

*A. Bickel,*

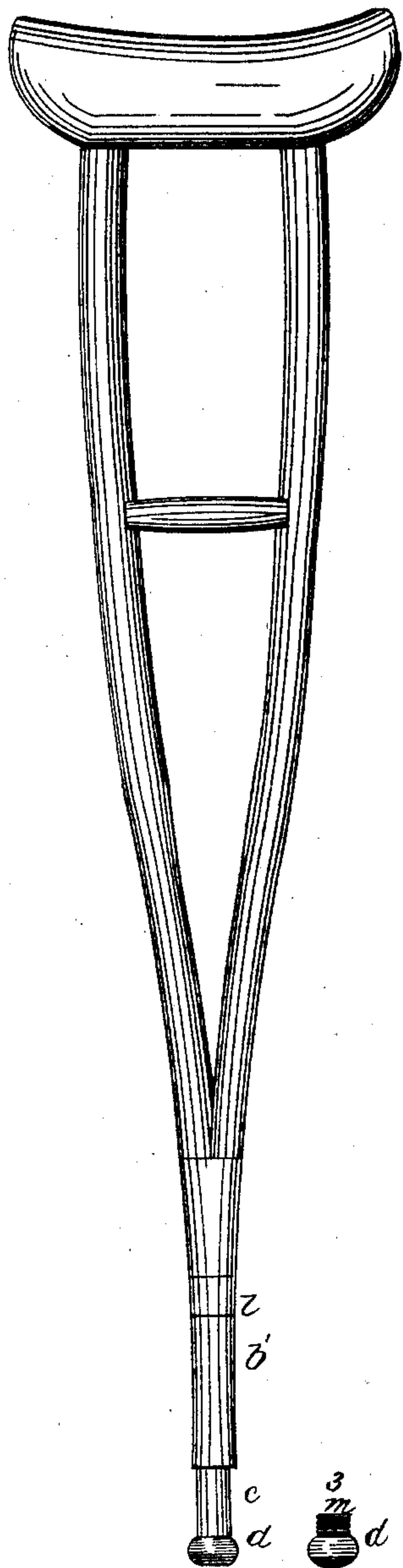
*Crutch,*

*Nº 26,829,*

