

No. 634,374.

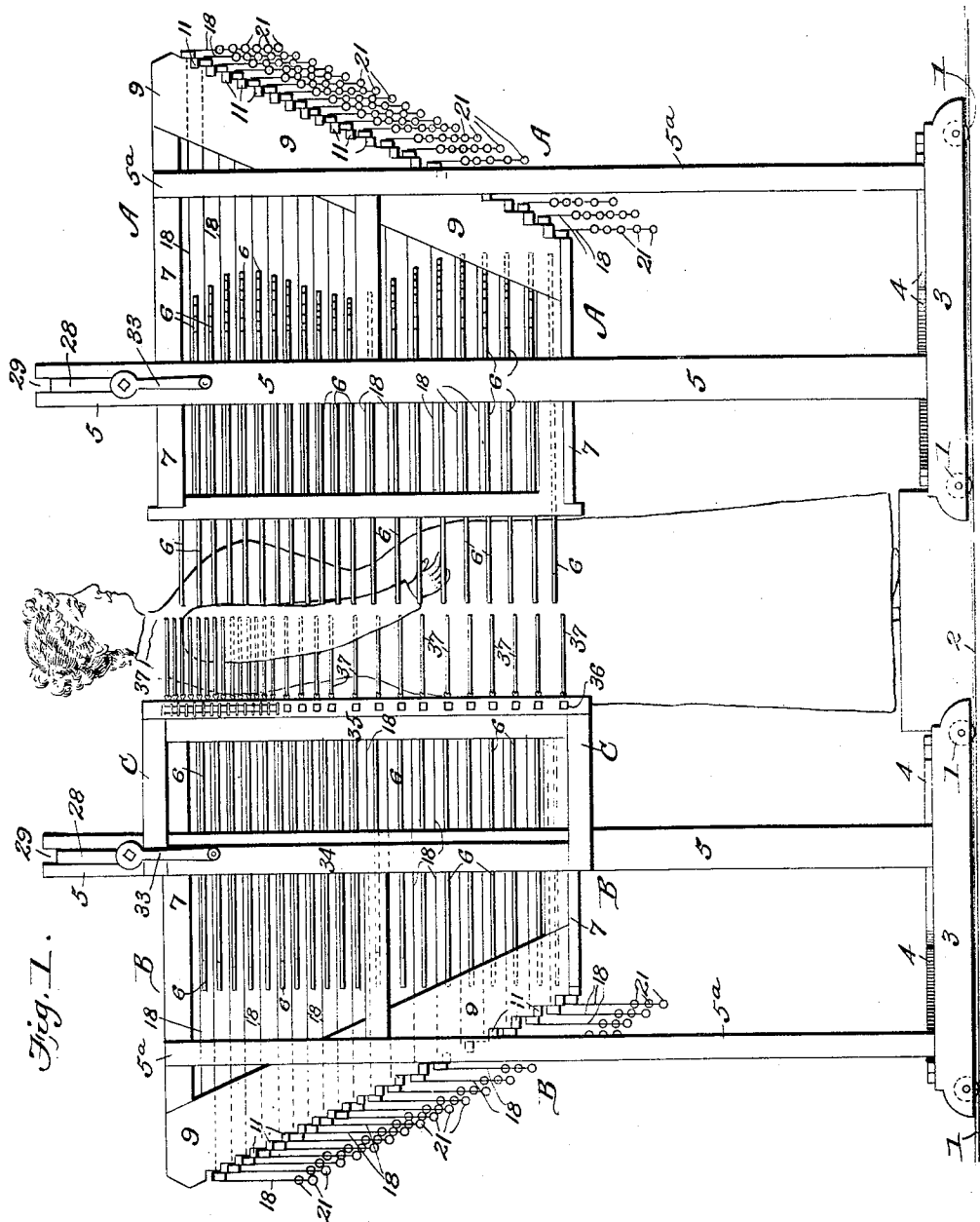
Patented Oct. 3, 1899.

E. STAHL.
CONFORMATOR.

(Application filed Nov. 27, 1897.)

(No Model.)

5 Sheets—Sheet 1.



WITNESSES:

M. D. Bloumel.
Amos M. Hart

INVENTOR

Edward Stahl.

BY *Munn & Co.*

ATTORNEYS.

