

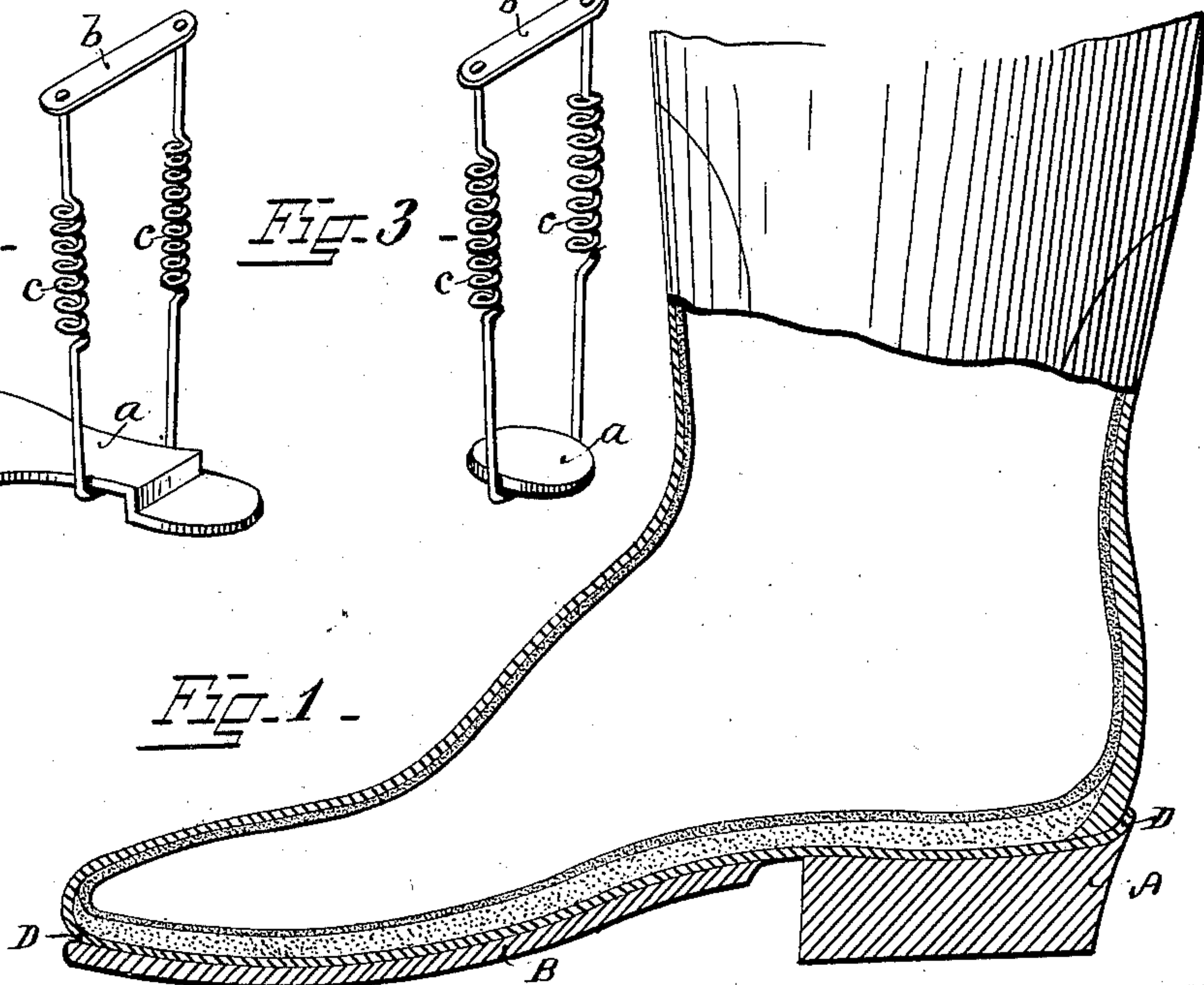
