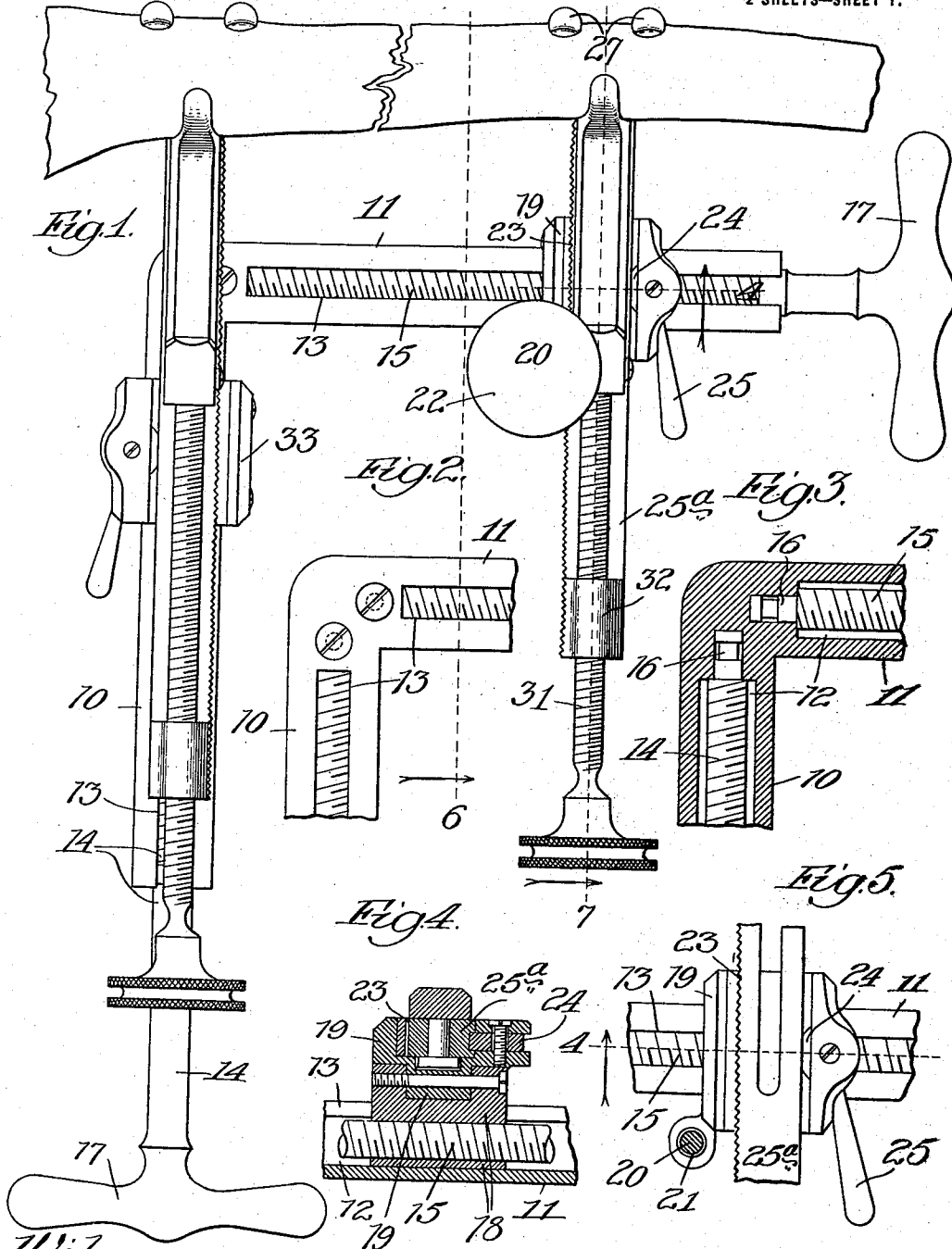


L. G. RINK.
BONE SETTING DEVICE.
APPLICATION FILED MAR. 30, 1916.

1,217,637.