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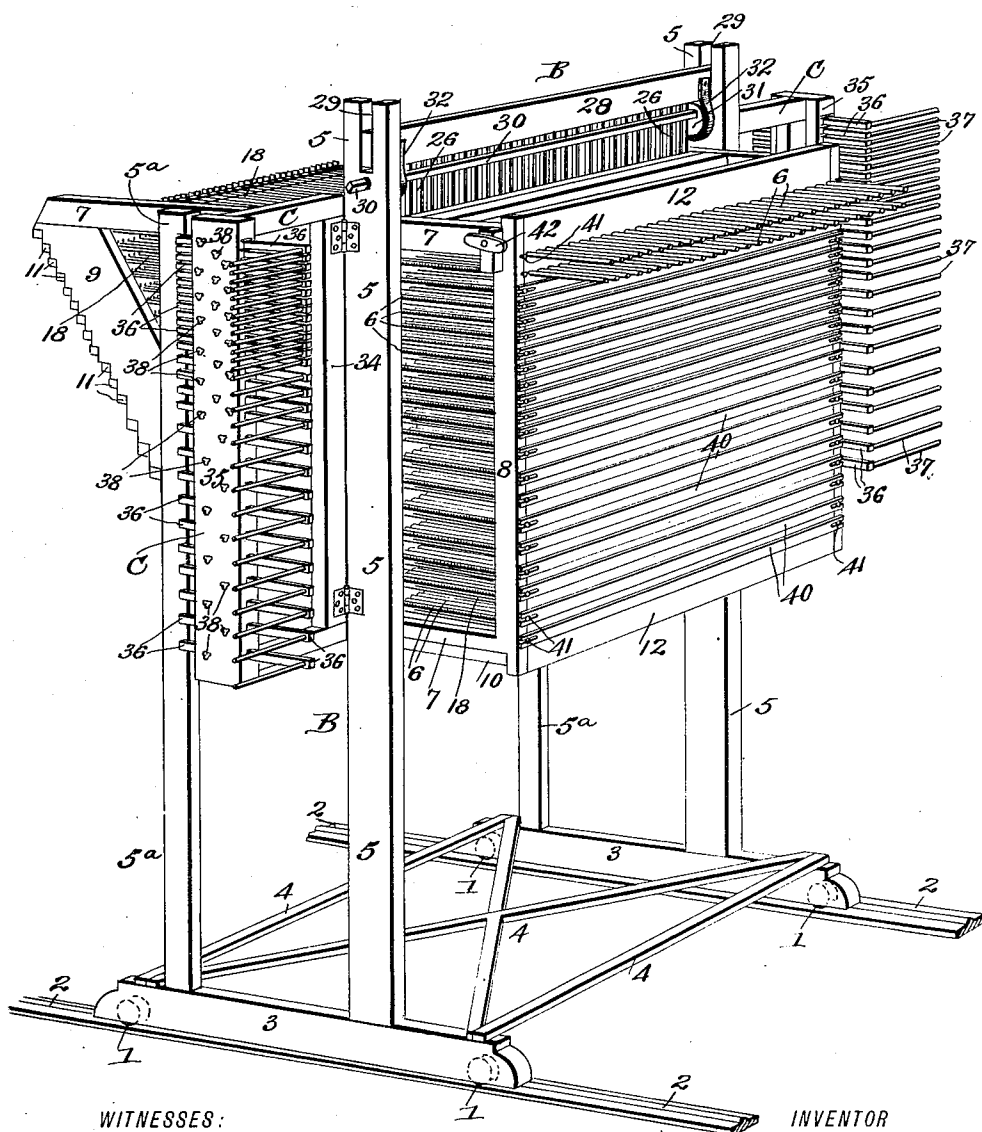
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Fig. 2.



WITNESSES:

M. S. Blondel
Amos N. Hart

INVENTOR

Edward Stahl.

BY *Munn & Co.*

ATTORNEYS.

