3 Sheets—Sheet 1.

F. H. ULLRICH.

APPARATUS FOR DRAFTING TAILORS' PATTERNS.

No. 169,744. Patented Nov. 9, 1875.

Fig: 1.

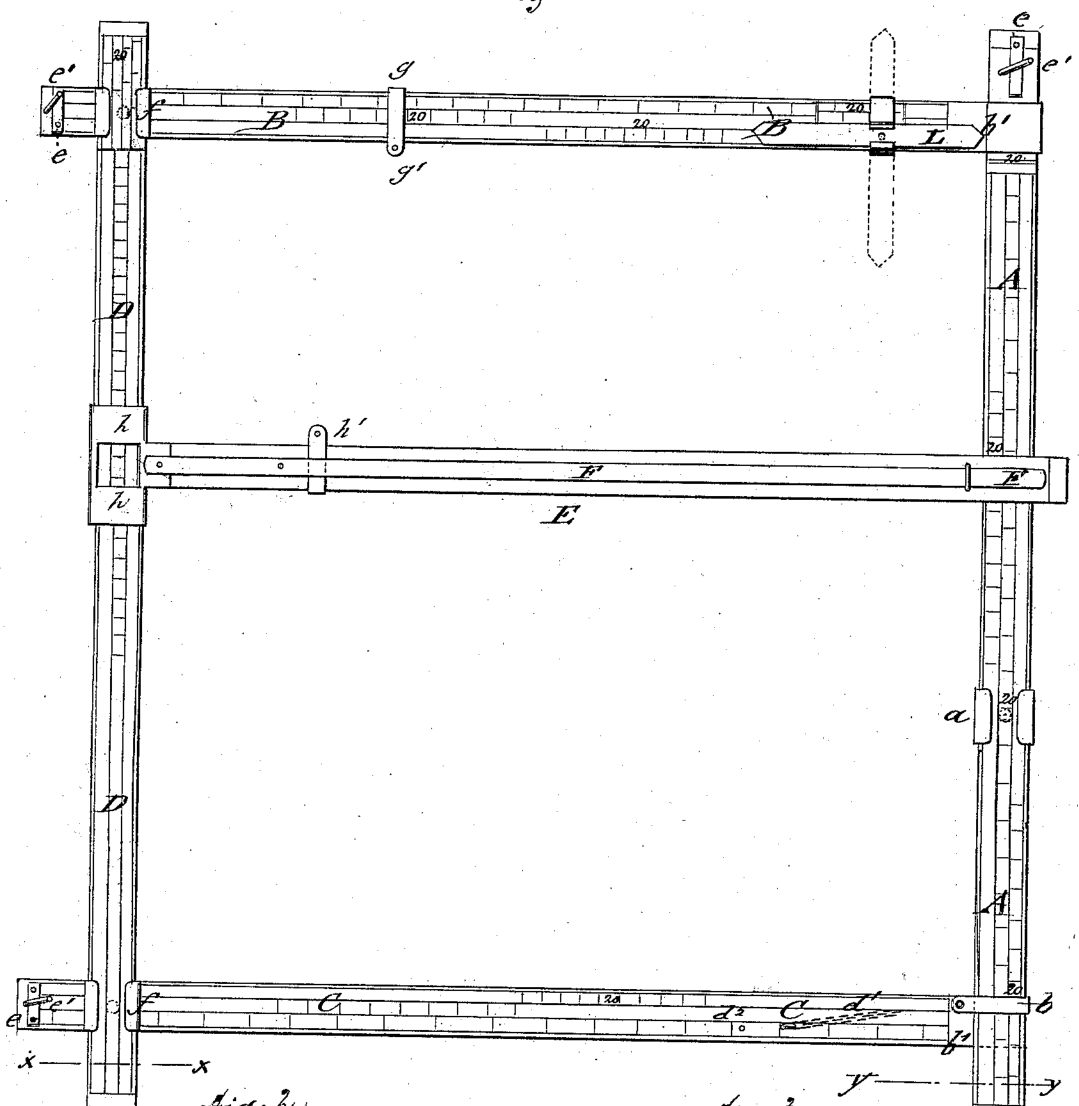


Fig: 2.

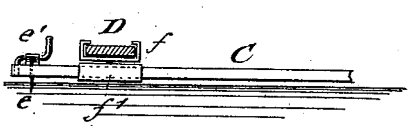
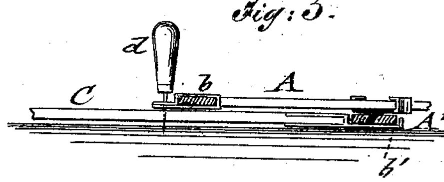


Fig: 3.