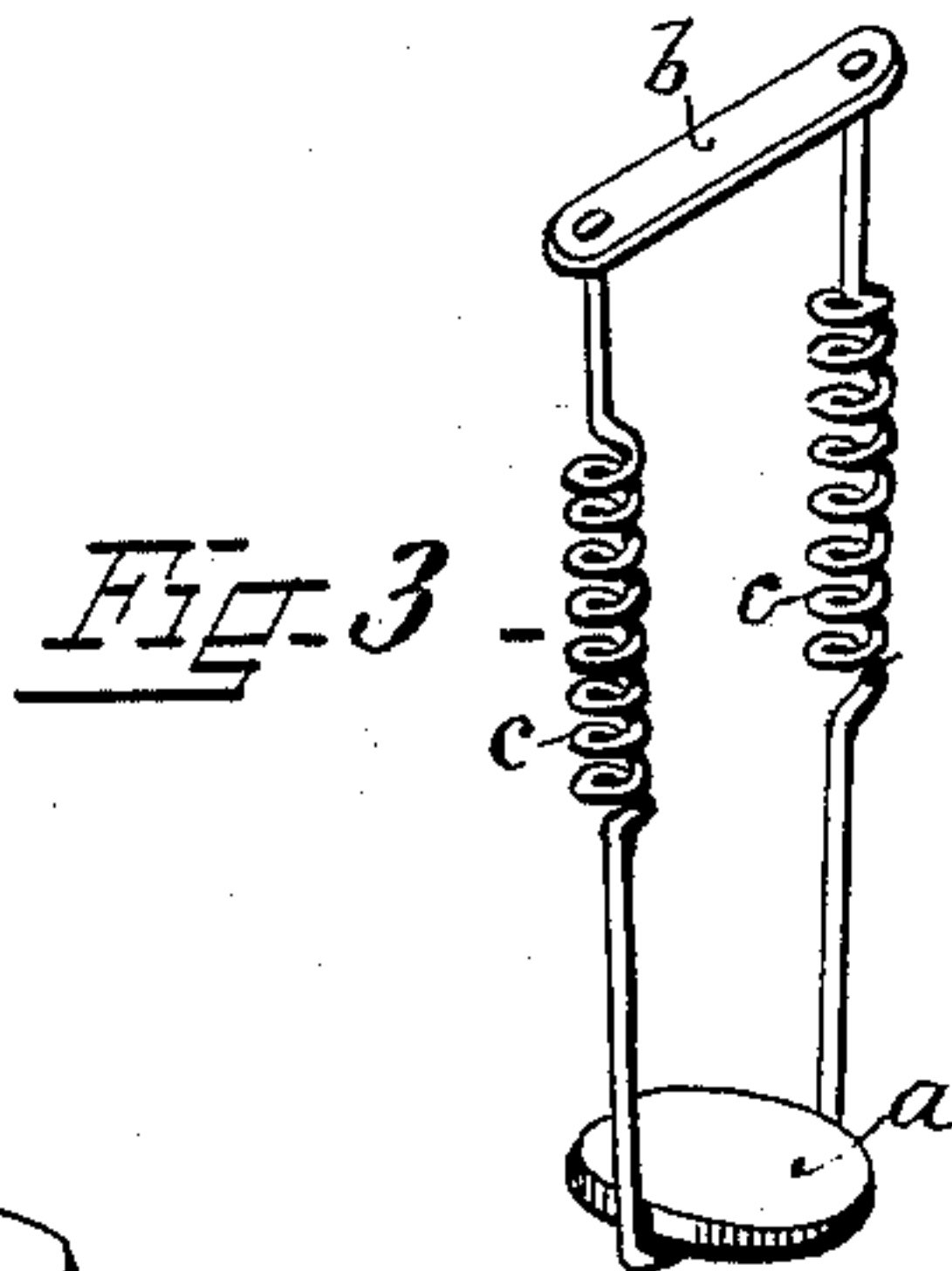