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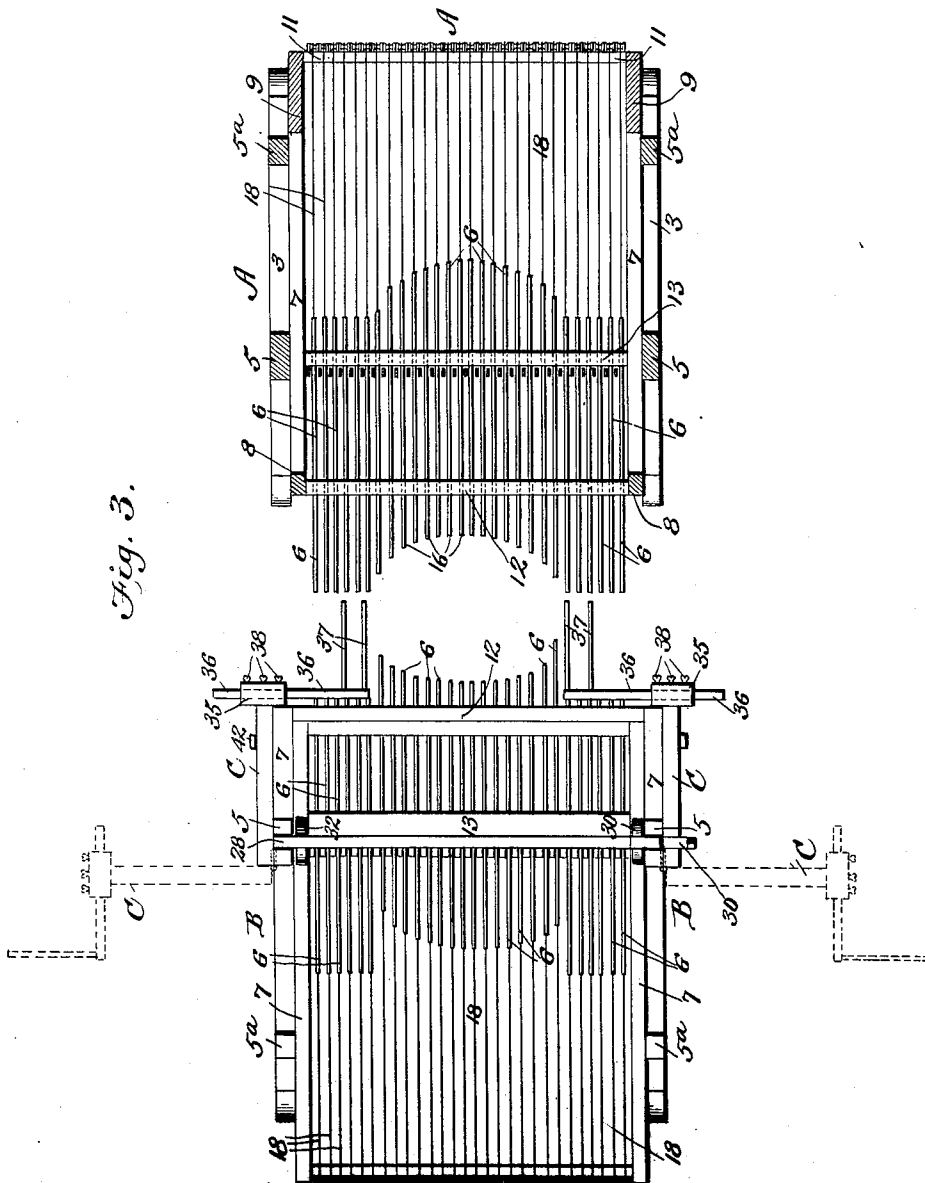
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5 Sheets—Sheet 3.

Fig. 3.



WITNESSES:

