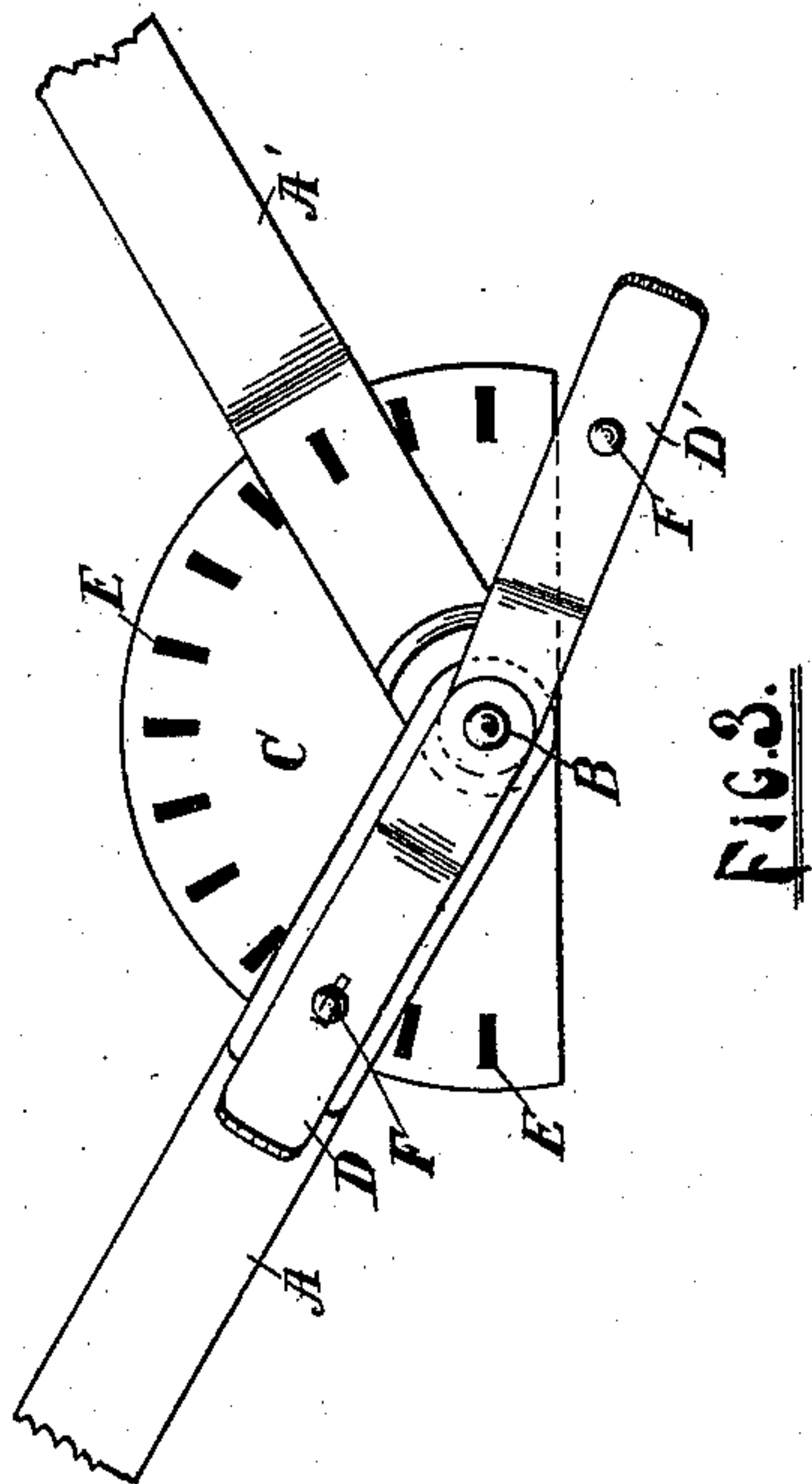
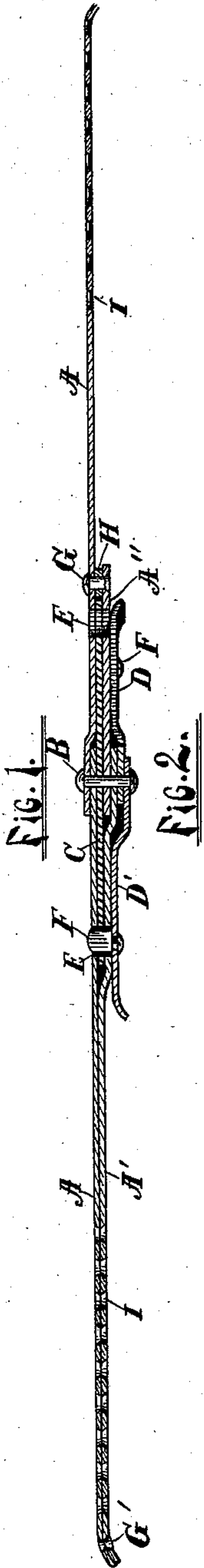
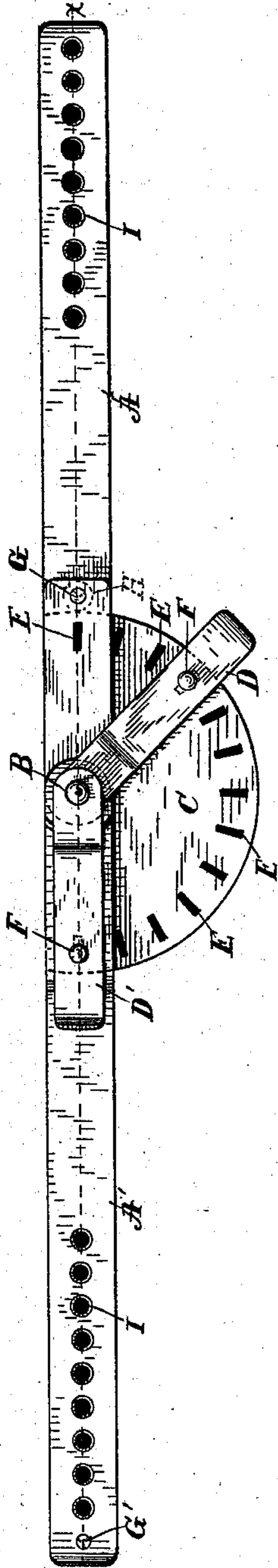


