

No. 828,221.

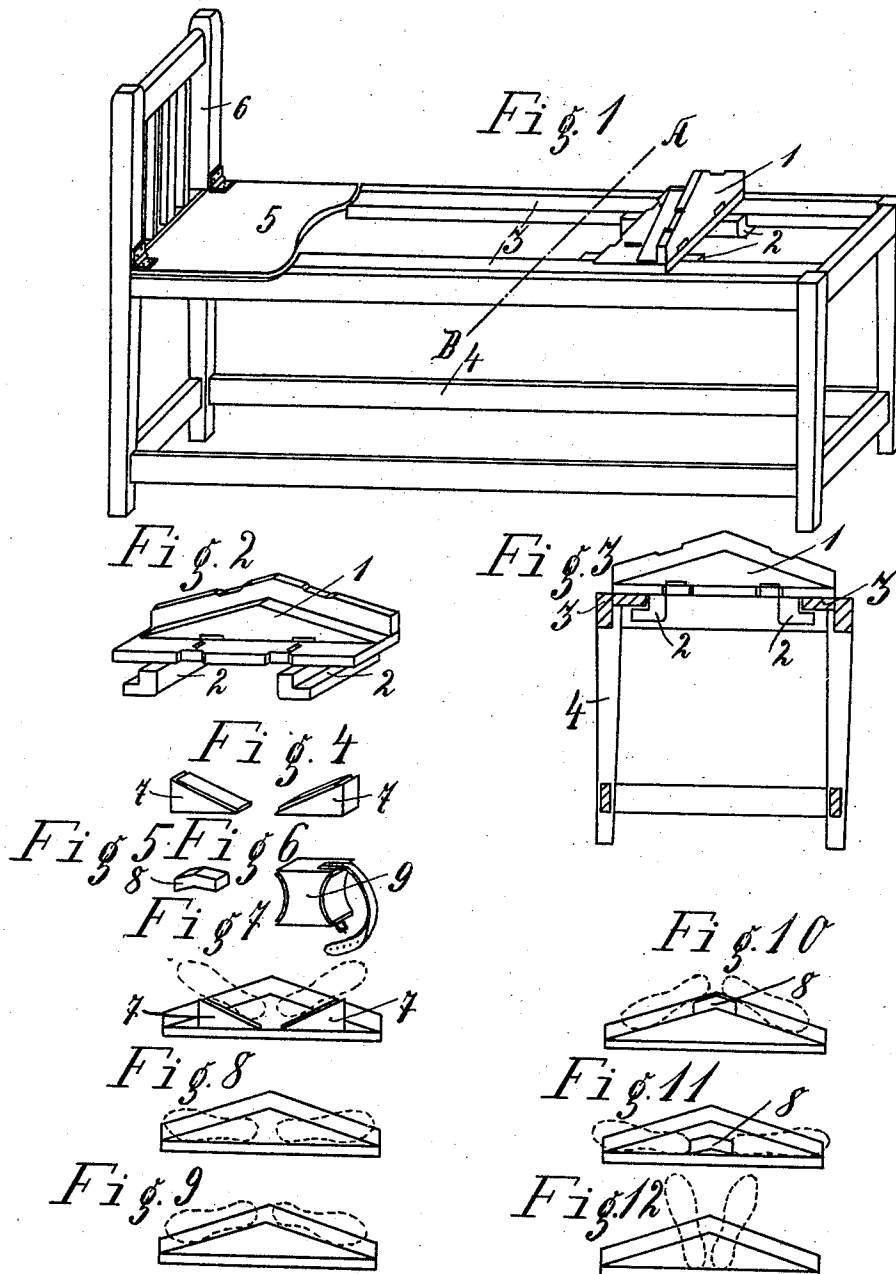
PATENTED AUG. 7, 1906.

F. LANGE.

EXERCISING APPARATUS FOR CORRECTING DEFORMITIES.

APPLICATION FILED APR. 22, 1905.