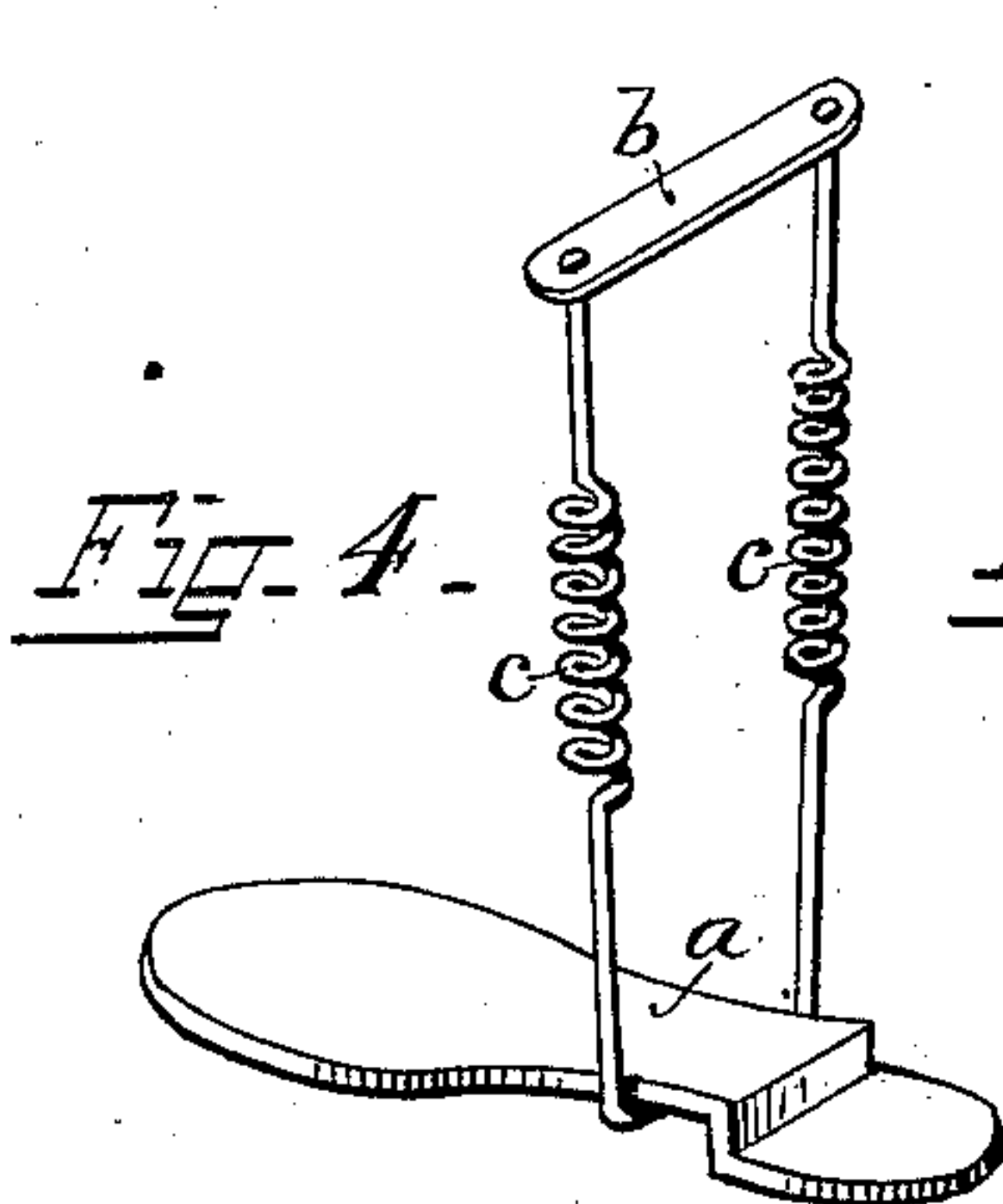