Patented Feb. 27, 1917.

2 SHEETS—SHEET 1.



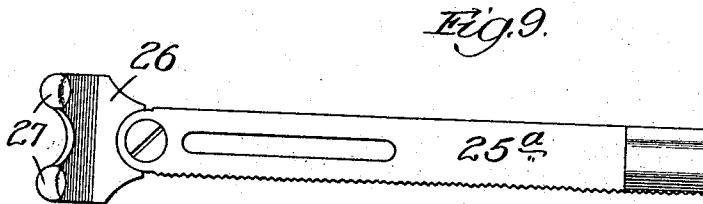
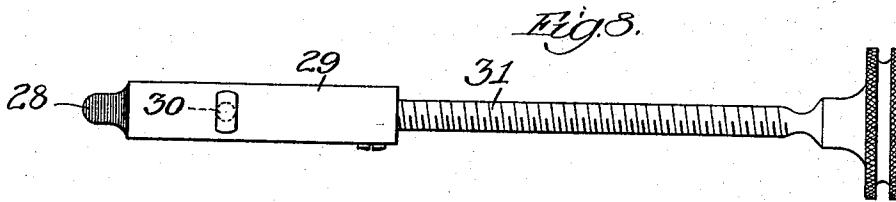
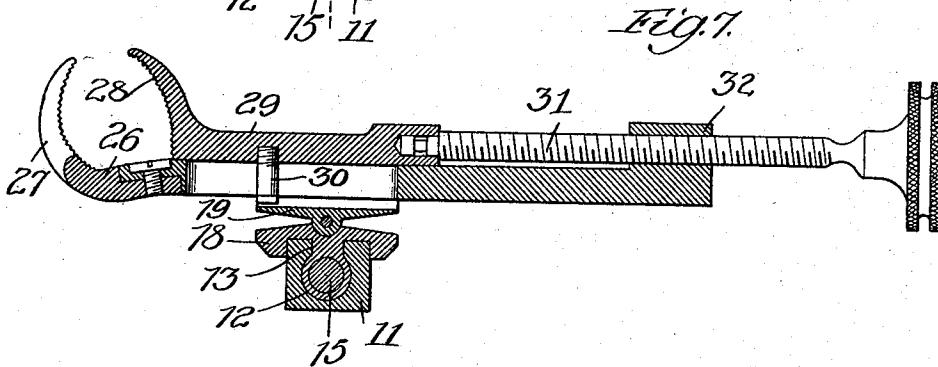
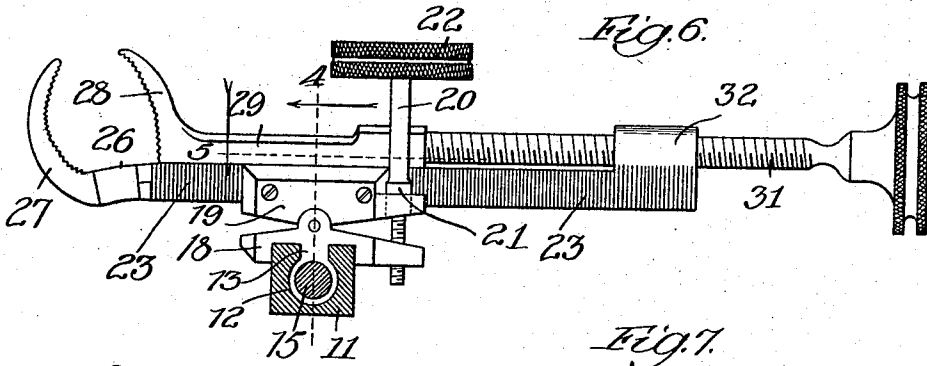
Witnesses:
E. C. Gaylord,
Irwin Bowman.

Inventor:
Louis G. Rink,
By *Deane Smith, Secy.*
Chas. H. Rink

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2 SHEETS—SHEET 2.



Witnesses:
E. C. Boyd,
Irwin C. Bowman.