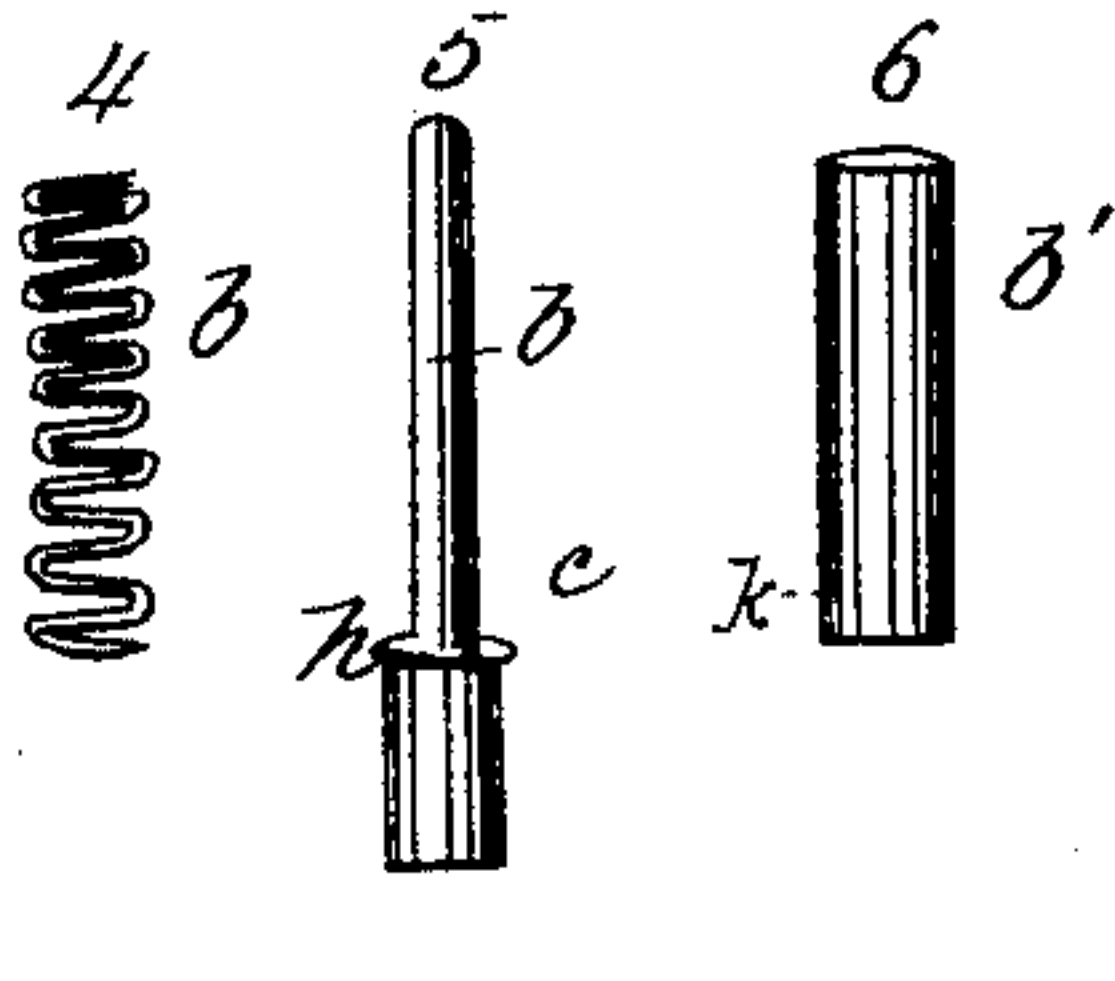
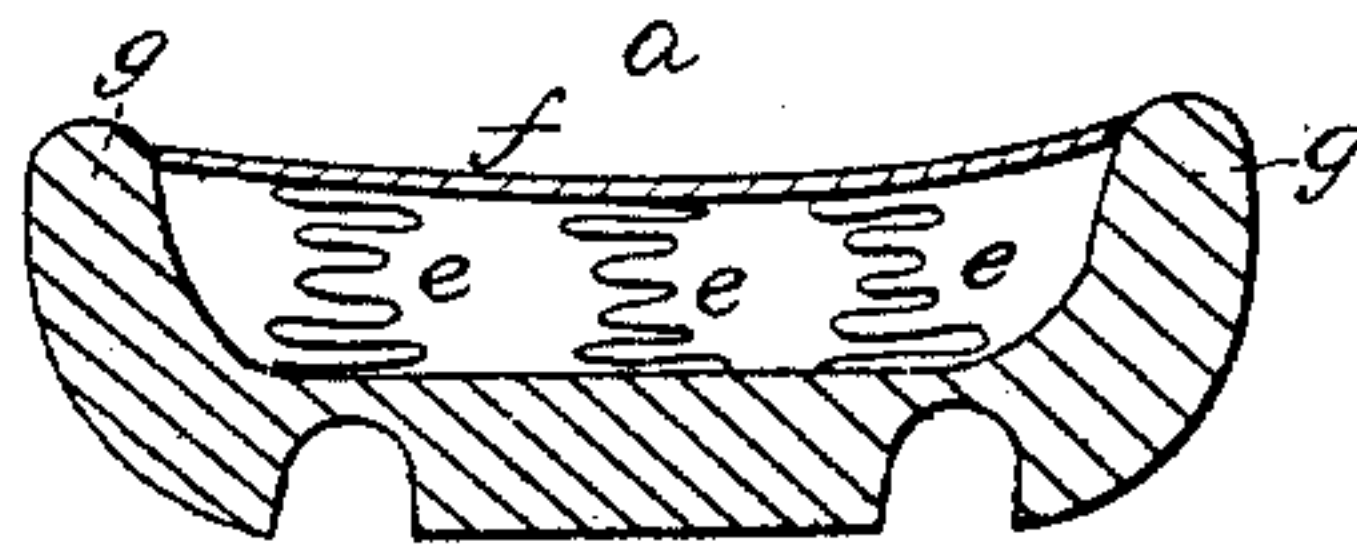
*Patented Jan. 17, 1860*