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Amos W. Hart

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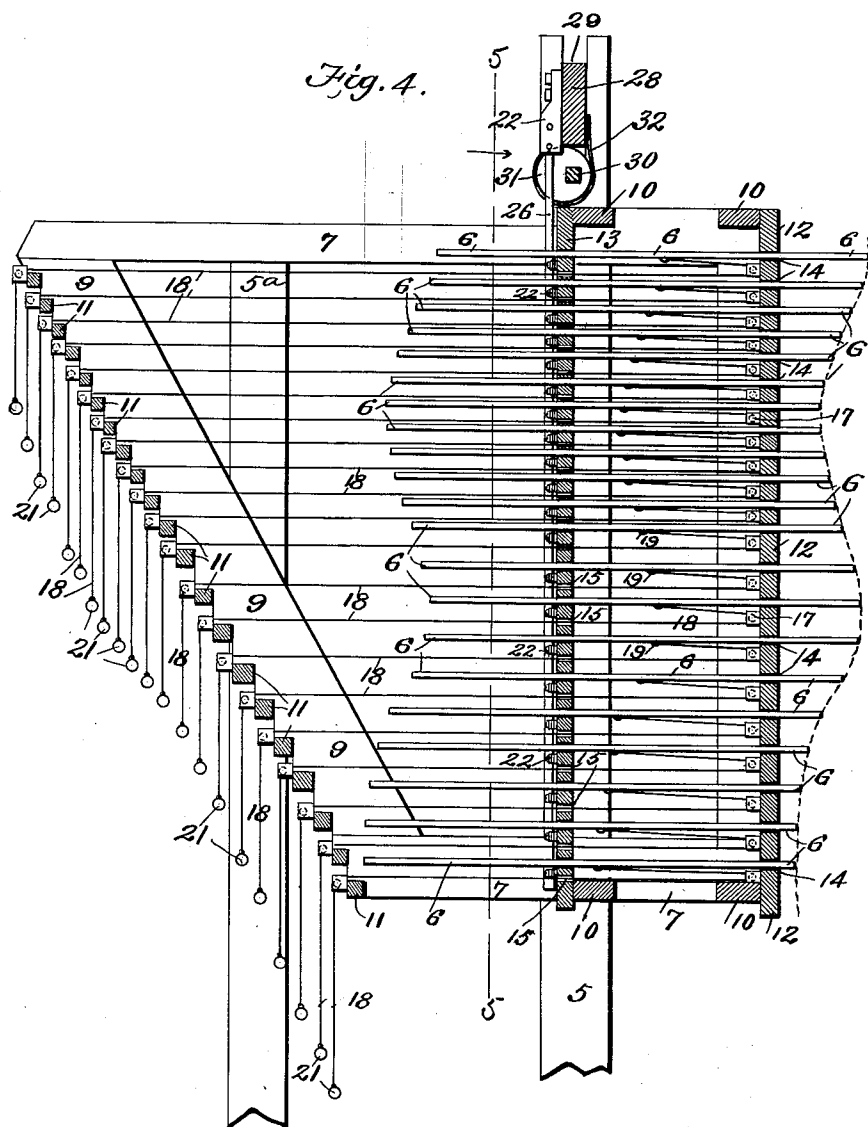
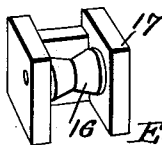


Fig. 8.



WITNESSES:
M. S. Blondel,
Amos Hart

INVENTOR
Edward Stahl.
BY *Munn & Co.*

ATTORNEYS.

UNITED STATES PATENT OFFICE.

EDWARD STAHL, OF NEW YORK, N. Y.

CONFORMATOR.

SPECIFICATION forming part of Letters Patent No. 634,374, dated October 3, 1899.

Application filed November 27, 1897. Serial No. 659,988. (No model.)

To all whom it may concern:

Be it known that I, EDWARD STAHL, a citizen of the United States, residing at New York, (Richmond Hill,) in the county of Queens and State of New York, have invented a new and useful Improvement in Conformators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which like letters and figures refer to like parts in all the drawings.

The object of my invention is to provide an improved means for readily obtaining a mold or matrix of the bust of a living human being or a mold of any other object having an irregular contour, by the aid of which mold a model or "form" may be cast or otherwise constructed that shall be practically a facsimile of the original bust or other object.

In the drawings, (five sheets,) Figure 1 is a side view of both the movable halves or duplicate parts of the apparatus in due position and the slidable pins or rods shot forward, as required, for taking the contour of a human figure. Fig. 2, Sheet 2, is a perspective view of one of the two movable duplicate parts of the apparatus. Fig. 3, Sheet 3, is a plan view of one movable part or half and a horizontal section of the other movable part of the apparatus in the position shown in Fig. 1. Fig. 4, Sheet 4, is a vertical section of one of the movable duplicate parts of the apparatus, the sliding pins or rods being shown projected.

Fig. 5, Sheet 5, is a vertical section of one of the parts of the apparatus on line 5 5 of Sheet 4. Fig. 6 is an enlarged detail vertical section of a portion of one of the movable parts of the apparatus. Fig. 7 is a view showing in detail perspective and section the means for locking the slidable pins or rods. Fig. 8, Sheet 4, is a perspective view of a pulley and its supporting-bracket detached and enlarged.

