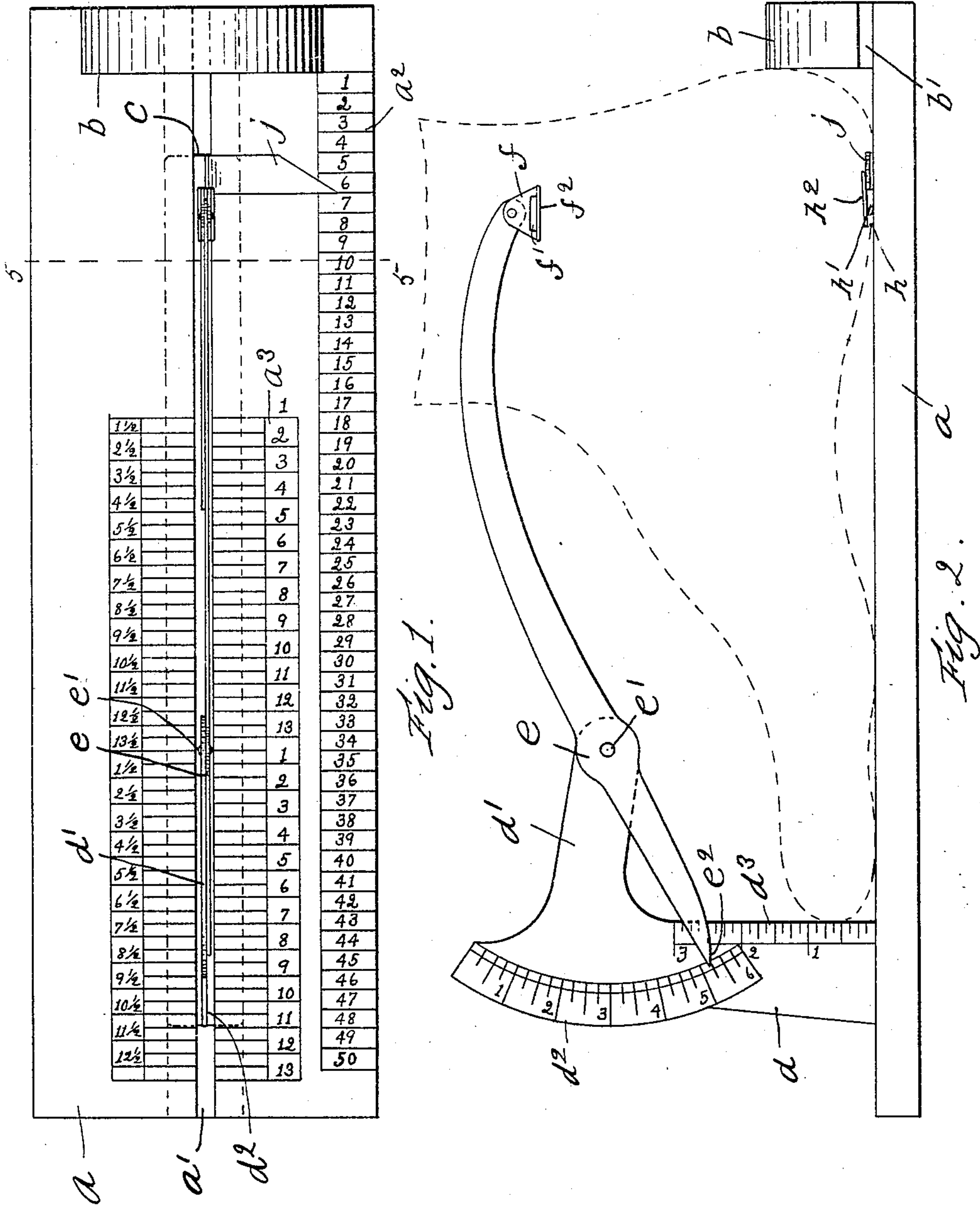


H. F. GOODRICH.
 FOOT OR LAST MEASURE.
 APPLICATION FILED APR. 1, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:
 H. B. Davis.
 Maud M. Piper

Inventor:
 Howard F. Goodrich
 By Hoyt & Hamman
 Attys.

No. 774,580.

