

(Model.)

T. B. SALTER & J. HUGHES.

SPRING SCALE.

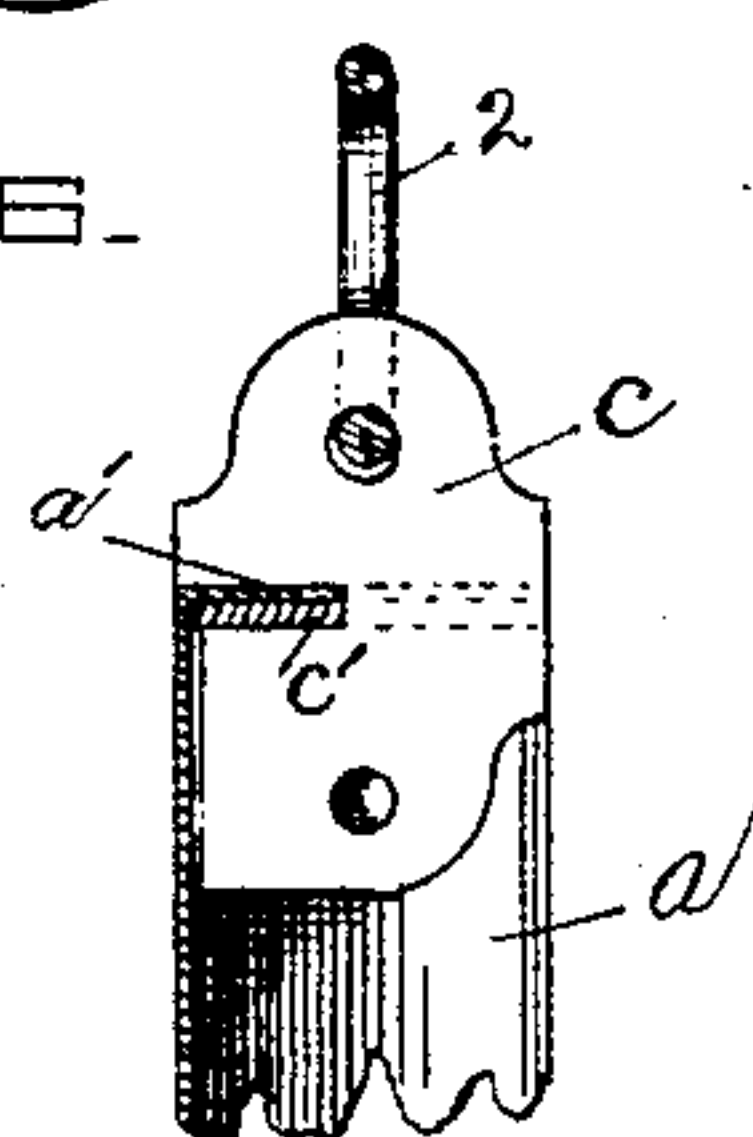
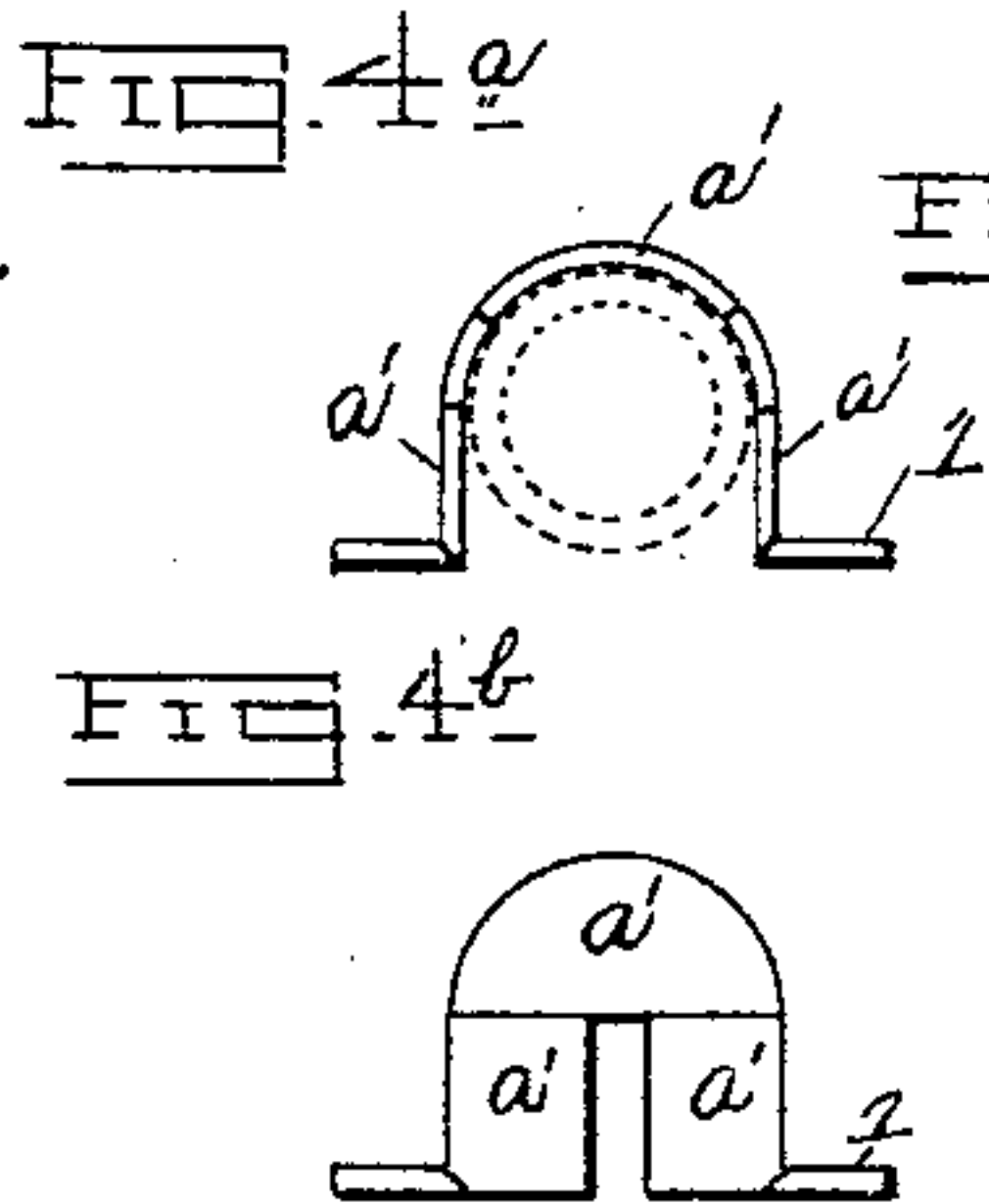