As shown in Figs. 1 and 3, the main portion of the apparatus is constructed in halves or two parts A and B, which are duplicates, save that one part B has two opposite lateral attachments C, Figs. 2 and 3, which are adapted to be swung into working position for taking the side contour of a bust. Both the parts A B are light skeleton frame structures, which for sake of easy and accurate movement to-

ward and from each other are supported upon small wheels or rollers 1, that run on parallel ways or rails 2. The parts A B being duplicates, I will describe the first only in detail. The base-frame of such part A is composed of side bars 3, rigidly connected by transverse and diagonal bars 4. Four uprights 5 5^a are set on and firmly attached to such base side bars 3 and arranged oppositely in pairs, the rear pair 5^a being shorter than the front 5. The two pairs are suitably braced, as shown in Fig. 1. Between the upper portions of such uprights 5 5^a is arranged the conformator proper, which is composed of a skeleton frame and a part which I term the "pin-case," since it contains and supports the horizontal "pins" or rods 6, employed for determining the contour of a particular bust or other object. The frame of such pin-case is composed chiefly of horizontal top and bottom side bars 7, which are connected at their ends by vertical front bars 8 and inclined rear bars 9 and suitably braced apart by transverse bars 10. The rear edges of said inclined bars 9 are notched and further connected by a series of transverse bars 11, arranged in the notches in such manner that each projects beyond the one below it for a purpose hereinafter stated.

The pin-case proper is composed principally of two thin rectangular boards 12 and 13, arranged vertical and parallel. For convenience and definiteness of description I designate them respectively as the front pin-board 12 and rear pin-board 13. The front pin-board 12 is secured to front cross-bars 10 of the frame and the rear one 13 at a point between the front uprights 5. The pin-board 12 is provided with series of rows of transverse perforations or holes 14 (see Figs. 4 and 6) to accommodate the pins or rods 6, which are adapted to slide therein. Such rows of holes 14 are arranged both horizontally and vertically parallel. The rear pin-board 13 has similar rows of holes 14^a, and the holes of one board register or coincide with those of the other, so that the pins or rods 6 are held horizontal. The rear pin-board 13 has also other series of holes 15 for a purpose to be presently explained.

On the rear or inner side of the front pin-board 12 (see Fig. 6) is a series of rows of pul-

leys 16, one such pulley being located directly beneath each perforation 14. Each sheave or pulley proper is grooved circumferentially, and I prefer to construct it of wood. Its axle is supported in a wooden bracket 17, Fig. 8, which is glued or otherwise attached to the pin-board 12. It is obvious, however, that supports for the pulleys may be variously constructed and attached.

The smaller transverse perforations or holes 15 (see Figs. 4 and 6) in the rear pin-board 13 are arranged each directly under one of the holes 14^a in which the pins or rods 6 slide. Strings or small cords 18 are attached to staples 19 on the pins 6 and pass thence forward over the aforesaid pulleys 16 and back through said holes 15 in the rear pin-board 13 and over pulleys supported on the rear cross-bars 11, weights 21 being attached to their pendent ends, as shown. It is apparent that by this arrangement of parts the weights 21 exert a constant tension on the said cords 18, tending to draw—i. e., to slide—the pins 6 forward. It is further apparent that the step-like arrangement of the cross-bars 11, carrying the rear pulleys, whereby one series of pulleys projects a little further rearward than the one beneath it, enables the weights 21 to hang practically free of each other, so that each weight may be raised or lowered without contact or interference with the adjacent ones.

In the practical operation of the apparatus it is necessary the slidable pins or rods 6 shall be held retracted until the main parts A B of the apparatus shall have been set in due position. For this purpose I employ an automatic fastening and releasing mechanism whose construction is as follows: Each slidable pin or rod 6 is held retracted by pressure of a spring 22, that is arranged beneath it and secured to the rear pin-board 13. (See Figs. 5, 6, and 7.) It is apparent such springs 22 are therefore alined in horizontal and vertical series like the pins. Each spring 22 is composed of a wire, Fig. 7, which is coiled at its middle about a screw 23, that fastens it to the pin-board 13, and its ends 24 25 project laterally and are practically parallel one above the other. One of such ends or arms 24 bears upon the adjacent pin 6, which is above it, and the other arm 25 passes through a transverse hole in a vertical thin metal strip 26. There are as many of such strips 26 as there are vertical rows of pin-holes in the boards 12 and 13, and each is arranged a little to one side of such row in board 13. The coils of the spring 22 turn easily on the screws 23, which are therefore so many pivots therefor, and it is hence apparent that if the strips 26 be raised or lowered the free arms 24 of the springs 22 will be raised or lowered correspondingly, and their pressure upon the slidable pins 6 must be applied or released, and that when thus the pressure of the springs is made to bear upon the pins 6 they will be locked, and when the pressure is relieved they will be released, so that the weighted