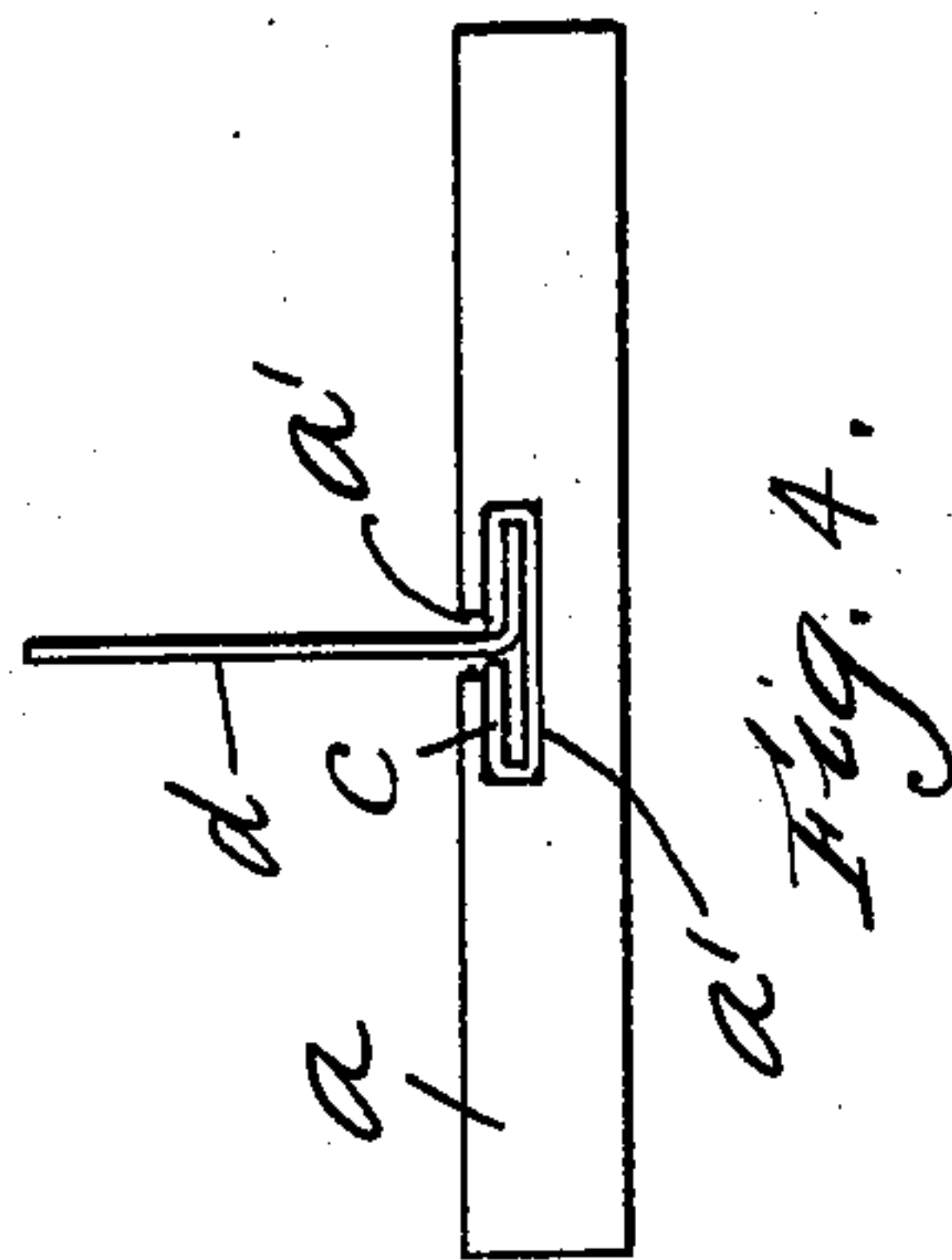
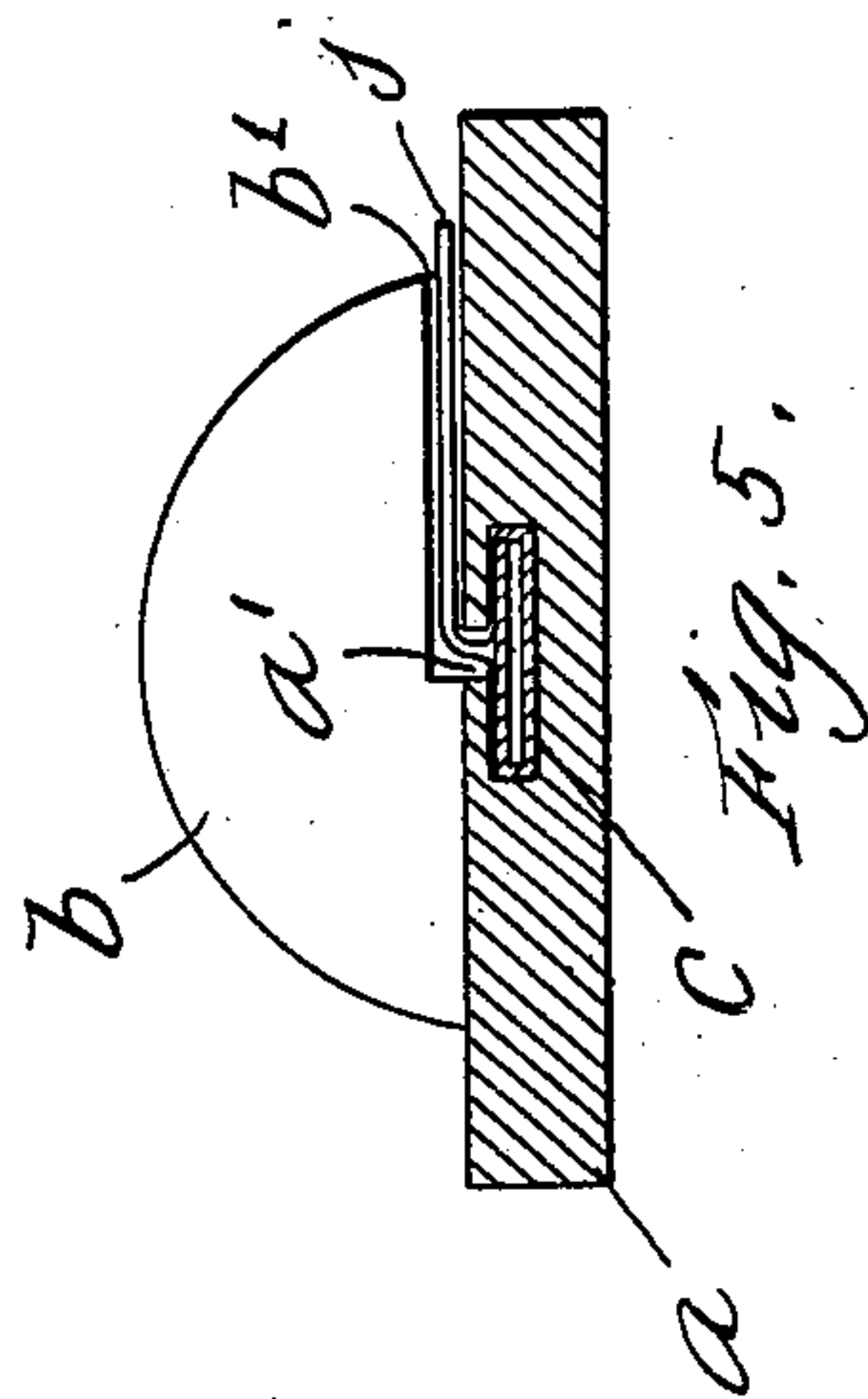