*Fig 1*

*a*



*Fig 2.*



*Witnesses.*

*Benj. M. M. M.  
Philip Young*

*Inventor.*

*August Bickel*

# UNITED STATES PATENT OFFICE.

AUGUST BICKEL, OF PHILADELPHIA, PENNSYLVANIA.

## CRUTCH.

Specification of Letters Patent No. 26,829, dated January 17, 1860.

*To all whom it may concern:*

Be it known that I, AUGUST BICKEL, of the city of Philadelphia, in the State of Pennsylvania, have invented a new and useful Improvement in Crutches for Invalids; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same; reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1, represents a crutch with the improvement applied; Fig. 2, a vertical longitudinal section of the top piece of the same; and Figs. 3, 4, 5, and 6, side views of the different devices which together constitute the lower part of the said crutch—like letters indicating the same parts when on different figures.

The nature of my invention consists in the combined arrangement of a series of spiral springs and an elastic strap, with the top-piece of a crutch, substantially as hereinafter described, whereby the said top-piece is rendered much more easy, and less injurious to the user than heretofore; and in making the lower end of said crutch elastic, in the direction of its length, by means of a spiral spring.

In the drawings, *a*, represents the top-piece; *e, e, e*, the spiral springs, and *f*, the elastic strap thereof; and *b* the spiral spring of the lower part of the crutch.

The top-piece (*a*) is cut away at the upper side so as to produce, both room for the springs (*e, e, e*), and the two stretchers *g, g*, for holding fast the elastic strap *f*. The springs (*e, e, e*) each consist of wire wound spirally into the form of two conical frusta with their smaller ends joined, and arranged and secured in vertical position between the two stretchers (*g, g*), as shown in Fig. 2. The strap (*f*) consists of a piece of vulcanized rubber (of sufficient thickness, breadth and strength, to form, with the springs (*e, e, e*) an elastic support adapted to the invalid) which is drawn between and tacked, or otherwise fastened, to the tops

of, or over the stretchers—the ends of the springs (*e, e, e*), being secured thereto and to the bottom of the cavity in the top-piece (*a*) by means of wire staples, or otherwise, and the whole covered by leather in the usual manner of covering the top-piece of crutches.

The spiral spring (*b*) is placed in the tube (*b'*) so as to abut both against the lower end of the staff and the shoulder (*h*) of the stem (*c*)—which latter is made to slide in the lower part of the said tube (*b'*) with its lower end projecting therefrom and its mandrel (*i*) passing up through the coils of the said spring (*b*)—the lower end of the staff being bored out so as to allow a free up and down motion of the said stem (*c*) in the tube (*b'*), in using the crutch. This arrangement of a spiral spring in the lower end of the crutch, for the purpose of better obviating the jarring of feet incident to the setting down of the foot of the crutch in using, is more simple and effective than other devices in use for the same purpose, and moreover, admits of a ready changing of the same as either a stiffer or a more yielding spring may, from time to time, be desired by the invalid.

Having thus fully described my improved crutch, what I claim as new therein of my invention, and desire to secure by Letters Patent is,

1. The springs (*e, e, e*), and elastic strap (*f*), in combination with the top-piece (*a*)—the same being constructed, arranged and combined together substantially in the manner and for the purpose set forth and described.

2. I also claim the application of the spiral spring (*b*), to the lower end of the staff, in combination with the tube (*b'*) and stem (*c*), as and for the purposes set forth and described.

AUGUST BICKEL.

Witnesses:

BENJ. MORISON,  
PHILIP YOUNG.