connecting said slide-pieces with the jaws, substantially as set forth.

4. In a button-sewing attachment, a button-holder formed of two pivoted and laterally-swinging jaws provided with grooves at the inner faces of the button-holding jaws, slide-pieces having grooved corners guided on the shanks of the jaws, pivoted cross-links connecting said slide-pieces with the shanks of the jaws, and an adjusting-screw having a tapering lower end for engaging cheeks on the shanks of the jaws, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

PAUL SCHOEN.

Witnesses:
PAUL GOEPEL,
W. REIMHERR.