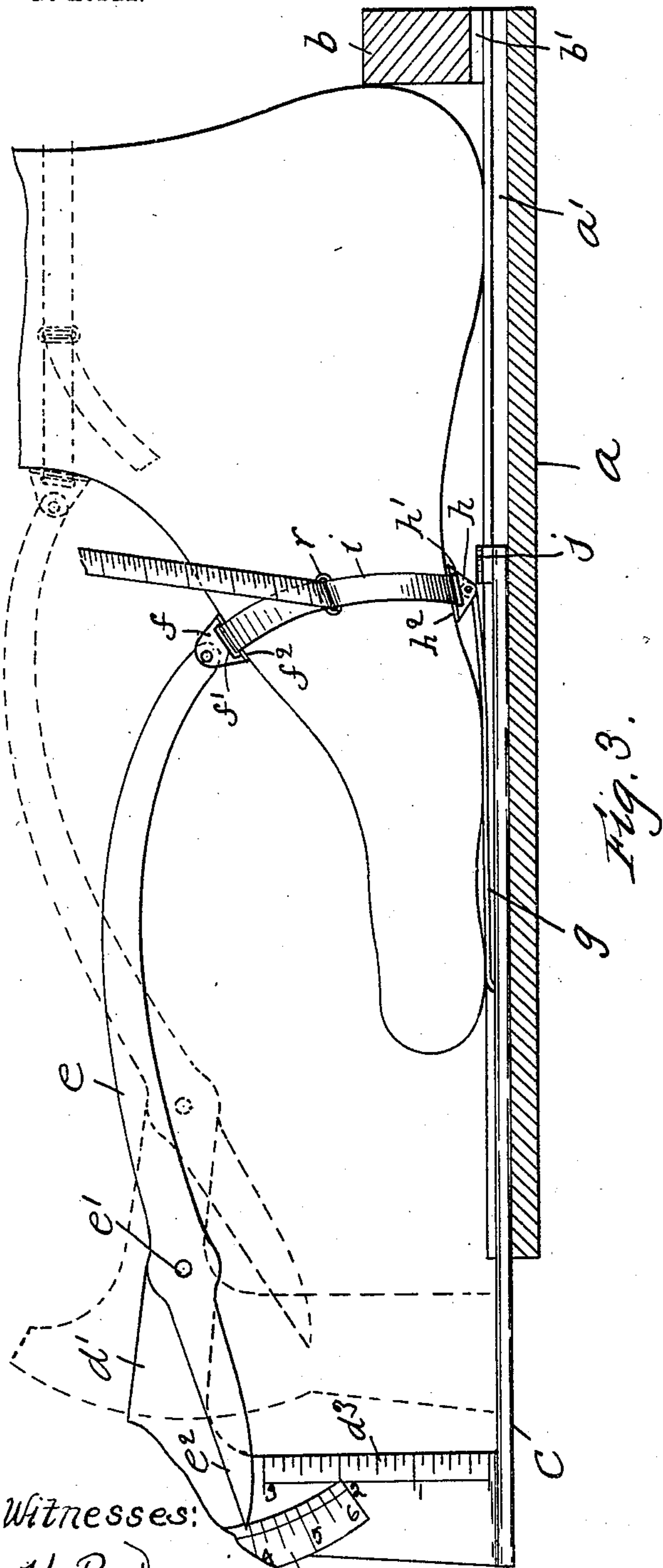
PATENTED NOV. 8, 1904.