2 SHEETS—SHEET 1.



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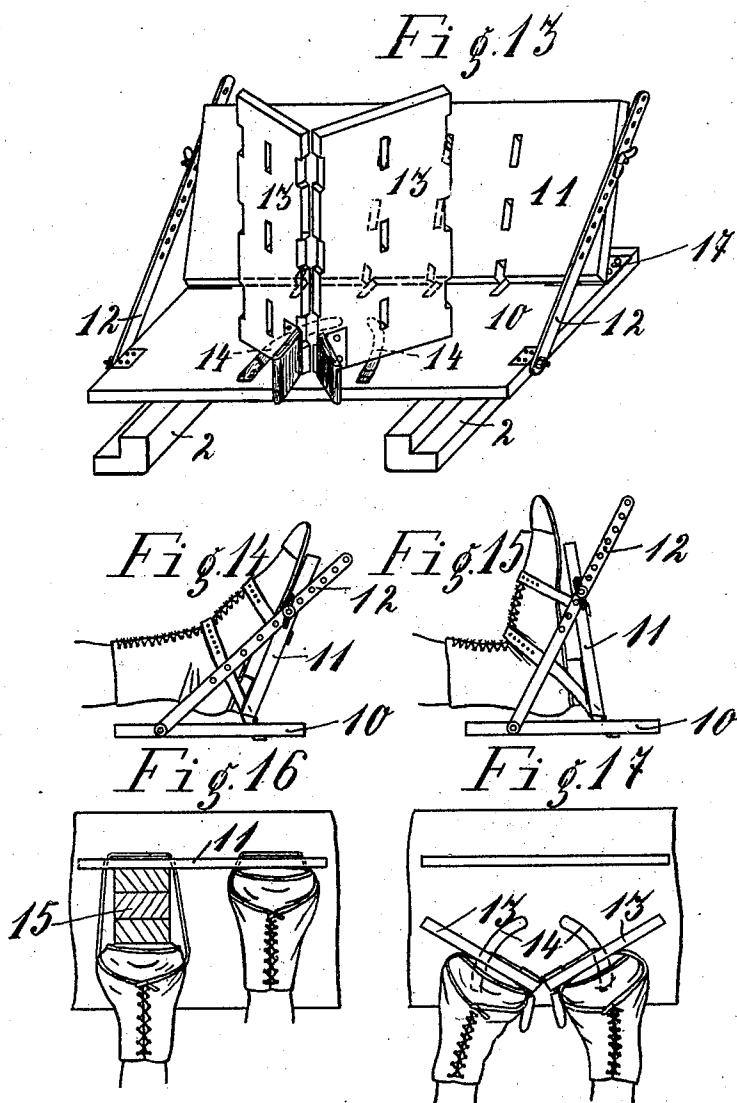
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# UNITED STATES PATENT OFFICE.

FRANZ LANGEL, OF COLOGNE, GERMANY.

## EXERCISING APPARATUS FOR CORRECTING DEFORMITIES.

No. 828,221.

Specification of Letters Patent.

Patented Aug. 7, 1906.

Application filed April 22, 1905. Serial No. 256,871.

*To all whom it may concern:*

Be it known that I, FRANZ LANGEL, a subject of the King of Prussia, German Emperor, residing at Cologne, in the Province of the Rhine, Kingdom of Prussia, German Empire, have invented a new and useful Exercising Apparatus for Correcting Deformities, &c., of which the following is a specification.

This invention has for its object improvements in apparatus such as is described in the specification of United States Patent No. 714,309 for stretching or straightening legs, &c. Such apparatus consisted of a block provided with straps or the like to which the feet were so fastened that when the heels were laid together the feet stood at about one hundred and eighty degrees to one another. The block was laid on a chair or the like and was drawn to and fro by the patient as he stretched out and drew in his legs alternately. Such apparatus is not effective, especially when it is a question of correcting peculiar deformities of the legs, because, first, in order to lighten the exercise the patient involuntarily turns the movable block into a wrong position, thus rendering the apparatus largely useless, and, secondly, because the feet and legs must be held in the proper positions, which cannot be effected by the simple block alone.

According to the present invention the block is arranged on a frame and is positively guided, while in connection with the block devices are provided for giving the necessary positions to the feet and legs for removing the deformities.

In the accompanying drawings, Figure 1 is a perspective view of the whole apparatus. Fig. 2 is a perspective view of the sliding block. Fig. 3 is a section through the apparatus on the line A B of Fig. 1. Figs. 4, 5, and 6 are detail views. Figs. 7 to 12 show diagrammatically the use of the block with the feet and legs in several different positions. Fig. 13 is a perspective view of a device which is used in place of the block for particular purposes and otherwise is used in the apparatus of Figs. 1 and 3 just as the block is used. Figs. 14 and 15 show the use of this device with broken legs and the like. Fig. 16 shows the use of the device of Fig. 13 with short limbs. Fig. 17 shows the use of the same device for correcting flat-footedness.

Figs. 1 to 3 show how a block 1, which in itself is already known from United States Patent No. 714,309, is provided beneath with guiding-lugs 2, which engage under the rails

3 of the frame 4, so that the block is always positively guided in a horizontal position. On frame 4 is provided a folding seat 5 with a back 6, the arrangement being such that when the seat is raised the block can be removed from the opening so left and can be again pushed onto the guide-rails therethrough. The patient takes his seat, and his feet are strapped tightly to the block 1. The exercise is brought about by pushing and pulling the block to and fro, while correct action is insured because the block cannot become tilted or turned, especially owing to the fact that the guide-lugs 2 are extended forward and backward.

