(No Model.)

E. CAMERON.

LOCK HINGE FOR RULES AND PROTRACTORS.

No. 422,374. Patented Mar. 4, 1890.

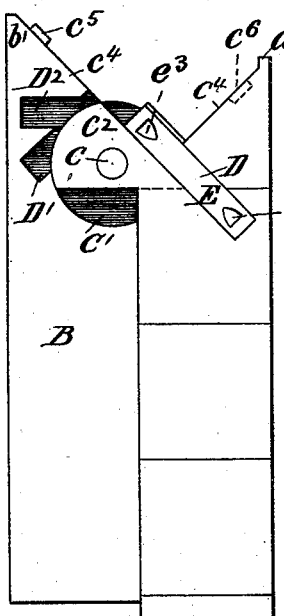

Fig.1.

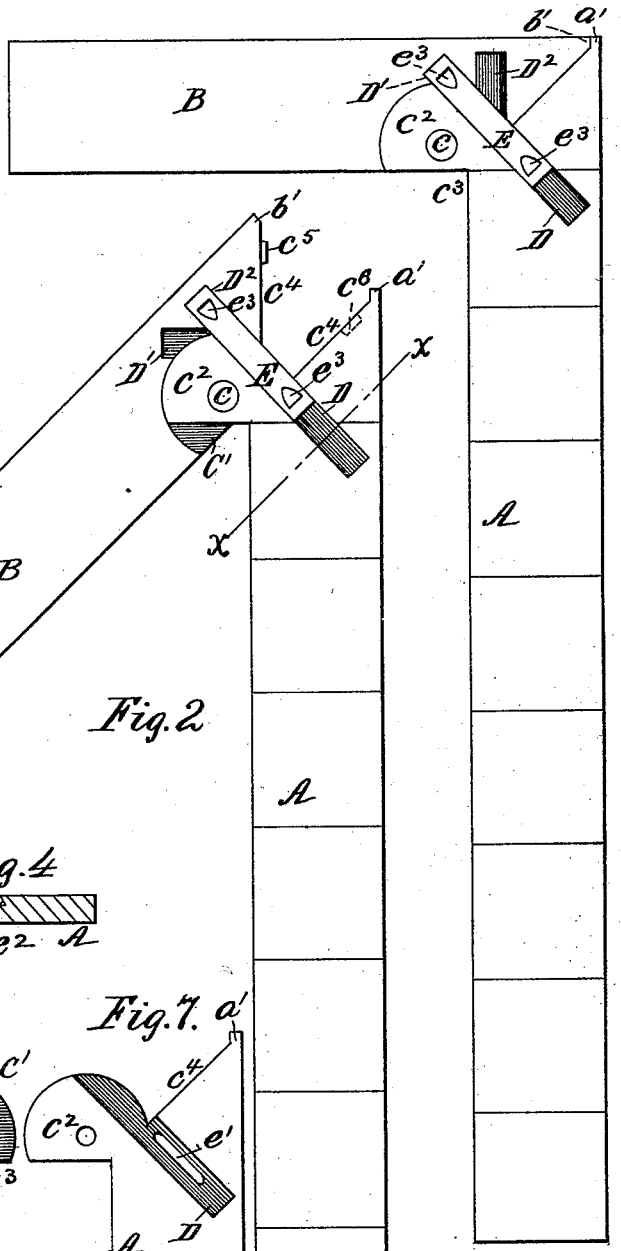

Fig.3.

Fig.2

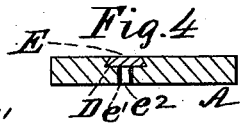

Fig.4

Fig.6.

Fig.7.

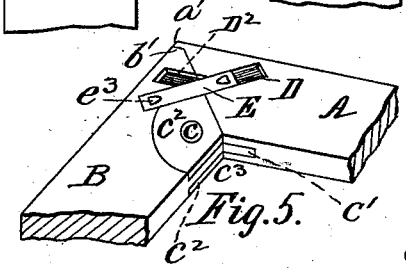

Fig.5.

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UNITED STATES PATENT OFFICE.