H. F. GOODRICH.
FOOT OR LAST MEASURE.

APPLICATION FILED APR. 1, 1904.

NO MODEL.

2 SHEETS—SHEET 2.



Witnesses:

H. B. Davis.

Maund M. Piper.

Inventor:
Howard F. Goodrich
by Roy H. Hamman
Attys

UNITED STATES PATENT OFFICE.

HOWARD F. GOODRICH, OF HAVERHILL, MASSACHUSETTS.

FOOT OR LAST MEASURE.

SPECIFICATION forming part of Letters Patent No. 774,580, dated November 8, 1904.

Application filed April 1, 1904. Serial No. 201,034. (No model.)

To all whom it may concern:

Be it known that I, HOWARD F. GOODRICH, of Haverhill, State of Massachusetts, have invented an Improvement in Foot or Last Measures, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to means for taking the measurements of the human foot preliminary to the making of lasts and patterns and the production of shoes of a desired size and shape.

While it is a simple matter to take the measurements of a foot or last it has always been quite another matter to locate these measurements on the lasts and patterns, so that the desired fullness or scantiness will be properly located.

The object of my invention is to produce a simplified form of measuring device of the above-described character, which will register the exact positions in which each measurement is made on the foot or last, so that the pattern and last makers will be thereby enabled to apply these measurements to the last or pattern to be constructed in positions exactly corresponding to the positions in which the original measurements were made.

A further object of my invention is to provide means whereby the front profile of the foot or last may be accurately plotted or reproduced. I accomplish this object by the means illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of my measuring device. Fig. 2 is a side elevation showing the parts in one position of use. Fig. 3 is a central longitudinal cross-section thereof, showing the parts in other positions of use. Fig. 4 is an end view, and Fig. 5 is a cross-sectional view on the line 5 5 of Fig. 1.

The usual flat base *a* is provided with a vertical heel post or rest *b*, secured at one end thereof and adapted to engage the back of the heel, as in all devices of this character. A T-shaped groove *a'* is formed in the upper side of the base *a* and extends from one end to the other in the middle thereof, and a bar *c* is slidably mounted in said groove. A scale-

plate *d* is secured to the opposite end of said bar *c* from the heel-rest, said plate being held perpendicularly to the surface of the base *a* and extending through the narrow middle portion of the groove *a'*. A pointer-arm *j* is secured to the opposite end of the bar *c* from the scale-plate *d*, said arm extending through the groove *a'* and lying parallel with and close to the surface of the base in position to register with a scale *a''* on the base, which is divided into equal spaces, preferably from one-eighth to one-fourth of an inch in length, numbered in regular order, and extends from the face of the heel-post the entire length of the base-piece. The middle portion of the base is graduated, as is common in devices of this character, with a standard size scale *a'''*, with which the length of the foot or last may be measured. A slot *b'* in the heel-rest permits the pointer *j* to be moved past the rest in measuring small sizes.