cords 18 may slide or shoot them forward. The means for suspending and adjusting the metal strips 26 for this purpose are the following: As shown best in Figs. 5 and 7, the upper end of each strip 26 is secured to a cleat 27, which is in turn screwed to a larger bar 28, that rests in open slots 29 in the uprights 5 of the frame. Such bar 28 is free to be raised or lowered in the slots, and it is obvious the cleat 27 (or cleats) and strips 26 must be raised or lowered with it. To thus raise or lower the bar 28 and its described attachments, I preferably employ a transverse shaft 30, having two cams or eccentric disks 31 keyed thereon. Such shaft 30 is journaled in the uprights 5 directly below the bar 28, and the latter is connected with the eccentrics 31, so as to insure its remaining so by means of straps 32, that encircle the eccentrics, as shown. A crank 33, having a suitable handle, is attached to one end of such shaft 30, and it is plain that by rotating the crank 33 the bar 28 and all its attached strips 26 may be raised and lowered, as required, so that the springs 22 are all acted on simultaneously to bring them into or out of contact with the pins 6 simultaneously. Hence if all the pins 6 had been previously pushed back and locked in that retracted position all may be released at once to allow cords 18 and weights 21 to project them forward.

So far as described the apparatus is designed and adapted to take the contour of the front and back of a bust or other object. It remains to describe the lateral attachment C of part B, in which respect alone the said part B differs from part A.

Referring particularly to Fig. 2, it will be seen the attachment C is duplicated on opposite sides of the pin-case frame and that each attachment is an oblong rectangular frame whose rear bar or stile 34 is hinged, Fig. 3, to an upright 5, so that such frame may swing horizontally. The outer and larger stile or bar 35 of this swinging frame has a series of transverse holes to receive a like series of slidable bars 36, that are provided at one end with pins 37, placed at right angles horizontally to said bars 36. The latter may be clamped by screws 38 in any position to which they may be adjusted.

As shown in Figs. 1 and 2, the number of bars 36 and pins 37 is greater in the upper portion of the apparatus, as required to enable the more irregular portion of the side contour of a bust to be ascertained with the desired precision, and the clamp-screws 38 are therefore arranged in diagonal rows, as shown.

As shown by dotted lines, Fig. 3, the attachments C may be swung back out of the way, and this is their proper position when the parts A and B are first adjusted, as shown in Figs. 1 and 2, to take the contour of a bust. They are subsequently swung inward to the position shown by full lines, Fig. 3, and locked by means of the buttons 42, and then the horizontal pins 37 of the said attachments are par-

allel with the slidable pins 6 of the main part A and B.

The apparatus is used as follows: Let it be supposed that a facsimile model of a woman's bust is to be made and that for this purpose a mold is to be taken of the same. Assuming the sliding pins 6 to be all unlocked and therefore projecting forward beyond the face 12 of the pin-case, the first thing to be done is to shove all the said pins back, which is effected by placing one of the slats 40 (shown in Fig. 2) against one of the horizontal rows of pins 6 and pushing the latter back until the said slat comes in contact with the face 15 of the pin-board 12, then securing the notched ends of the slats by turn-buttons 41, pivoted to the pin-board at the ends of each row of pins. This having been done with one row, the process is repeated until all the pins have been pushed back and are held back by the series of slats. Then by turning either crank 33 in the manner described all the pins will be locked by the springs. This done, the slats 40 are removed and the front faces of 25 both pin-cases are left free. Next the part B of the apparatus is rolled into a desirable position upon the floor-rails 2 and is there fastened by means of bolts that may be dropped into holes extending through the base-pieces 30 and into the rails. Then the woman whose bust-contour is to be taken stands upon a vertically-adjustable block, so that the most prominent part of her back just touches the face of the pin-case and so that the middle vertical line of her back coincides with the middle vertical line of the said face of the pin-case. Then the side attachments C, which had been previously swung backward out of the way, are swung forward into the position 40 indicated in Figs. 1 and 3 and are there locked by means of spring-bolts 42. Next the sliding bars 36 are adjusted so that their transverse pins 37 touch the woman's sides in the manner shown in Fig. 1, and in this position 45 the said bars are fastened by means of the thumb-screws 38. The functions of these side attachments C when thus adjusted are, first, to hold the woman steady in a proper attitude, and, secondly, to furnish a more accurate pattern of the lateral contour of her neck, shoulders, and trunk than the main parts A B of the apparatus would be capable of. The auxiliary attachments C having been thus adjusted, the part A is rolled into position, so 55 that the front ends of its sliding pins 6 will nearly touch those of the part B when the said pins of both parts are drawn forward to their limit of movement, and in this position the part A is also locked upon the floor-rails 2. Everything being now in proper position, a connecting-rod is applied to the handles of the cranks 33, so that by means of this the latter are turned so as to cause the unlocking of the sliding pins 6 and the consequent instantaneous and simultaneous shooting 65 forward of these pins until they have either attained the limit of their motion or