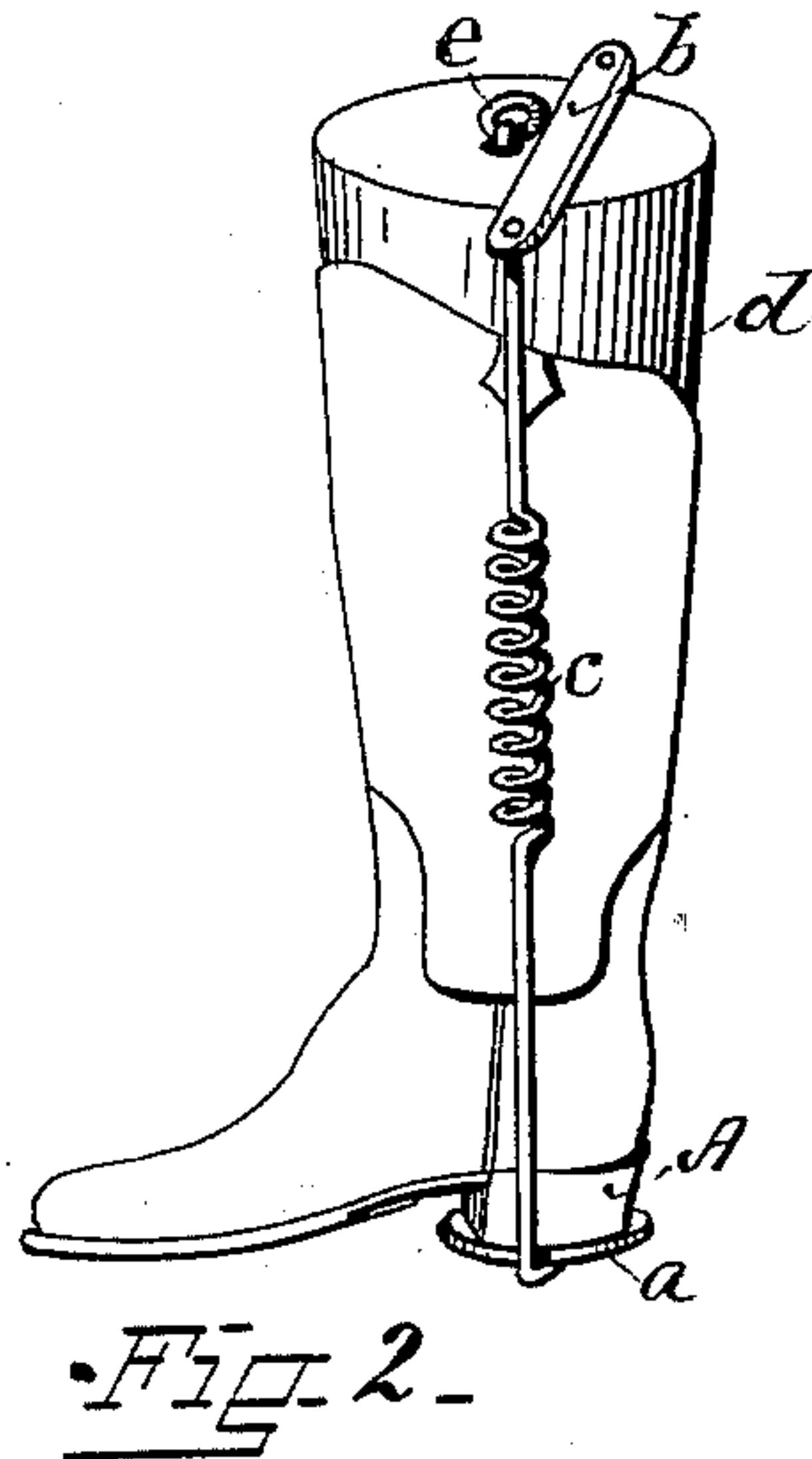
