

## CLAMP FOR LINING UP FRACTURED LONG BONES.

BY WILLARD BARTLETT, M.D.,

OF ST. LOUIS, MO.

DR. RICHARD H. HARTE, in his Presidential address before the American Surgical Association, in June of this year, felt it sufficiently important to discuss the care of fractures of the long bones. Among his many excellent remarks regarding operations of the kind under consideration here, he said:

"These operations are often most difficult, requiring a special type of instruments and a thorough surgical technic (which is not in the province of every man who considers himself a surgeon), and the wounds are more prone than any other class of wounds to infection, and the risk to life and limb is thereby proportionately increased."

Since this question has been brought to the attention of surgeons, there has been a revival of interest in the treatment of fractures, especially in that most modern method of operative treatment, the use of the Lane bone plate.

The perfection of the mechanical devices and instruments for use in the Lane plate operation is so important that various eminent surgeons, having experienced this need, have offered a number of excellent suggestions. Dr. Edward Martin, of Philadelphia, presented an elaborate outfit of instruments for such use, at the Denver meeting above mentioned.

Any surgeon who has had personal experience in the use of Lane's bone plates, appreciates that, in the treatment of recent fractures, no open operation is justified unless ideal approximation is to be obtained. This means that all the fragments must dove-tail perfectly.

Great difficulty is generally experienced in perfectly lining up two main portions of a broken long bone. A few millimetres tend almost invariably to prevent the axes of both from coinciding. In addition to this is the very important

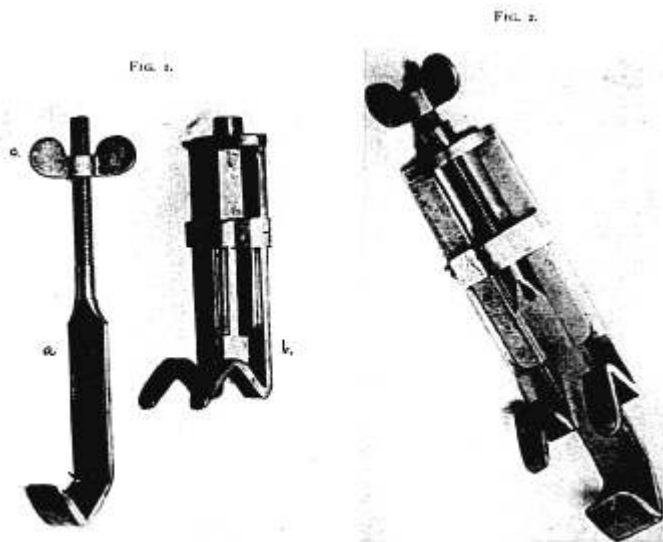
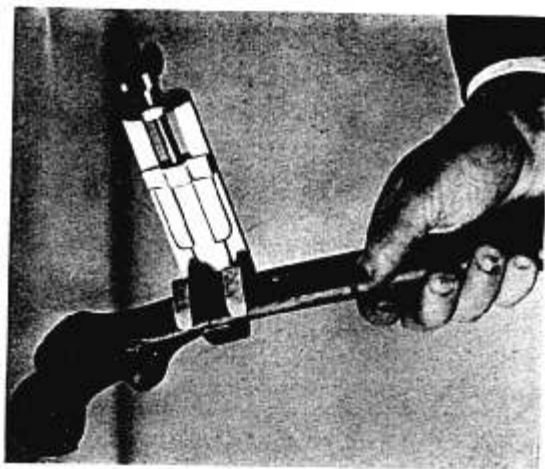


FIG. 1.—Shows three parts of instrument. (a) male blade; (b) female blade; (c) butterfly screw.  
 FIG. 2.—Showing front view of clamp.

FIG. 3.



Shows the clamp in position grasping bone.

consideration of the unequal rotation in the two parts of the bone, which goes far in preventing an ideal approximation. These, of course, are largely mechanical difficulties which require a mechanical solution.

The instrument under consideration in this paper is designed to meet this need. In a previous article which was published in the *Journal of the American Medical Association*, Oct. 21, 1911, vol. lvii, pp. 1347-1351, entitled "Experimental and Clinical Work to Determine the Value of Lane's Bone Plating," is described an embracing instrument. This appliance was originally intended for the purpose indicated in that article. It is, however, a step in the development of the instrument herein discussed.

The three accompanying illustrations give a clearer idea of the clamp than any description in words could possibly do.

Fig. 1 shows the three separate parts of the instrument. (a) The male blade of the clamp. (b) The female blade. This slips down easily over the threads of the screw part of the male blade; it rests on the upper surface of the bone, and opposes the male blade which tends to support the fracture from beneath. (c) The butter-fly screw, used for securing clamp in position, and for regulating the exact and necessary force required.

Fig. 2 shows the various parts of the clamp in general position, when in use.

Fig. 3 shows the clamp in position grasping bone. It will be noticed that the fracture appears on the upper surface, and in plain view.

Following is the technic for using this clamp on the femur: First procedure: As soon as the bone ends are exposed, all blood-clots, early granulations, or tissue fragments should be carefully picked out of the fracture planes with a pointed instrument or brush. Second: Over-traction is then exerted on the foot until one centimetre space exists between the ends of the fragments. Third: One or the other fragment is then rotated until the bony ridges or the corre-

sponding fragments show that the bone is in proper position, or as nearly correct as the eye can judge. Fourth: While in this position, the long or male blade of the clamp can be easily slipped down under the fracture line. Then as quickly as possible, the female or upper half of the instrument should be superimposed. Screw the butter-fly nut down tight. This brings the opposing right-angled planes toward one another. Thus the fragments of the bone are brought into line. Fifth: When the correct position of the bone is thus well secured by the clamp, the traction on the broken member may then be released. The muscle tension, aided by a blow on the heel, dovetails all the fragments. It may be necessary to slightly loosen the clamp for this purpose. Sixth: The clamp is now loosened sufficiently to receive the bone plate, which is inserted in the right angle of the upper lips of the clamp, after which the nut is screwed down hard. Care should be taken that the plate is well suited in size to the fracture, and that the screw holes, or at least a sufficient number, fall on sufficiently strong bone tissue. Seventh: The drilling and screw driving may now be accomplished without any of the labor ordinarily incident to keeping the fragments in more or less accurate approximation. Should the clamp cover a screw hole, as it often does, a screw can be put in on either side of the fracture, the clamp shifted, and other screws then secured.

There are a number of advantages which especially characterize this instrument.

(1) It is open above, so that the fracture line may be seen at all times.

(2) It holds the plate firmly on the bone, and supports the whole while the screws are being driven.

(3) It is easy to place in position, since each half is applied or removed separately.

(4) It consists of four inclined planes so disposed that fragments of any shape or size are driven to a common axial centre.