have been stopped by their front ends impinging upon the woman's body. This movement of the pins having taken but a moment, 70 in the next moment the cranks are turned in the opposite direction, so that the springs 22 relock the pins 6. At this stage the appearance of the apparatus will be that shown in Figs. 1 and 4. As soon as the pins have been 75 relocked the parts A and B are drawn in opposite directions away from the woman, who is then free to step off of the block. It is plain that the contour presented by the front ends of the sliding pins or rods 6 forms, practically, two semimolds of that portion of the woman's figure on which the pins impinged. To make use of these semimolds for the purpose of constructing a model, the next thing 80 to be done is to take a sheet of paper of suitable size and by means of a flat board hold it against the ends of the pins 37 of the side attachments C C and with a pencil mark upon it the points where the inner edge and the ends of the pins intersect. This sheet 85 will then indicate the exact lateral contour of the woman's figure. This done, sheets of paper of proper size and with at least one straight edge are taken and one of them inserted between any two consecutive rows of the sliding pins 6, so that the said straight edge 90 of the sheet touches the face of the pin-board, and then the position of the front ends of one of these rows of pins is marked by a point upon the sheet. This marking operation is repeated 95 as many times as there are horizontal and vertical rows of pins in the two parts A and B, whose ends have been in contact with the woman's body. This, it will now be understood, affords a considerable number of sheets, 100 either of which bears the marks indicating the peripheral shape of a half-section of the said body, and by then joining the marks upon each sheet by lines of even sweep and cutting the sheets through such lines a number 105 of patterns are obtained of the body or figure, by the aid of which any good mechanic at all familiar with work of that nature can readily construct a model which will be practically a facsimile of the original. 115

I am aware that devices for taking the contour of parts of the human body by means of sliding pins have been invented; but upon examination of them it will be found that all 120 which any is capable of is to furnish at one operation what can only be considered as an equivalent of the peripheral shape in one plane or line and not at one time of an entire undulatory outline or figure. Such a device is useless for the purpose of constructing a model such as here contemplated. 125 For if it should seem, upon first thought, that it would only be necessary to take a sufficient number of separate consecutive outlines in order to arrive at the same result as that intended to be obtained by means of my apparatus it will appear upon reflection that this 130 is impossible, for the simple reason that the bust portion of a human being is never ab-

solutely the same for two seconds at a time, there being always motion of some kind, and outlines of different sections of the same taken consecutively could not possibly be correct in their relation to one another, even if it were not equally impossible to shift a device consecutively, so as to get the outlines of sections parallel with one another.

In my apparatus, as has been clearly shown, the peripheral outlines of all the sections are secured simultaneously and instantaneously.

A great advantage in my apparatus is that weights are used as actuators of the sliding pins instead of springs. Were the latter made use of they would after being compressed to the necessary extent give such an impulse to the sliding pins that in view of the large number of the latter their combined stroke upon the body could not be endured, while by using weights the latter can be so regulated that the impingement of the pin ends will be but little felt.

What I claim is—

1. A conformator for the purpose specified, comprising two movable parts or upright frame structures supported and adapted to move toward and from each other on the same horizontal ways, two boards having numerous rows of transverse and coincident holes and arranged vertically parallel in each such part or structure, also at right angles to the direction of movement of the latter, pins or rods arranged horizontally in such holes of the respective pin-boards and adapted to slide therein, cords attached to said pins and extending forward of the point of attachment and over a device fixed in the frame, thence back over a rear guide, and having weights attached to their pendent outer ends, as shown and described to operate as specified.