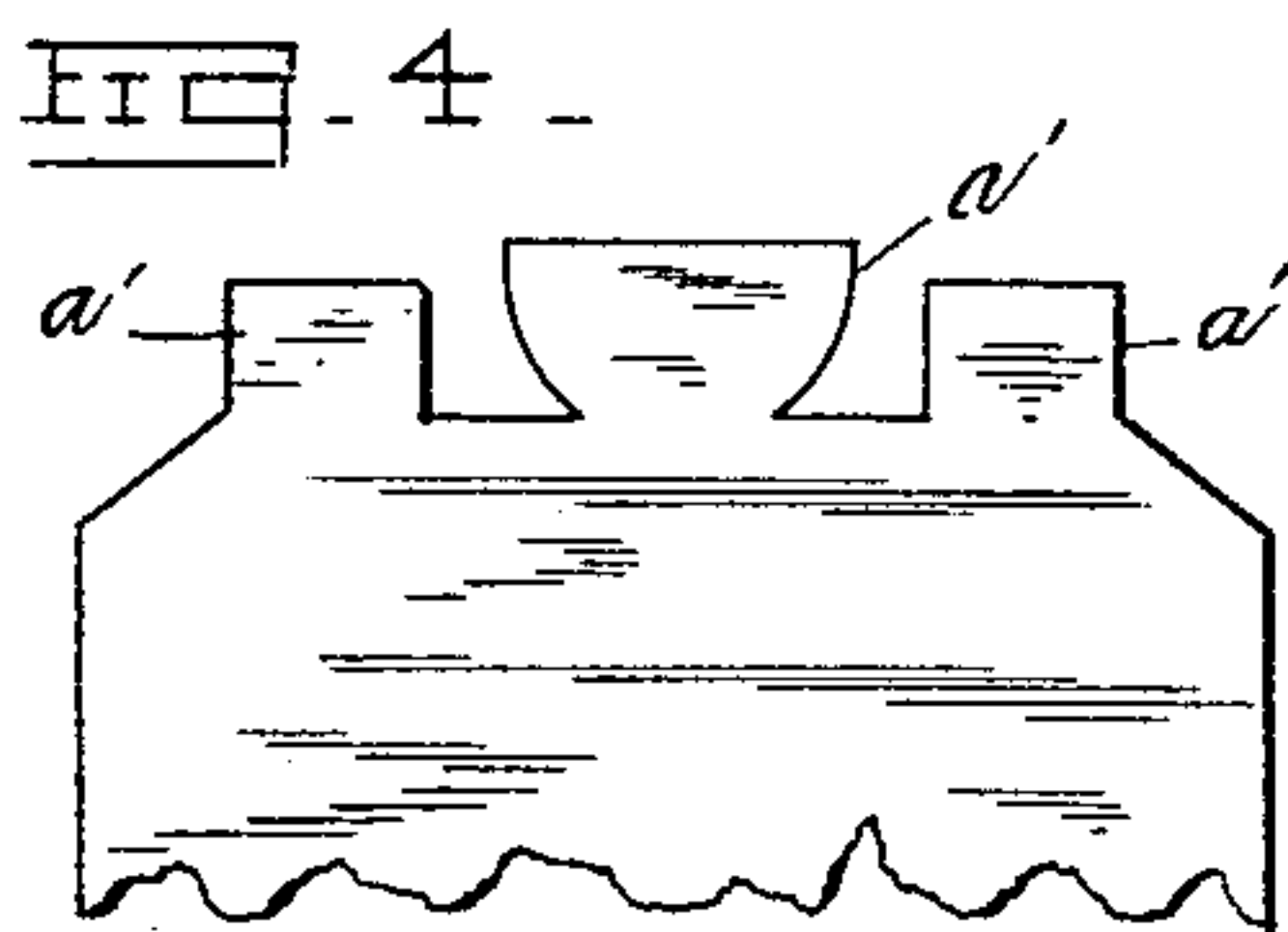
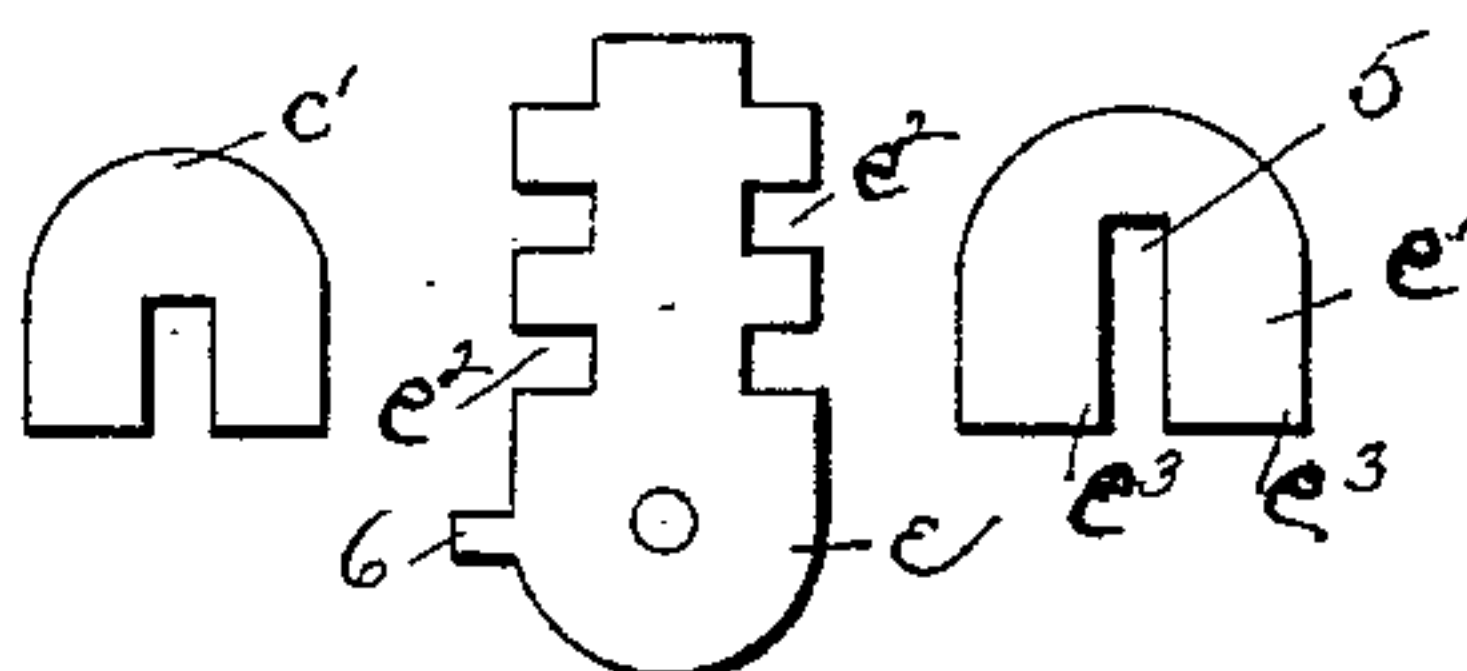