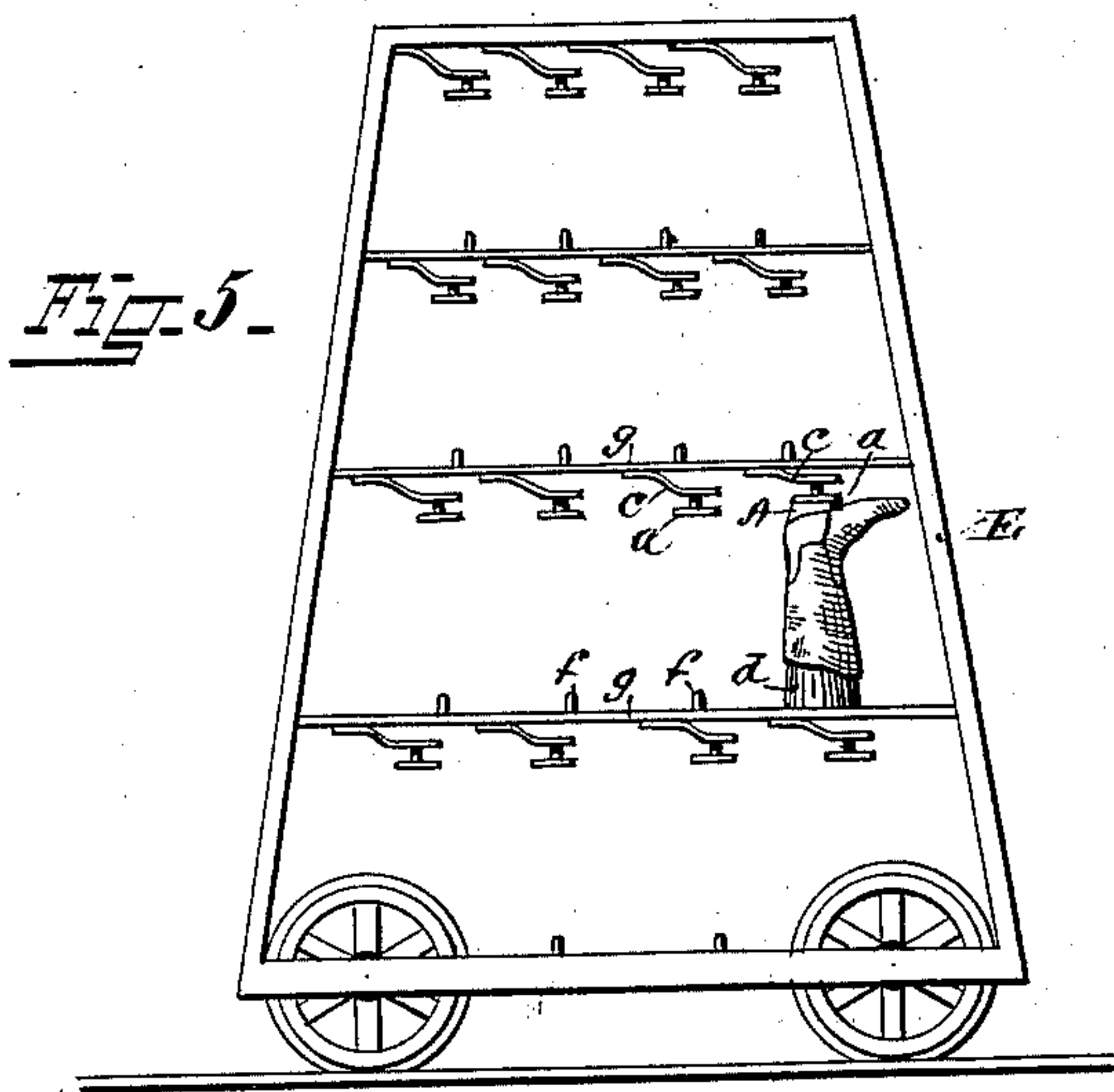
(No Model.)