(No Model.)

W. H. DE CAMP.
FRACTURE APPARATUS.

No. 401,933.

Patented Apr. 23, 1889.



Witnesses,

John A. Parks
Mark M. Powers.

Inventor

William H. De Camp.

By His Attorney

Luther V. Moulton.

UNITED STATES PATENT OFFICE.

WILLIAM H. DE CAMP, OF GRAND RAPIDS, MICHIGAN.

FRACTURE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 401,933, dated April 23, 1889.

Application filed July 9, 1888. Serial No. 279,462. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. DE CAMP, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Hinge-Joints for Surgeons' Splints; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in the hinge-joints of bars or strips used to connect surgeons' splints; and the objects of my invention are to provide a joint that can be readily adjusted and secured; that will not require a screw-driver, wrench, or other tools to manipulate; that will be compact and convenient; that will not become loosened or have lost motion in the joints while in use; that can be adjusted at any angle, either upward or downward, and that can be stopped from moving beyond a certain point in one direction and free to move in the other direction, or released entirely, at pleasure. I accomplish these results by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan of a connecting bar or strip for surgeons' splints provided with my device; Fig. 2, a horizontal section of the same on the line $x x$ of Fig. 1; and Fig. 3, a plan view of the same, showing different adjustment of parts.

Like letters refer to like parts in all the figures.

A A are the bars or strips which connect the splints, to which they are attached at their outer ends by any suitable device engaging with the holes I, and connected at their adjacent ends by a rivet, B, to form a hinge-joint moving in the plane of their sides.

C is a segment of a disk (somewhat more than one-half) having an opening at its center for the rivet B, and a series of openings, E, having radial sides, said openings being arranged at equal distances from each other and at equal distances from the center B and also adapted to receive the stop-pins F. Said disk is located between the strips A A and the auxiliary strips A' A'', which latter are hinged at their adjacent ends, the same as A

A, by means of the rivet B, and secured at their outer ends to the strips A A by rivets G G'. These latter strips may be the same length of the strips A or A', or they may extend but little beyond the disk C, as at A''. These strips A A and A' A'' are separated a sufficient distance to embrace the disk C, either by bending, as shown in A', or by a washer, H. All of the described strips A are provided with openings E, corresponding with those in the disk C.

The stop-pins F have radial sides adapted to fit the openings E, and are attached to and held in place by the flexible springs D D', which extend a short distance beyond said pins, and are turned slightly outward at their outer ends for convenience of manipulation, and are pivoted at their inner ends upon the rivet B.

The operation of my device is as follows: All the parts being free to rotate about the rivet B, the openings E in the strips A can be made to coincide with any of the openings in the disk C and the respective stop-pins engaged with said openings in both. The joint can thus be locked either in a right line or at any angle. By detaching and changing ends with the device the angle is reversed in position, as shown in Fig. 3. By throwing either pin entirely outside the disk, as D', Fig. 3, the corresponding strip, A, is entirely free. By engaging the pin F in an opening in the disk only at one side of the strip A said strip is stopped by said pin in its movement in that direction only. By placing a strip at each side of the disk and securing their outer ends to each other any lateral flexion of the device will not release the pin by separating the parts, but will tend to compress the inner strip and press it toward the outer one, thus keeping the parts firmly in contact. The openings E and the pins F, being narrower at their inner sides, and the said pin moving away from the center B as it is withdrawn and toward the same as it is inserted, is firmly wedged between the converging sides of the openings and all lost motion avoided and taken up.

What I claim, and wish to secure, is as follows:

1. In combination with surgeons' splints, connecting-bars having a joint, and a disk

with its center coincident with the axis of
said joint, said bars and disk having open-
ings equidistant from said axis, and stop-pins
engaging with said openings, substantially as
5 described.

2. In combination with surgeons' splints,
connecting-bars having a joint, auxiliary bars
having a similar joint and attached to said
connecting-bars, said bars embracing a disk
10 with its axis coincident with that of the said
hinges, said bars and disk provided with open-
ings, and stop-pins engaging with said open-
ings, substantially as described.

3. In combination with surgeons' splints,

the combination of jointed bars having open- 15
ings for a stop-pin, a disk with center coinci-
dent with the joint of said bars and having
corresponding openings for said stop-pin, and
a stop-pin attached to a flexible spring piv-
oted at the center of said disk, substantially 20
as described.

In testimony whereof I affix my signature in
presence of two witnesses.

WILLIAM H. DE CAMP.

Witnesses:

JOHN H. KEMPIS,
LUTHER V. MOULTON.