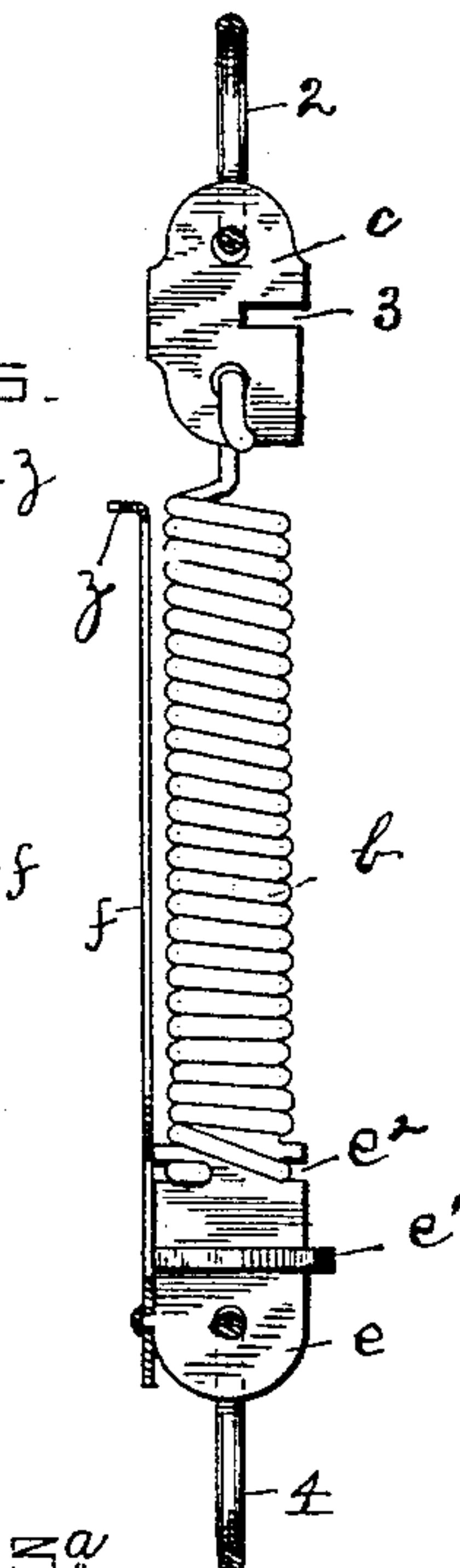
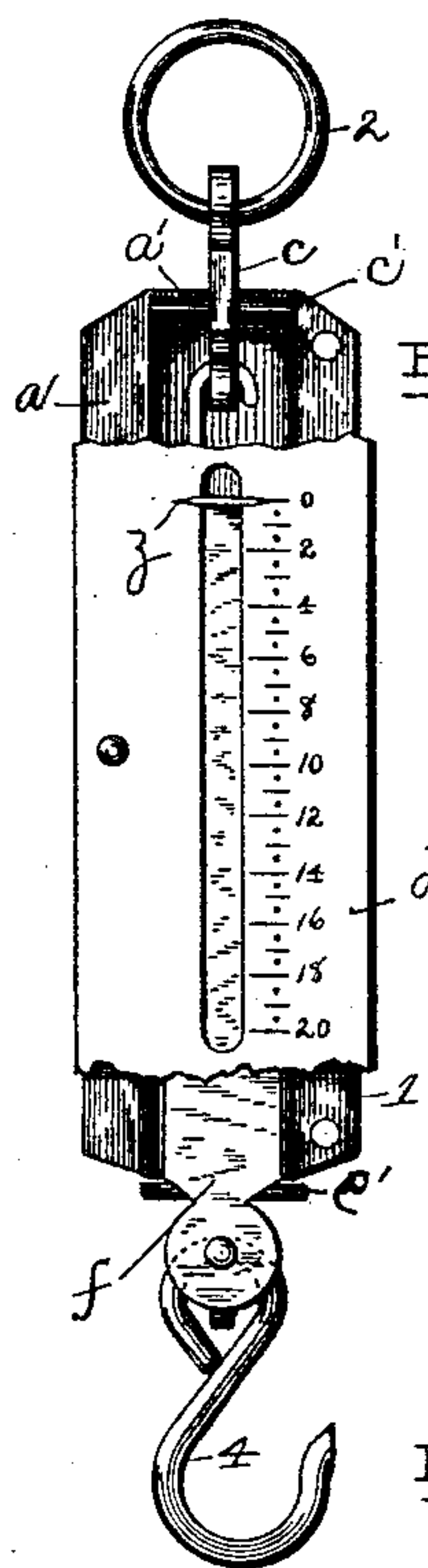
