

L. CRANDALL.

Improvement in Crutches.

No. 127,028.

Patented May 21, 1872.

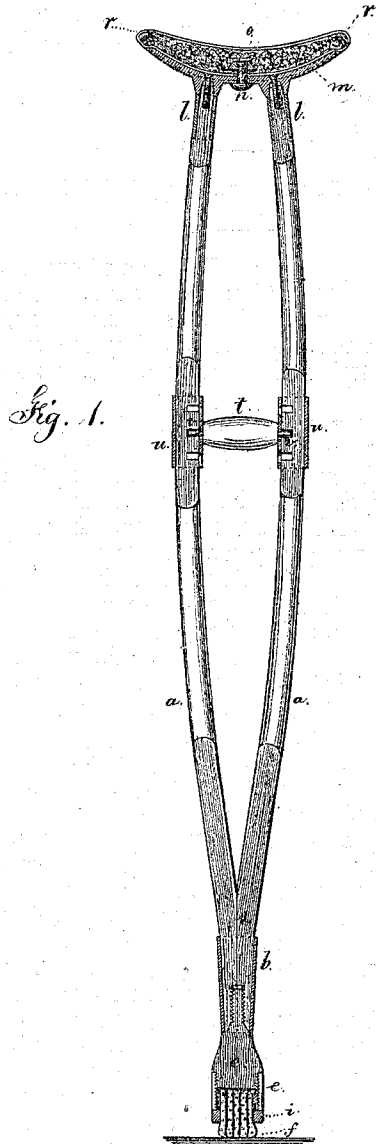


Fig. 5.



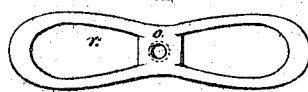
Fig. 4.



Fig. 3.



Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

LUCIUS CRANDALL, OF NEW YORK, N. Y.

IMPROVEMENT IN CRUTCHES.

Specification forming part of Letters Patent No. 127,028, dated May 21, 1872.

To all whom it may concern:

Be it known that I, LUCIUS CRANDALL, of the city and State of New York, have invented an Improvement in Crutches; and the following is declared to be a correct description thereof.

Crutches are exposed to great strain, and cannot be made of heavy material; otherwise they are tiring to the person using the same. Where wood and metal are combined there is difficulty in preventing the parts working loose and the crutch breaking from unequal strain.

My invention is made with reference to obtaining a very light and strong crutch, and one that can be tightened up as the parts wear loose, or taken apart with facility for replacing or repairing any injured parts.

In the drawing, Figure 1 shows my improved crutch with the pad and connections in section. Fig. 2 is a plan, and Fig. 3 a section detached, of the pad-frame in larger size. Fig. 4 is a plan of the rubber tip, and Fig. 5 is an elevation of the tip-holder.

The staves *a* of the crutch are beveled at their lower ends, where they come in contact with each other, as at 1, and these ends pass into the tubular sleeve *b* in a manner somewhat similar to that shown in Letters Patent 40,443; but instead of the wooden end *c* being united to the ends of the staves *a* by a metal screw, as in said patent, the end *c* is turned up to form a wood-screw, and the ends of the staves are bored out and tapped so that the wooden end *c* will be screwed directly into the ends of the staves *a*, and the parts will not be liable to work loose or to break, and the end *c* can be glued into place, if desired; but by simply screwing the parts together there is opportunity to take the end *c* out and substitute another. This is especially useful with crutches for children, because they can be lengthened as the person grows. The end of *c* is made with a screw for the ferrule *e*, and the rubber tip *f* is held into this ferrule by the screw-clamping ring *i*, shown separately in Fig. 5. This clamping-ring is split and the screw and ferrule are sufficiently tapering to cause the tip to be clamped in the act of screwing the ring *i* into the ferrule. By this construction the tips can be easily removed and others substituted as they wear out.

The tips of crutches and the heels of boots and shoes have been made of rubber, so as to be elastic and water-proof or to prevent slipping. They answer very well when the surface is dry, but in wet weather the rubber slips and frequently allows the person to fall. To avoid this I make the rubber block or layer by winding up a strip of heavy canvas with a layer of India rubber and vulcanizing the rubber while under pressure so as to firmly hold the canvas. In this way the edge of the canvas will form a mop or series of projecting fibers, and the surface of the rubber will never become smooth, but will be sufficiently rough to prevent the rubber slipping upon a wet surface. At the upper ends of the staves *a* are the metal sleeves *b*, and the ends of *a* are made as tapering tenons to enter the sockets of the metal crotch-plate *m*, to which they are secured by screws entered from above. By this construction the parts are firmly attached, and they can be tightened up from time to time as they may wear loose, or the parts can be separated whenever necessary. The padding of the crutch is supported upon the hoop or open skeleton-frame *r*, shown in Figs. 2 and 3. The covering is stretched over this frame and held firmly by a cord or gathering-string, and the stuffing of hair or similar material is inserted through the opening, and the edges of the covering fold down upon the under side of the frame. The pad when complete is attached to the crotch-plate *m* by the screw *n* entering the nut *o* attached to or formed with the frame *r*. This way of constructing the parts allows for greater depth and elasticity of packing, and enables me to apply the covering to the frame first and then to introduce the elastic stuffing from behind, and when complete the folds of the covering and the gathering-string are out of sight, being covered by the crotch-plate. The hand-piece *t* is made with a rod through it, projecting as pins at the ends that enter holes in the staves, and these holes are made at different points so as to allow of the hand-pieces being placed to suit the person, and said holes pass only about half through the staves so as not to weaken it. The cylinders *u* are applied around the staves *a*, and they have holes for the pins *v*, and the pins *v* are notched contiguous to the hand-piece, so that the hand-piece and staves will be con-

nected by the cylinders being slipped endwise down the staves after the parts are together and cause the metal of the cylinders to enter such notches.

I claim as my invention—

1. The staves *a a*, beveled and inserted into the metal sleeve *b*, in combination with the changeable wooden extension *c*, having a screw-tenon entering said staves *a* within the sleeve *b*, as and for the purposes set forth.

2. The rubber-and-canvas block or layer *f*, made as specified, for preventing slipping, as set forth.

3. The crotch-plate *m* with tapering sockets,

into which the upper ends of the staves *a* are secured by the screws, as set forth.

4. The frame *r* for the elastic padding of the crutch, attached to the crotch-plate *m* by the screw *n*, as set forth.

5. The hand-piece *t* and projecting notched pins *v*, in combination with the staves *a a* and cylinders *u*, as and for the purposes specified.

Signed by me this 7th day of February, A. D. 1872.

LUCIUS CRANDALL.

Witnesses:

GEO. T. PINCKNEY,

CHAS. H. SMITH.