The advantage of the positively-guided block is especially noticeable when peculiar deformities are to be corrected. If, for example, feet which are too much turned inward are to be spread, inclines 7, Fig. 7, sloping toward the center, are laid on the lowest stage of the block, engaging by dowels in corresponding holes in the same. The feet when they are strapped to the block are not at first fully turned to the desired ultimate position; but after they have become directed outward somewhat in course of exercising the arrangement of Fig. 8 and then that of Fig. 9 is adopted, in which latter the feet are laid in the known manner on the second stage of the block. Finally a small piece 8, Fig. 10, is laid on the summit of the second stage and is held by dowels and slots. By this means the feet are bent farther past the angle of one hundred and eighty degrees than can be effected by the device of Fig. 9 alone. If bow legs are to be treated, the piece 8 is fixed on the lowest part of the block 1, while the feet are so strapped to the same that the piece 8 lies between the heels, Fig. 11. The pressing together of the knees is thus facilitated. If the patient is knock-kneed, the block 9, Fig. 6, curved inward at both sides, is fastened to one leg by the straps provided on said block and is pushed between the knees, while the feet are attached to the block in any of the ways, according to circumstances. The knees are thus forced outward during the moving to and fro of the sliding block 1.

Fig. 13 shows a device for use in place of the block 1. The device is used like the block 1—that is to say, it works by guide-lugs 2 in the frame 4—and the engagement of said lugs with the rails 3 insures that the block shall always be positively guided in a horizontal

direction. On the guide-lugs 2 is a horizontal board 10, and a second board 11 is connected to the former by hinges 17. The boards 10 and 11 can be set at any desired angle relatively to one another by means of two iron bars 12, having holes therein. Boards 10 and 11 are provided with slots for receiving straps. For the special purpose of treating flat-footed persons an additional device is attached to board 10, consisting of two boards 13, hinged together vertically and adapted to be fixed on the board 10 by screws with winged nuts passing through the curved slots 14. In these boards 13 also slots are provided for straps. If this latter device is not to be used, it is removed.

The above-described apparatus is used in the following way: In subsequent treatment of broken limbs the feet are strapped down, as shown in Figs. 14 and 15, and by moving the legs in and out the muscles are well exercised and the desired effect is attained. Fig. 14 also shows the method of treating the feet of persons who always tread down first with the heel. By exercising in the position shown on the apparatus the upper foot-muscles are stretched, so that the point of the foot is brought downward to some extent. Fig. 15 shows the reverse case for persons who tread down too much with the toe. Here the muscles of the heel are stretched and the desired effect thus produced.

For correcting shortened legs, especially such as are caused by malformation of the pelvis, the device of Fig. 16 is employed. The short limb is strapped to the board 11, while between the normal leg and the board 11 a suitable number of pieces 15 are inserted, so that said leg lies in a bent position. If the stretching movements are now made by this latter leg, a certain pull is exerted on the short limb, so that after a time the pelvis comes again into its normal position.

For the treatment of flat-footedness, in which the person treads down first with the

inside of the foot, the arrangement of Fig. 17 is adopted, the additional device being screwed on and the feet strapped to the boards 13, as is seen in Fig. 17. If then the movements of stretching out and drawing back the legs are made, the muscles at the outer sides of the feet become stretched, so that after a certain amount of use the patient treads finally with the whole sole of the foot. With the progress of the exercising the angle between the boards is gradually reduced by adjusting the same toward one another, and the effect is consequently increased.

What I claim is—

1. An exercising apparatus for straightening limbs, correcting deformities and so forth, composed of a frame with horizontal guide-bars, of a seat in line with said guide-bars, and of a movable feet-supporter sliding on said guide-bars and provided with means to secure the feet in positions from less than ninety degrees to more than one hundred and eighty degrees, as specified.

2. An exercising apparatus for straightening limbs, correcting deformities and so forth, composed of a frame with horizontal guide-bars, of a seat in line with said guide-bars, and of a movable feet-supporter sliding on said guide-bars, composed of a slidable base-board 10 and a foot-rest 11 hinged thereto, provided with means to secure them under any desired angle, and of pivotally-connected boards 13, secured vertically but under different angles to each other upon the base-board 10, substantially as described and for the purpose set forth.

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

FRANZ LANGE.

Witnesses:

WILLIAM KUEPPERS,  
JOH. SCHOLZ.