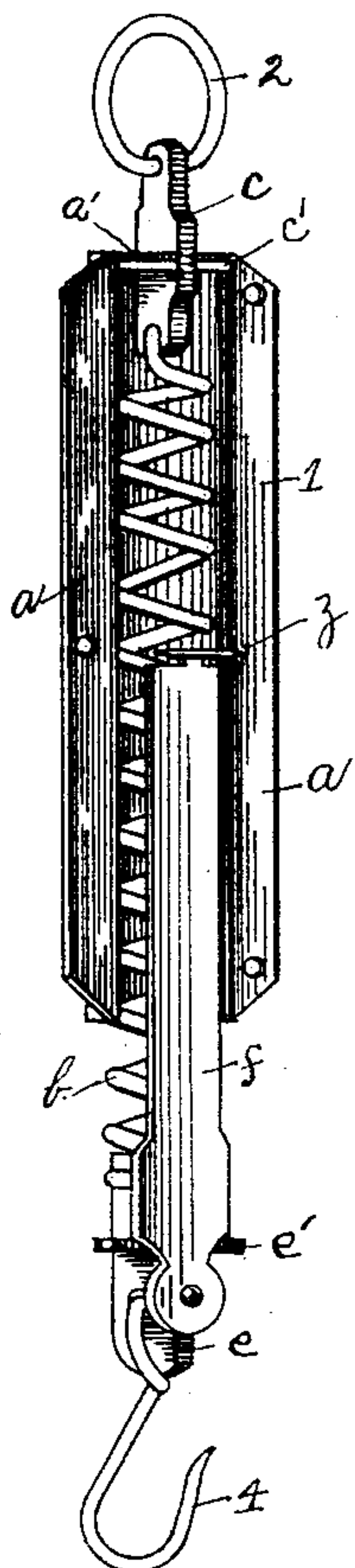
Nº. 390,522.