Inventor:
Louis G. Rink,
By J. W. Smith, Attorney.

UNITED STATES PATENT OFFICE.

LOUIS G. RINK, OF WILMETTE, ILLINOIS, ASSIGNOR TO SHARP & SMITH, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

BONE-SETTING DEVICE.

1,217,637.

Specification of Letters Patent.

Patented Feb. 27, 1917.

Application filed March 30, 1916. Serial No. 87,665.

To all whom it may concern:

Be it known that I, LOUIS G. RINK, a citizen of the United States, residing at Wilmette, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Bone-Setting Devices, of which the following is a specification.

My invention relates to certain new and useful improvements in bone-setting device and is fully described and explained in the specification and shown in the accompanying drawings, in which:—

Figure 1 is a plan view showing the manner of operation of our device; Fig. 2 is a similar view of the frame corner with the clamp removed; Fig. 3, a horizontal section through the frame corner; Fig. 4 is a section on the line 4 of Figs. 1 and 6; Fig. 5 is a section on the line 5 of Fig. 6; Fig. 6 is a section on the line 6 of Fig. 1; Fig. 7 is a section on the line 7 of Fig. 1; Fig. 8 is a bottom plan of the upper or single-toothed bone-gripping jaw; and Fig. 9 is a top plan of the lower or two-toothed bone-gripping jaw.

Referring to the drawings, 10 and 11 are two legs of a right-angled frame-work, these two legs lying in the same plane. Each is provided with a longitudinal circular channel 12 and a slot 13 connecting the channel with the upper surface of the corresponding leg. Worms 14 and 15 are journaled in the circular channels, each having a reduced end 16 (Fig. 3) to furnish a bearing. Handles 17 are provided by which the worms may be rotated. The worm 15 has threaded upon it a block 18 which, by the rotation of the worm can be moved along the leg 11. This block has its top in the form of a broad wedge and to it is pivoted, on a pivot parallel to the worm 15, a guide-block 19. 20 is an adjusting screw threaded in a projection of the block 18 passing through a perforation in the guide-block 19 and engaging the same with a shoulder 21. The rotation of the adjusting screw, which is conveniently accomplished by a knurled head 22, rocks the guide-block about its pivot on the block 18. The upper surface of the guide-block 19 is provided with a guide channel which is at right-angles to its pivot and therefore at right-angles to the leg 11. One of the opposing vertical faces of this guide channel is provided with a series of small serrations 23 and the other surface is pro-

vided with a locking cam 24 which can be manipulated by a handle 25.

In the channel thus formed is mounted a bone-gripping clamp formed of two jaws. The lower jaw is shown in Fig. 9. It has a shank 25^a serrated along one edge to engage the serrations 23 of the guide channel and pivoted at its end is a finger piece 26 having two upwardly turned fingers 27. The upper jaw of the clamp is illustrated in Fig. 8. It has an upwardly projecting finger 28, which lies midway between the fingers 27 on the lower jaw, and a shank 29, which slides on the shank 25 of the lower jaw and is provided with a pin 30 which runs in a central slot in the shank of the lower jaw. Extending backward from the end of the shank 29 of the upper jaw is an adjusting screw 31 swiveled in the shank and threaded in a perforation in an upwardly projecting ear 32 on the lower jaw. It is obvious that the two jaws of the clamp can be brought together upon each other by adjusting the screw 31.

Upon the other leg 10 of the frame is mounted a block 33 adjustable by the worm 14 in precisely the same way as has heretofore been described. In fact, the block 33 is precisely like the block already described excepting that it is made in one piece and therefore the horizontal pivoting movement possible between the two parts 18 and 19 already described is omitted. The guide channel in the block 33 also runs parallel to the threaded passage therein, instead of at right-angles thereto, so that the adjustments of the block 33 and of the jaws which it carries are in the same direction instead of at right-angles. No further detailed description of this arrangement, however, will be necessary, since the description of the corresponding parts already described is sufficiently accurate.