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LOCK-HINGE FOR RULES AND PROTRACTORS.

SPECIFICATION forming part of Letters Patent No. 422,374, dated March 4, 1890.

Application filed June 17, 1889. Serial No. 314,616. (No model.)

To all whom it may concern:

Be it known that I, ELMORE CAMERON, a citizen of the United States of America, and a resident of the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Lock-Hinges for Rules and Protractors, of which the following is a specification.

The several features of my invention and the various advantages resulting from their use, conjointly or otherwise, will be apparent from the following description and claims.

In the accompanying drawings, making part of this specification, Figure 1 is a side elevation of a square embodying my invention, the square being open and the angle made by the two arms or blades of the square being at right angle. Fig. 2 is a side elevation of the same square when the inclosed angle made by the two limbs thereof is one of forty-five degrees. Fig. 3 is a side elevation of the square when the limbs are closed together and the use of the square as a square is temporarily dispensed with. Fig. 4 is a transverse section of the square, taken at the dotted line x x of Fig. 2. Fig. 5 is a view in perspective of the corner of the square, showing the top and inner edge thereof. Fig. 6 is a side elevation of one of the arms. Fig. 7 is a side elevation of the other of these arms, the arms in these two last-named views being shown separate from one another.

A indicates one arm of the square, and B the other arm thereof. These two arms are hinged together at C by a pivotal connection. The preferred form of connection consists of a tongue or thin edge C′ on one of the arms fitting into between the portions C^2 C^2 of the other arm, and there connected to one another by the pivot C. Both the portions C^2 C^2 and the portion C′ are cut away at C^3, so that the point of the angle formed at the junction of the arms and lying between them can be utilized. Those ends of the arms which when the said arms are at right angles come together are beveled at C^4, substantially as shown. For adding stiffness to the square when the arms are at right angles to one another, a stud C^5 is located on one of these beveled edges C^4 and a recess C^6 (shown by dotted lines in Figs. 2 and 3) is located in the other of these beveled edges C^4. When the arms are at right angles to each other the stud C^5 fits closely into the recess C^6 and assists the hinge in keeping the respective sides of the arms in the same plane.

The extreme end a' of the arm A adjacent to its bevel C^4 and the extreme end b' of the arm B adjacent to its bevel C would ordinarily terminate in a point. Such a point would be easily and often broken. To prevent such an accident, I make these ends a' and b' blunt, and for the further protection of the corners of the rule when the same is opened and set as a square the end a' of the arm A is built or extended out from the bevel-line and forms a right-angled end. The terminus b' of arm B is such that the bevel-line C^4 stops before reaching the outer line or edge of arm B, thereby leaving a flat end whose plane is at right angles to the plane of the said edge. The distance from the end b' of arm B to the center of pivot C is less than the distance of end a' from the center of pivot C, and when the rule is opened the end b' fits closely within and against the inner side of the end a', as shown in Fig. 1. Thus the ends of the rule are strengthened against injury when the arms of the rule are closed together, as in Fig. 3, or more or less separated, as in Figs. 1 and 2.

My improved device for setting the arms in relation to one another at any of the angles hereinafter named is as follows: A channel or recess D is formed in the arm A. In the other arm B are formed channels or recesses similar to the channels D of the arm A. As many of these recesses are present in arm B as there are angles at which the arm B is to be set with reference to the arm A. For example, in the present illustrative instance the arm B may be set either at a right angle to the arm A or at an angle of forty-five degrees thereto, these being the angles (in this instance) for the marking or measuring of which it is designed that the rule or square shall be used. Therefore the open end of the recess D′ of arm B meets and matches the open end of recess D of the arm A when the arm B of the rule is at right angles to the arm A, and the open end of the recess D^2 of arm

B meets and coincides with the open end of the recess of arm A when these two arms make the angle inclosed between them one of forty-five degrees. These recesses are formed to receive a latch or setting piece E, and to retain said piece within their embrace and at the same time permit the said piece to slide loosely longitudinally within them. For this purpose the latch-slide E is provided with beveled edges, so that the breadth of that face of the latch-slide E which is nearest the middle portion of the arms between the broad faces of the arms is greater than the breadth of that face of said slide which is substantially flush with the outer adjacent face of the arm. For the same reason the bottoms of the grooves D D′ D^2 are each wider than the tops or portions of said grooves which lie at the face surface of the arms. The grooves in shape conform closely to the shape described by the bottom and sides of the sliding latch, and the sides of said grooves are in close proximity to said sliding latch when the latter is slid into them.