Patented Oct. 2, 1888.

Fig. 1.

Fig. 2.

Fig. 3.



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C. J. Homer.  
C. B. Jones.

Inventor 5.

Thomas Backe Salter,  
and John Hughes!  
By Chas. J. Gooch  
Atty.

# UNITED STATES PATENT OFFICE.

THOMAS BACHE SALTER AND JOHN HUGHES, OF WEST BROMWICH,  
COUNTY OF STAFFORD, ENGLAND.

## SPRING-SCALE.

SPECIFICATION forming part of Letters Patent No. 390,522, dated October 2, 1888.

Application filed March 22, 1884. Serial No. 125,166. (Model.) Patented in England January 5, 1884, No. 800; in Austria-Hungary January 12, 1884, No. 2,591 and No. 38,989; in France January 15, 1884, No. 159,737, and in Canada April 22, 1884, No. 20,397.

*To all whom it may concern:*

Be it known that we, THOMAS BACHE SALTER and JOHN HUGHES, both of the town of West Bromwich, in the county of Stafford, England, have invented certain new and useful Improvements in the Manufacture of Spring-Balances, (for which patents have been granted us in the following countries, viz: in England, dated January 5, 1884, No. 800; in France, January 15, 1884, No. 159,737; in Austria-Hungary, January 12, 1884, Nos. 2,591 and 38,989, and in Canada, April 22, 1884, No. 20,397,) of which the following is a specification.

This invention relates to improvements, as hereinafter described and claimed, in spring-balances.

In the accompanying drawings, Figure 1 is a perspective view of the spring-balance with the dial-plate removed in order to better illustrate the position and construction of the parts. Fig. 2 is a front elevation of the balance with parts of the dial-plate removed. Fig. 3 is a side elevation representing the spring and its connection with the loops and tongue. Fig. 3<sup>a</sup> represents the details of the parts of the upper and lower loops. Fig. 4 represents the blank for forming the case; Fig. 4<sup>a</sup>, an edge or top view of the same after the first operation of forming the case; Fig. 4<sup>b</sup>, a top view with the parts *a'* of the blank bent down into position. Fig. 5 represents a front elevation of the tongue and pointer made from one piece of metal. Fig. 6 represents a vertical section of part of the case, showing the manner of fastening the case to the suspending-loop.

*a* represents the case, which is formed out of a single piece of sheet metal, which is first stamped out, as shown in Fig. 4, in flat form, with central and side lips, *a'*, at its upper end. This blank is then by any suitable means bent into semicircular form, as shown in Figs. 4<sup>a</sup> and 4<sup>b</sup>, with the central lip, *a'*, turned horizontally inward to cover the rear top end of the case, and with the side wings, *a'*, turned inward in a horizontal direction and transversely vertical side wings or flanges, 1, being formed by turning the sides of the blank out-

ward, and to which the dial-plate is attached. Within this semicircular case so formed the spiral weighing-spring *b* is contained, as shown in Fig. 1.

*c* represents the balance-suspending loop, which has an eyed lower end, within which the upper end of the spiral spring *b* is engaged, and an eyed upper end, within which the suspension-ring 2 is contained, a slot being formed about midway in the rear edge of the loop *c* to permit said loop's extending across and resting upon the upper face of the central bent-down wing, *a'*.

*c'* represents a cross-piece or key, which is placed against the under faces of the wings *a'*, constituting the top of the case. When such cross-piece has thus been placed in position, the loop *c* is placed in position by forcing its slotted portion upon and in gripping contact with the upper face of the central wing, *a'*, and the under face of the cross-piece *c'*. As will be observed on reference to Fig. 3<sup>a</sup>, the cross-piece *c'* has a central slotted portion, which permits the passage of the loop *c*, and a rearward plane portion, against which the bottom edge of the slotted portion of the loop *c* may grip.