2. In a conformator for the purpose specified, the combination with the rods, adapted to slide horizontally in guide-holes, of a series of independent wire springs curved about a pivotal support, the said springs being arranged beneath the rods and pressing thereon as specified, and devices connected with the several springs in each row for simultaneously relieving their pressure when required, as shown and described.

3. In a conformator the two rear pin-boards having two sets of holes which are axially at right angles with the flat sides of the said boards, and diametrically, so placed relative to one another, that they form two sets of straight parallel rows, of which one set extends in a horizontal direction, and the other in a vertical direction, pins or rods adapted to slide in the holes, the said boards being provided upon their rear sides with springs arranged as described, one for and adjacent to each one of the pin-holes, a vertically-movable metal strip placed alongside of each vertical row of holes, and connecting the springs situated upon the same line with the said holes, and means for adjusting said strips for caus-

ing the springs to grip or release said pins, substantially as and for the purpose set forth.

4. In a conformator for the purpose specified, the two pin-cases, each comprising a skeleton frame, a front pin-board and a rear pin-board, perforated with holes arranged in vertical and horizontal rows, cross-bars affixed to the rear edge of the frame, pulleys secured upon the rear side of the front pin-board and upon the said cross-bars, springs secured upon the rear side of the rear pin-board, and metallic bars or strips connecting in vertical rows, the aforesaid springs, and means for adjusting the strips, substantially as and for the purpose set forth.

5. In a conformator, the combination of perforated vertical pin-boards and a series of pins or rods adapted to slide in the perforations thereof, springs arranged adjacent to such pins and adapted to bear thereon, vertically-movable metal strips, that engage said springs, vertically-adjustable cross-bars to which such strips are connected, and means for raising and lowering such bars to actuate the springs for locking or releasing said pins, substantially as shown and described.

6. In a conformator, the combination with boards set vertically and having rows of holes, as specified, a series of horizontally-slidable pins or rods arranged in such holes, a device placed adjacent to each such pin, metal strips for acting on said devices to cause them to grip or release the pins at will, means for raising or lowering the said strips, a series of bars arranged stepwise at the rear of the frame so that each projects beyond the one below it, a series of pulleys on such rear bars, and weighted cords attached to the pins and passing over pulleys arranged on the rear of the front pin-board and over the pulleys on the rear cross-bars, as shown and described.

7. In a conformator, the two auxiliary side attachments of one of the parts of the apparatus, each of the said attachments being composed of a front bar or stile, a rear stile, and connecting cross-bars, the front stile being provided with holes, bars arranged slidably in said holes and each provided at one end with a pin arranged at a right angle to the bars, the said front stile being provided with thumb-screws by means of which the said sliding bars may be fastened in place, and the said attachments being hinged to the part B as described whereby they may be swung into or out of a required position, and that their front stiles stand vertical, and the sliding bars with their pins are longitudinally in horizontal planes, as and for the purpose set forth.

8. In a conformator, for the purpose specified, the combination with suitable supporting-frames, and slidable pins or rods for taking the contour of the front or back of a bust or other object, of a side attachment composed of movable frames and slidable pins carried therein and adapted to be brought

into contact with the side of such bust or other figure, substantially as shown and described.

9. The combination with the slidable rods, and the pin-board having turn-buttons arranged in vertical rows thereon, of slots having their ends provided with open slots or notches, as and for the purpose specified.

10. A conformator comprising a suitable frame having a series of horizontal guide-holes, a series of horizontal rods or pins which are freely slidable in such holes and adapted to project on the face of said frame as specified, a series of guides or rollers arranged on the frame, one directly beneath each rod or pin, weighted cords passing over said rollers and attached one to each rod or pin in rear

of the adjacent guide, and a series of rollers arranged at the rear of the frame, to support the cords, substantially as shown and described. 20

11. In a conformator, the combination of the slidable pins, means for actuating the same longitudinally, spring-wires having a pivotal support and arranged at one end to engage their respective pins, a bar or plate engaging the other ends of the spring-wires whereby to put the same under tension to lock the pins and means for operating the said plate or bar substantially as set forth. 30

EDWARD STAHL.

Witnesses:

FRANCIS D. HAINES,
JESSIE ONDERDONK.