The operation of the device can now be understood. When it is desired to set a broken bone, it being assumed that the fracture is of the type which requires the bone to be operated upon and laid bare, the two clamps are fixed to the two sections of the bone in as near proper relative position as possible. During this operation they are preferably removed from place in their respective guide channels, although this is, of course, not absolutely essential. In practice, however, one of the clamps is almost certain to be removed. After the clamps are

thus fixed in position, their respective guide channels are adjusted to receive them as conveniently as possible and to permit the desired movement to take place after they are secured therein. Since in this part of the operation, no effort is made to aline the bone sections, but little shift of the guide channels will ordinarily be necessary. When the structure is ready for the actual setting of the bone, the parts will be roughly in the position shown in Fig. 1, that is to say, one clamp will be firmly locked on each section of the bone and the respective clamps will be firmly engaged and locked in position in their respective guide channels. The guide block 19, however, may be in any angular position, so that the bone sections may not be in the same straight line, and they may be offset in more than one plane. When the parts are thus fixed in position the various adjusting devices are manipulated in succession to aline the bone perfectly. The sections can be moved relatively in the plane of the angular frame-work by adjusting the screw 14, and they can be adjusted in the opposite plane by adjusting the screw 22 and by manipulating these two screws the sections may be adjusted in both planes and brought in perfect alinement. They can then be brought into longitudinal contact by adjusting the screw 15 and when this is done the two sections will be in their original and natural positions and held in absolute and firm contact. The operating surgeon can then perform whatever surgical work may be necessary, as, for instance, screwing a silver plate to the sections so as to lap the joint and hold the sections firmly together.

I realize that considerable variation is possible in the details of this construction without departing from the spirit of my invention; therefore I do not intend to limit myself to the specific form herein shown and described except as pointed out in the following claims, in which it is my intention to claim all the novelty inherent in the construction as broadly as is permitted by the state of the art.

What I claim as new and desire to secure by Letters Patent is:

1. A bone setting device comprising an angular member, a bone gripping clamp removably mounted on each part thereof and capable of being locked in initially adjusted position, and means to adjust both of said clamps relatively in two directions in the same plane to aline the bone sections and

move them longitudinally into engagement after the initial adjustment.

2. A bone setting device comprising an angular member, a bone gripping clamp mounted on each part of said angular member, means whereby said clamps may be locked in initially adjusted position, means for subsequently adjusting the clamps relatively in two directions in the same plane and a third adjusting means operable in a direction transverse to the plane of the first adjustment whereby the bone sections may be alined and moved longitudinally into engagement.

3. A bone setting device comprising a channeled angular member, blocks on each part of said angular member, bone gripping clamps removably mounted in said blocks, means for locking the clamps in initially adjusted position in said blocks, and means adapted to move the blocks relatively in two directions in the same plane to aline the bone sections and then move the bones longitudinally into engagement.

4. A bone setting clamp comprising an L-shaped channeled member, a block mounted upon each part of said member, bone setting clamps adapted to be initially adjusted with said blocks and locked therein, auxiliary means to adjust the clamps relatively in two directions in the same plane, and a third adjusting means carried by one of said blocks adapted to permit adjustment of one of the clamps in a plane transverse to the first mentioned plane.

5. A bone-setting device comprising an angular frame, clamp-holders on the frame, means to adjust one clamp-holder in one direction and the second in a direction at right-angles thereto, and bone-engaging clamps adjustably and removably mounted in the clamp-holders.

6. A bone-setting device comprising an angular frame, clamp-holders on the frame, means to adjust one clamp-holder in one direction and the second in a direction at right-angles thereto, bone-engaging clamps adjustably and removably secured in the clamp-holders, one clamp-holder having in addition a pivotal adjustment to move its clamp in a plane transverse to the frame.

In testimony whereof, I have hereunto set my hand this 27th day of March, 1916.

LOUIS G. RINK.

In presence of two subscribing witnesses:
L. HEISLAR,
C. BREWER.