4 represents a hook or other suitable device, to which the article to be weighed is attached or from which it is suspended.

*e* represents a bottom loop, to which the hook 4 is attached. This loop has formed in its respective edges notches or recesses *e<sup>2</sup>* *e<sup>2</sup>*, within the upper pair of which the lower end of the coiled spring *b* is inserted. The cross-piece *e'*, or stop for limiting the upward movement of the loop *e* and parts connected therewith, instead of being held in position by brazing, as formerly, is formed with a central slot, 5, and side arms, *e<sup>3</sup>*, and is inserted within the lowermost notches, *e<sup>2</sup>*, the slot 5 being of such length and width as to permit the plane portion of this cross-piece rearwardly of the slot to rest within the adjacent notch *e<sup>2</sup>*, and of the side arms, *e<sup>3</sup>*, gripping the side faces of the lower loop, *e*.

6 represents a stud projecting from the front edge of the loop *e*, to receive and constitute a



pivot for the lever end of the tongue *f*. This tongue is riveted in position upon the stud 6 in the usual manner. The tongue *f* and pointer *z* are formed integrally in a single piece of metal by stamping the upper end of the tongue in reduced form, somewhat after the shape of a T, and then bending such T portion over forwardly into horizontal position.

*d* represents the dial-plate, which is removably held in position upon the case by screws, or otherwise passed through suitable holes in its face adjacent to its edges and corresponding holes formed in the side wings or flanges, 1, of the case.

It will be observed that in our dial-plate the graduation-marks are adjacent to the slot therein, and the numerals and other indications are at the outer ends of such graduation-marks.

The case having been constructed and the case-suspending loop and ring secured thereto, as herein described, the lower loop, *e*, spring *b*, stop or cross piece *e'*, and tongue *f* are then connected together, as explained. The pointer *z* is then inserted sidewise within the slot in the dial-plate by being pushed through from the rear of the dial-plate, and the pointer, spring, and parts connected therewith then brought to a vertical position. The spring is then inserted within the case and attached at its upper end to the loop *c*, and the dial-plate attached to the side flanges, 1, of the case, which operation completes the assembling of the parts and results in the production of a complete balance.

It will be observed that the several parts of the balance are securely connected together without the aid of brazing, solder, or other similar means; that all of the several parts going to constitute the complete balance can be readily, easily, and cheaply formed, assembled, and connected together, and that the

balance is composed of the minimum number of parts necessary to secure an exact operative device.

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What we claim is—

1. A spring-balance comprising a case formed of a single piece of metal with outwardly-extending side flanges and at its upper end with intumed lips, a hanger-strip adapted to rest between said lips, and having eyed ends extending, respectively, above the top of and within the case, a key or securing-strip for clamping said hanger-strip and case together, a suspending-ring engaging the eyed upper end of said hanger, a weighing-spring engaging at its upper end with the eyed lower end of said hanger, a notched plate, to which the lower end of said spring is connected and having an eyed bottom end to receive a support for the article to be weighed, an integrally-formed tongue and pointer secured at its lower end to said notched plate, and a vertically-slotted graduated face-plate adapted, as described, to be secured to the side flanges of the case, substantially as and for the purpose set forth.

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2. In a spring-balance, the combination, with an encircling case and a spiral spring, of a slotted loop adapted to receive the lower end of said spring, a slotted cross-bar adapted to grip the slotted loop and serve as a stop for limiting the upward movement of the spring, and a hook or suspension device attached to the loop at the lower end of the spring, and a loop connected to the upper end of said spring, and having an attaching cross-bar and a suspending loop or ring, substantially as set forth.

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THOMAS BACHE SALTER.  
JOHN HUGHES.

Witnesses:

GEORGE THOMAS CASHMORE,  
THOMAS SMITH.