J. C. BICKFORD.

MANUFACTURE OF INDIA RUBBER BOOTS AND SHOES.

No. 308,736.

Patented Dec. 2, 1884.



WITNESSES:

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JOHN C. BICKFORD, OF BRISTOL, RHODE ISLAND.

MANUFACTURE OF INDIA-RUBBER BOOTS AND SHOES.

SPECIFICATION forming part of Letters Patent No. 308,736, dated December 2, 1884.

Application filed May 6, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. BICKFORD, of Bristol, in the county of Bristol and State of Rhode Island, have invented an Improvement in the Manufacture of India-Rubber Boots and Shoes, of which the following is a specification.

Heretofore in the manufacture of rubber boots and shoes the heels and the thick soles have been first cemented to the bottom of the boot or shoe and then placed in the oven for open vulcanization without molding or compression, and as a result of this process the attachment of the heel or sole to the adjoining parts of the boot or shoe has been imperfectly effected, and in ordinary wear the heels and soles are liable to become loosened and to separate from the bottom of the boot or shoe; and the object of my improvement is to secure the heel and sole to the bottom of the boot or shoe in a permanent manner; and to this end I attach the heel or sole to the adjoining parts by cement, and then vulcanize the same under a proper local pressure, by which means a perfect junction of the parts will be formed, so that they will not thereafter become loosened in ordinary wear, as heretofore.

Figure 1 represents a section of the heel and sole of a rubber boot. Fig. 2 represents an elevation of the boot placed upon the boot-tree preparatory to vulcanization, and showing a spring device adapted to secure proper local pressure upon the heel during the process of vulcanization. Figs. 3 and 4 are perspective views of the spring device employed to secure local pressure upon the heel and the heel and sole. Fig. 5 represents a side elevation of the car employed in the vulcanizing-oven, and shows an arrangement of springs adapted to secure the required pressure upon the heel in process of vulcanization.

In the accompanying drawings, Fig. 1 represents a vertical section of the lower portion of a rubber boot in which the previously-molded heel A and the sole-piece B are cemented to the bottom piece, D, of the boot previous to vulcanization, and in carrying out my improved process for attaching the

heels or soles to rubber boots and shoes I preferably provide a spring device as shown in Fig. 3, consisting of the plate *a*, which is connected to the cross-piece *b* by means of the springs *c c*, and after the heel A has been placed in position upon the boot the plate *a* is to be placed over the bottom of the same, and the cross-bar *b* brought over the projecting end of the boot-tree *d*, as shown in Fig. 2, causing the required extension of the springs *c c* to produce the proper degree of pressure upon the heel, and when so prepared the boots may be suspended in the vulcanizing-oven by means of the ring or eye *e* at the upper end of the boot-tree. Whenever it is desired to secure both the heel and sole in this manner, a spring device, as shown in Fig. 4, may be used, the plate *a* being in this case extended so as to embrace the sole with the heel.

A modification of the device for securing the vulcanization of the boot, with local pressure upon the heel, as arranged in a vulcanizing-car, is shown in Fig. 5, in which the boot-tree *d* is placed bottom up upon the pin *f*, projecting upward from the bar *g*, the heel A being held under pressure by means of the spring *c*, to the outer end of which the pressure-plate *a* is attached. The car E, when thus filled with boots, is to be placed in the vulcanizing-oven, and in the process of vulcanization the boot-heel thus held under pressure will become firmly attached to the other parts of the boot, and will not thereafter be liable to loosening and separation, as heretofore.

I am aware that it is common to inclose articles of rubber in molds for the purpose of vulcanization, in which process the cemented parts will become firmly attached to each other under pressure; but in all such instances the whole extent of the article manufactured has been included in the cavity of the mold, and I am not aware that local pressure has ever been applied in the process of open vulcanization, as in the manufacture of boots and shoes.

I claim as my invention—

The method of attaching the heel, or heel

and sole, to rubber boots or shoes, which consists in first cementing the heel, or heel and sole, to the adjoining parts, which are held upon a boot tree or last, with the subsequent application of direct exterior pressure upon the heel, or heel and sole, while the upper portion of the boot or shoe is openly

distended by the boot tree or last when undergoing the process of vulcanization, substantially as described.

JOHN C. BICKFORD.

Witnesses:

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