A flexible sheet-metal arm *e* is pivoted at *e'* to an arm *d'*, formed integral with plate *d*, both of said arms extending longitudinally of the bar *c* and the pivoted arm *e* being held between the plate *d* and the heel-rest. Said arm *e* has a pointer *e''* at one end, which is adapted to be moved into register with the graduations of an arc-shaped scale *d''* on the scale-plate *d*, said scale having the pivot *e'* as its center. A tape-clip *f* is pivoted to the end of the arm *e* next the heel-rest, said clip having a tape-aperture *f'* and a foot-engaging face *f''*. The length of the clip-bearing portion of arm *e* is such that the pivot of said clip is in close proximity to a vertical plane extending longitudinally of the pointer *j* through its longer edge, while the pointer *e''* is in register with a part of scale *d''*.

A spring-wire *g* is connected at one end to the measuring-bar *c* and extends longitudinally thereof in the slot *a'* toward the heel-rest, and a tape-clip *h* is pivoted to its opposite end, said clip having a flat foot-engaging surface *h''* and a tape-aperture *h'* and being so arranged that its pivot is approximately in the vertical plane of the longer edge of pointer *j*.

The manner of using my device is as follows: The person taking the measurements is provided with a card which is conveniently

ruled for the special purpose. The foot or last is then placed on the base-piece with the back of the heel against the heel-rest b , and the bar c is moved toward the heel-rest until
 5 the adjacent edge of the scale-plate d engages the end of the toe, said edge thus registering the size on scale a^3 . The flexibility of the arm e enables it to be bent to one side while making the length measurement. A tape i is
 10 then passed through the clip f of the arm e and the clip h of the spring-wire g , and the foot is measured while the tape is thus held in as many positions as desired between the instep and the end of the foot, the tape being
 15 drawn closely about the foot, so that the face f^2 of clip f will be pressed against the middle of the front of the foot and the face h^2 of clip h against the middle of the bottom thereof, the arm e swinging on its pivot and the wire
 20 g bending, if necessary, to permit such movement, as shown in Fig. 3. In order that the tape may be moved to take a measurement, the bar c must be moved therewith, so that the pointer j will register on the scale a^2 the
 25 spaces which the tape is from the heel-rest or its horizontal position with relation thereto, and the pointer e^2 will register on the scale d^2 the distance in inches from the face of clip f to the surface of base a' —that is, the height
 30 of the foot at the point at which the measurement is taken. The tape measurements and the corresponding readings on the scales a^2 and d^2 are all tabulated together. Preferably the tape i is secured to the clip h at a predeter-
 35 mined point, so that the measurement from the clip h to the usual ring r in one end of the tape is an even number of inches, the even graduations on the tape beginning at the clip h and extending toward the opposite end there-
 40 of as far as necessary. In case there should be any special deformity in the foot the measurement may be taken separately from the middle of the bottom of the foot to the mid-
 45 dle of the front of the foot at each side thereof—that is, the measurements may be taken separately about each side of the foot from the clip h , which is always held in the groove
 50 a' at the middle of the bottom of the foot to the clip f , which is held against the middle of the front of the foot. These particular measure-
 55 ments will then be recorded with the position measurements, as before described. In case a person wishes a shoe of a certain height the arm e is swung so that its pointer e^2 reg-
 60 isters this height on the scale d^2 , and then the measurement about the ankle or leg is made, as illustrated in dotted lines in Fig. 3, and then the succeeding measurements down to the instep may be made in like manner,
 65 the heights at which these measurements are made being registered on the scale d^2 and recorded with the tape measurements. In drafting a pattern from the measurements thus secured the pattern-maker will be provided with a scale corresponding exactly to the scale

a^2 , and also preferably with a swinging arm and scale slidably mounted on the board corresponding exactly to the arm e and scale d^2 . The measurements recorded from the scales
 70 a^2 and d^2 represent horizontal and vertical measurements from the vertical projection of the line of intersection of the surface of the base and face of the heel-rest, so that the pattern-maker is thereby enabled to plot a
 75 curve which will correspond exactly to the front contour or profile of the foot in its exact relation to the back of the heel and the bottom of the foot. This contour-line deter-
 80 mines the front edges of the quarter-patterns and the middle line of the vamp-patterns. The widths of the quarters, vamps, &c., are then ascertained by taking the tape measure-
 85 ments at the points on said contour-line corresponding to the points on the foot at which such measurements were made to the oppo-
 90 site edges of the pattern, the desired fullness at the various points thus being accurately provided for.