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3 Sheets—Sheet 2.

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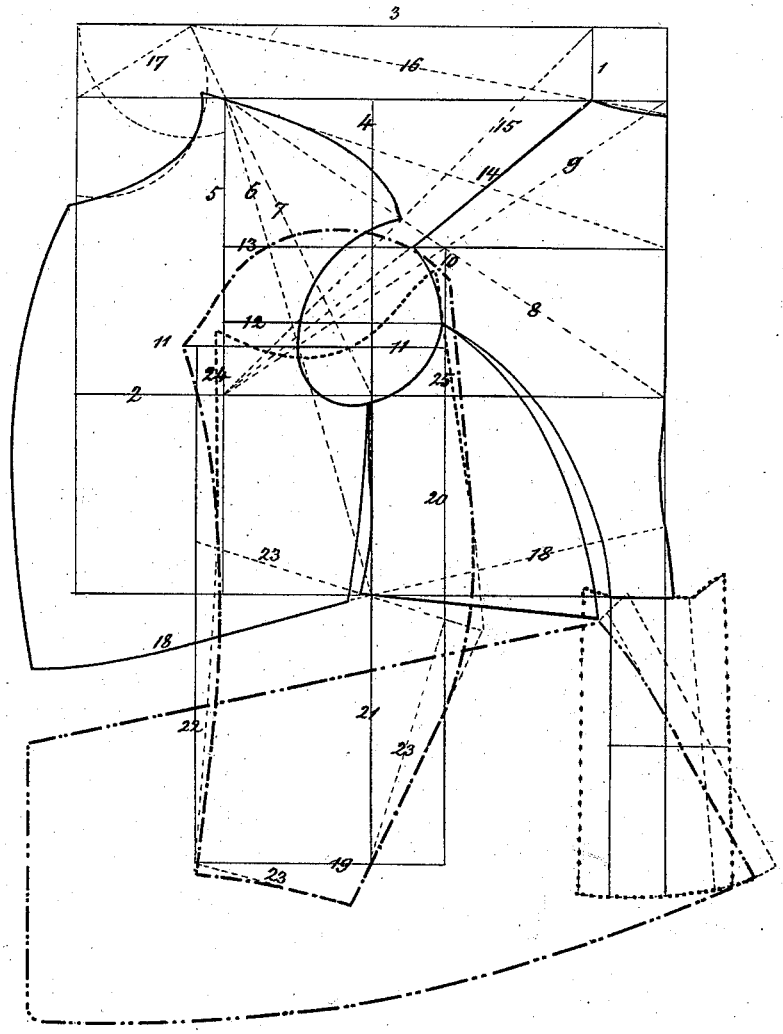
Fig: 1.



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3 Sheets—Sheet 3.

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APPARATUS FOR DRAFTING TAILORS' PATTERNS.