To allow the latch to be withdrawn from any designated groove of the opposing arm in order to be inserted into another groove thereof, one of the grooves, as D, is made longer than the rest. For preventing the latch-slide E from slipping out of groove D when the arms are in the position shown in Fig. 3, any suitable means may be employed. A convenient means for this purpose is as follows: The bottom of the groove D is provided with a slot e', running lengthwise in said groove. A pin or stud e^2, fixed to the latch-slide, passes down through the slot e'. Obviously this pin e^2 limits the longitudinal movement of the latch-slide E within the groove. For convenience of manipulating the slide E, the upper surface has two depressions or niches e^3, respectively located near the respective ends of the latch-slide, to receive the thumb-nail of the workman and the better enable him readily to slide the latch back and forth.

The mode in which my rule is adjusted is as follows: Suppose the two arms A and B lie alongside of each other, as in Fig. 3. If it be desired to use the rule as a right-angled one, the arms A and B are separated until the groove D′ of the arm B is in longitudinal line with the groove D of the arm A and the open ends of said grooves meeting and coinciding. The latch-slide E is then advanced and slid forward into the groove D′, as shown in Fig. 1. The rule is then a true square and is for use as one. To adjust the arms A and B so that they include an angle of forty-five degrees, the latch E is returned to its first position—viz., that shown in Fig. 3—and the arms A and B are then moved until the groove D^2 is in line with the groove D, and the two form a continuous groove. The latch E is now advanced into the groove D^2, as shown in Fig. 2, and the rule is then fixed for use in measuring between the arms A and B an angle of forty-five degrees. To replace the arms in the position shown in Fig. 1, the latch E is retracted from groove D′ to its position shown in Fig. 3 and the arms A and B are then brought together, as shown in said last-named figure.

Where it is desired to have the rule capable of measuring angles other than those heretofore mentioned, the rule can be readily made capable of such functions by providing grooves, as D′, in the arm B at a proper angle, so that when the arm B makes said interior angle of the desired angle the groove of arm B shall be in line with groove D of arm A, and the latch E can be slid into said groove of arm B in the manner hereinbefore mentioned.

While the various features of my invention are preferably employed together, one or more of said features may be used without the remainder.

What I claim as new and of my invention, and desire to secure by Letters Patent, is—

1. The combination of the pivoted arms A and B, provided with means for setting and holding them at a given angle with reference to each other, the arms each provided with a bevel C^4 and one of them terminating in the blunt end b' and the other arm terminating in the blunt end a', overlapping the end b' when the rule is used as a right-angled square, substantially as and for the purposes specified.

2. In a rule, the combination of the arm B, provided with the tongue C′, cut away at C^3, and the arm A, provided with recess into which fits said tongue C′, the sides of the recess C^2 projecting beyond the inner edge of arm A and cut away at C^3, the arms being pivoted together at C, those portions of the tongue C′ and of the extensions C^2 abutting on the space C^3 forming, with the inner edges of the arms A and B, a right angle when the arms A and B are at right angles to each other, substantially as and for the purposes specified.

3. The combination of the pivoted arms, tongue C′, and recessed extensions C^2, groove D, and one or more grooves, as D′, located in the body of the arm B and outside of the periphery or outer edge of the hinge, latch E, provided with extension pin or stud e^2, and arm provided with slot e', substantially as and for the purposes specified.

4. The combination of the pivoted arms, tongue C′, and recessed extensions C^2, groove D, and one or more grooves, as D′, latch E, provided with extension pin or stud e^2, and arm provided with slot e', the grooves and the latch being in cross-section dovetailed to prevent the latch from rising from said groove, substantially as and for the purposes specified.

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Attest:
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