A scale d^3 on the scale-plate d is employed to measure the inclination of the bottom of a
 95 last.

I do not desire to limit my invention to a pivoted arm, as e ; but such construction involves much less complication and is much more
 100 convenient than if the whole arm were made to slide vertically, and while such latter arrangement would enable the tape-clip thereon to be held exactly over the bottom clip at all times, yet such exactness is unnecessary, and,
 105 moreover, when substantially the same apparatus is employed in drafting the pattern as was used for taking the measurements these slight inaccuracies will correct themselves.

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

1. A foot-measure comprising a base having a heel-rest at one end thereof, a bar slidable longitudinally of said base, a measuring-tape and means connected to said bar for holding
 115 the tape at points above and below the foot adjacent the middle thereof, said base having a longitudinal scale for registering the position of the tape, substantially as described.

2. A foot-measure comprising a base having
 120 a heel-rest at one end thereof, a bar slidable longitudinally of said base and having a measuring-tape carried thereby, an arm connected to said bar having its end vertically movable directly above the point at which said tape is
 125 connected to said bar, and means for registering the vertical position of the end of said arm and the horizontal position of said bar, substantially as described.

3. A foot-measure comprising a base, a heel-
 130 rest thereon, a bar slidable longitudinally of said base, an arm connected to said bar having its end vertically movable over said bar, tape-holding means carried by the end of said arm and by said bar, the one directly over the

other, and means for registering the horizontal and vertical positions of said tape-holding means, substantially as described.

4. A foot-measure comprising the base having a heel-rest at one end, a measuring-tape and means for holding the tape at points above and below the middle of the foot with one directly over the other, and means connected to said tape-holding means for registering the horizontal and vertical positions of the tape at the points at which it is held, substantially as described.

5. A foot-measure comprising a base, a heel-rest thereon, a bar slidable longitudinally of said base having a tape-clip connected thereto, an arm carried by said bar, a tape-clip carried by said arm and means permitting vertical movement of said arm and its clip directly above the clip on said bar, and means for registering the horizontal and vertical positions of said clips, substantially as described.

6. A foot-measure comprising a base, a heel-rest, a vertical scale-plate mounted on said base and slidable longitudinally thereof, an arm pivoted on said plate to swing above the middle of said base in a vertical plane, a pointer connected to said arm and registering on the scale of said plate the vertical distance from the end of said arm to said base, and means for registering the horizontal position of said arm with relation to said heel-rest, substantially as described.

7. A foot-measure comprising the base having a heel-rest, a bar slidable longitudinally in the middle thereof, a pointer on said bar registering with a longitudinal scale with which said base is provided, a tape-holding clip on said bar in fixed relation with said pointer, an arm carried by said bar and having its end vertically movable directly over said clip, and

means for registering the vertical position of said arm, substantially as described.

8. A foot-measure comprising a base having a heel-rest and a longitudinally-extending groove, a bar slidably mounted in said groove and having a spring-arm connected thereto at one end in said groove, a tape-clip carried by said arm at its opposite end, and movable against the bottom of the foot, a vertically-movable arm mounted on said bar and having a tape-clip pivoted at its end, arranged to engage the front of the foot, and means for registering the horizontal and vertical positions of said clips, substantially as described.

9. A foot-measure comprising the base having a heel-rest at one end, a measuring-tape and means for holding the tape at points above and in the central vertical plane of the foot, and means connected to said tape-holding means for registering the horizontal and vertical positions of the tape at the points at which it is held, substantially as described.

10. A foot-measure comprising a base, a heel-rest at one end thereof, a longitudinally-movable bar or support on said base, an arm mounted on said support and arranged to extend over the front, middle portion of the foot, means permitting vertical movement of the end of said arm, and means, comprising independent scales, for simultaneously registering the vertical and horizontal position of the end of said arm with relation to said heel-rest, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HOWARD F. GOODRICH.

Witnesses:

LOUIS H. HARRIMAN,
H. B. DAVIS.