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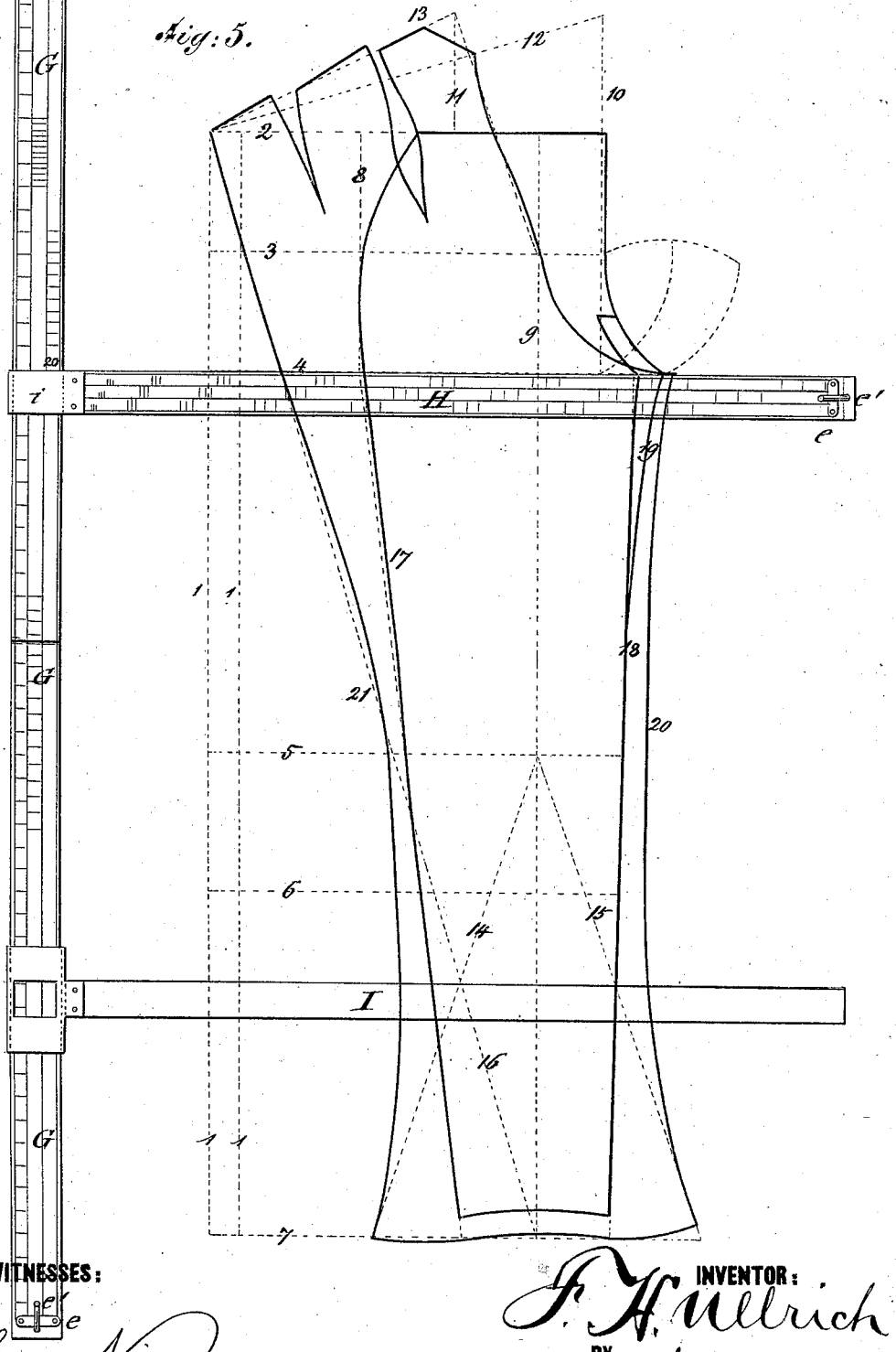
Fig: 5.



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UNITED STATES PATENT OFFICE

FRIEDRICH H. ULLRICH, OF NEW YORK, N. Y.

IMPROVEMENT IN APPARATUS FOR DRAFTING TAILORS' PATTERNS.

Specification forming part of Letters Patent No. **169,744**, dated November 9, 1875; application filed August 6, 1875.

To all whom it may concern:

Be it known that I, FRIEDRICH H. ULLRICH, of New York city, in the county and State of New York, have invented a new and Improved Apparatus for Drafting Tailors' Patterns, of which the following is a specification:

The object of my invention is to furnish to tailors, for the purpose of cutting any garment in accurate and well-fitting manner, an improved apparatus for drafting the patterns for coats, vests, and pants in a mechanical and readily-acquired manner, so that, with some practice, almost any one is enabled to cut a well-fitting garment, dispensing thereby, to some degree, with the services of highly-paid cutters, and reducing the art of cutting to an easily-comprehended and simple device, as compared to the intricate and confusing method hitherto in use.

The invention is based on the normal anatomical proportions of the different parts of a body, in connection with a system of measuring that indicates the deviations from the normal form, the measures to be plotted by a series of squares corresponding to the proportions of the body, and an apparatus with graduated and adjustable parts, for defining and drafting said measures.

The invention consists, mainly, in an apparatus for drafting the patterns for cutting out the garments, which apparatus is made of a number of graduated and adjustable pieces, which, when properly connected and secured, gives the different construction points and lines, according to the measures of the body.

The method of drafting by means of the apparatus consists in constructing the patterns according to the proportions of the body, as given by the measurements, and a system of auxiliary squares and lines for obtaining the different main and subordinate points of the patterns.

In describing the invention I will first fully describe the apparatus, and then point out the mode of using the same.

For the purpose of illustrating my invention, Figure 1 of the accompanying drawings represents a top view of the apparatus, with the parts in position for drafting a coat or vest; Figs. 2 and 3, detail sections of the same, respectively on lines *x x* and *y y* of Fig. 1; Fig. 4, a diagram of coat-patterns constructed thereby; and Fig. 5, a top view of the apparatus, and a diagram for drafting the pants-patterns.

Similar letters of reference indicate corresponding parts.

In the drawing, A represents the back-rule; B, the neck-rule; C, the waist-rule, and D the front-rule, which comprise the main parts of my apparatus for drafting the coat-patterns. The back-rule A is connected, by a slide-clasp, *a*, with a chest-rule, A′, of shorter length, pivoted to the under side of clasp *a*, the chest-rule being adjusted on the back-rule A, which may be set on the pivot of clasp *a*, to one side or the other of chest-rule, according as the body is of greater or lesser forward or backward inclination, and increases or decreases the length of the back-line from neck to waist over the normal position, which is represented when the back-rule A and the shorter auxiliary rule A′ are coinciding. A sliding waist-indicator, *b*, of the back-rule is set to the length of the back from neck to the intersection of the hip or waist line with the spine, which intersection forms the waist-point. The back-rule A is graduated centrally in centimeters or other unit of measure, and at one side with the different lengths of the back, and at the other side with the lengths of the back-chest point from the neck-point. The shorter or chest rule A′ is set by its clasped piece *a* to the measured length of the chest, and the waist or hip indicator to the length of the back below the same. The waist and neck rules C and B are then attached by end clasps *b′* to the chest-rule A′ and the back-rule A, forming fixed right angles therewith. The connection of the back-rule and waist-rule may be firmly fixed for a normal body by passing a fastening-pin, *d*, applied to a small chain, d^1, to the waist-rule through perforations of the sliding hip-indicator *b*, and of the end of the waist-rule C, as shown in Fig. 3. When, however, back and chest rules A A′ do not coincide, the pin is passed through a perforation, d^2, of the waist-rule C, to fix and retain rigidly the position of the same, and that of the lower chest-rule A′. The upper end of the back-rule A, as well as the outer end of the waist and neck rules C

and B, is provided with spring-pins *e*, that pass through perforations of the rules to the base-board below, and serve thereby to fix the apparatus firmly in position for plotting the different points and measures after the different rules have been set into their relative positions.

The spring-pins *l* are retained in position by pivoted wire clasps or holders *e'*, that prevent the release of the pins until removed from the same. The lateral waist and neck rules are graduated in analogous manner at the back to set off the waist and neck measures, the centimeter or unit scale being, however, at the outer sides, while the other scales are arranged at the inside of the rules. The front-rule D slides in two clasps, *f*, which are pivoted to base-clasps *f'*, sliding on the lateral waist and neck rules. These double clasps *f f'* admit the easy adjustment of the front-rule D, which forms thereby, with the back, neck, and waist rules A B C, the figure of a square, in case the back and chest rules A A' coincide, while its angles therewith are somewhat changed by means of the pivoted points of clasps *a* and *f f*, when, by the deviations of the back length from the normal length, the neck-point is thrown to one side or the other of the normal back-line, so that in such cases a figure with five sides is formed, as an oblique angle is produced by the back and chest rules at the pivot-point of clasp *a*. The rectangular connection of back and chest rules, respectively, with the neck and waist rules is always retained, while the forward or backward inclination of the body from the normal position is indicated by the deviation of the angles of the neck and waist rules with the front-rule, and the production of the oblique angle between back and chest rules. At the ends of the back-rule A, neck-rule B, and front-rule D are small reduction-scales, the figures of which correspond to those given by a scale on the back-rule, as found by the position of the waist-indicator *b*. This scale indicates the measure of the body around chest and arms.

The reduction-scales serve, first, to give the position of neck-rule on the back-rule; secondly, to define the length and end point of the back neck-circle, which is obtained by drawing through the corresponding figures of the reduction-scales of the neck and front rules parallel lines with the back and neck rules, until they intersect each other, and describing, then, a square from this intersection with the distance of the reduction figure on the neck-rule from the back-rule by measuring the same downward along the shorter parallel line of the neck. The point obtained thereby is the end of the neck-circle, and the diametrically-opposite corner of the square erected thereon toward the back-rule, the point to which the corner of the back and neck rules has to be moved. Accordingly as the neck is longer or shorter, the end point of the neck-circle falls above or below the original position-line of the neck-rule, and the apparatus is then changed from the original position by swinging on its pivoted points, so that back and neck rules correspond to the neck-line so obtained. The waist-rule and chest-rule retain their original position; but the remaining rules either diminish or enlarge the surface inclosed by them in proportion as the end point of the neck-circle is thrown above or below the normal neck-line and the neck-point, and consequently the back-rule is thrown to the inside or outside of the original back-line. The front and back rules retain their parallelism after the position of the apparatus has been changed to the neck-points, as found by construction.

For the purpose of simplifying the defining of the neck-point by the reduction-scales, and admitting the dispensing of such a scale on the front-rule, a swinging slide-piece, L, is applied by a slide-clasp to the reduction-scale of the neck-rule B, to set off the parallel to the back rule. The slide-piece L is then swung over to the back-rule, and the distance from the same taken by adjusting the end of slide L to the back-line. Slide L is then swung up again into parallel position to the back-rule, the end point determining the corner of the square for producing the neck-points, in the same manner as before described.

The apparatus is now firmly fixed into position by the fastening spring-pins at the ends of the rules, the fixed position of the waist-rule and chest-rule having been retained by the detachable pin *d*.

The neck-rule B is provided with a sliding neck-indicator, *g*, that is set on the neck-point, as given by the graduation thereon. An upward-extending pin, *g'*, serves for inserting a perforated rule, F, by which the different construction-lines radiating from the neck-point may be drawn, as shown in the diagram, Fig. 4. Rule F serves further to draw the diagonal and other construction lines, while a T-rule, E, that slides by a recessed clasp, *h*, along the front-rule, serves to produce the different lateral construction-lines for the chest, shoulder, and other points. A sliding indicator, *h'*, of similar construction as the neck-indicator *g*, is applied to T-rule E, for facilitating in the same manner the use of rule F.

After use, the rule F may be attached by pin and staple, or other retaining device, for being always handy for use. As the graduations of the different rules correspond by computation with that of the back-rule, it is obvious that the figures found thereon by the given length of the back are used on all the rules, for determining, by the help of the construction-rules E and F, the points and lines required for drafting the shapes of the patterns. This serves as a mechanical guide for the construction of the pattern, one of these construction figures being shown in the apparatus in Figs. 1 and 5, for the purpose of illustration. The consecutive order of the construction-lines is indicated by numbers 1, 2, &c., in the diagram, Fig. 4, which will enable any one con-

versant with drafting patterns to readily construct the normal coat-pattern shown thereon, and in analogy thereto the patterns varying therefrom, according to the inclination of the body.

The apparatus for drafting the pants-patterns is based on the same system as that for drawing the coat, but is simpler in construction, and consists of a leg-rule, G, giving the length from the hip-joint to the heel, and of a seat-rule, H, that slides by a clasp, *i*, at right angles to the leg-rule G, and gives the size of the pants over the seat. The leg-rule may be made as extension of front-rule D, or otherwise connected thereto, to be used in connection with, or separately from, the coat apparatus. The ends of the leg and seat rules G and H are fixed by fastening spring-pins *e e'*, in the same manner as the rules for the coat-pattern, and by the computed graduation of leg and seat rules the construction points and squares are determined. The hip and abdominal lines are drawn above the seat-line, and the knee, calf, and heel lines below the same, an auxiliary T-rule, I, with recessed slide-clasps, being used for drawing the same. The center line of the pants and the longitudinal construction-lines are drawn parallel to the leg-rule—an additional rule, sliding at right angles to the seat or T rule, being employed, if desired, for greater convenience.

The drafting of the construction-lines is indicated on the pattern diagram for the pants, in Fig. 5, in the same manner as on the diagram for the coat, by consecutive figures, by which the mode of laying out the patterns is readily understood. When the patterns are completed, they are transferred to pattern-papers by a perforating-machine, or directly on the cloth, to be finally cut out for being made up.

The entirely mechanical process of drafting can be readily learned, and thereby the cutting of garments facilitated, and their exact fit produced. As in most cases the body is not of symmetrical shape, but of more or less unequal development in the shoulder or hips, patterns have to be constructed for each half of the coat, vest, or pants, for producing the perfect fit of the garments.

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

1. The back-rule A, in combination with sliding and swinging chest-rule A', joined by a pivot-clasp, *a*, for the purpose described.

2. The combination of back-rule A, having sliding hip-indicator *b*, with the waist-rule C and the fastening-pin *d*, for securing fixed position of the rules, as set forth.

3. The combination of back-rule A and chest-rule A' with neck-rule B and waist-rule C, having clasp ends *f f'*, as and for the purpose described.

4. The neck-rule B and waist-rule C, attached to the front-rule D by double sliding and swinging clasps *f f'*, in combination with the back-rule A and swinging chest-rule A', to allow the adjustment of the rules on the pivot-points of the double clasps and of the chest-rule, substantially as and for the purpose set forth.

5. The end points of the apparatus, provided with fastening spring-pins *e e'*, for securing same in fixed position after adjustment, as specified.

6. A sliding indicator, with pivot-pin, in combination with the perforated construction-rule, for facilitating the drawing of the construction-lines of the patterns, as set forth.

7. The neck-rule B, provided with swinging slide-piece L, for determining neck-points, as set forth.

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