

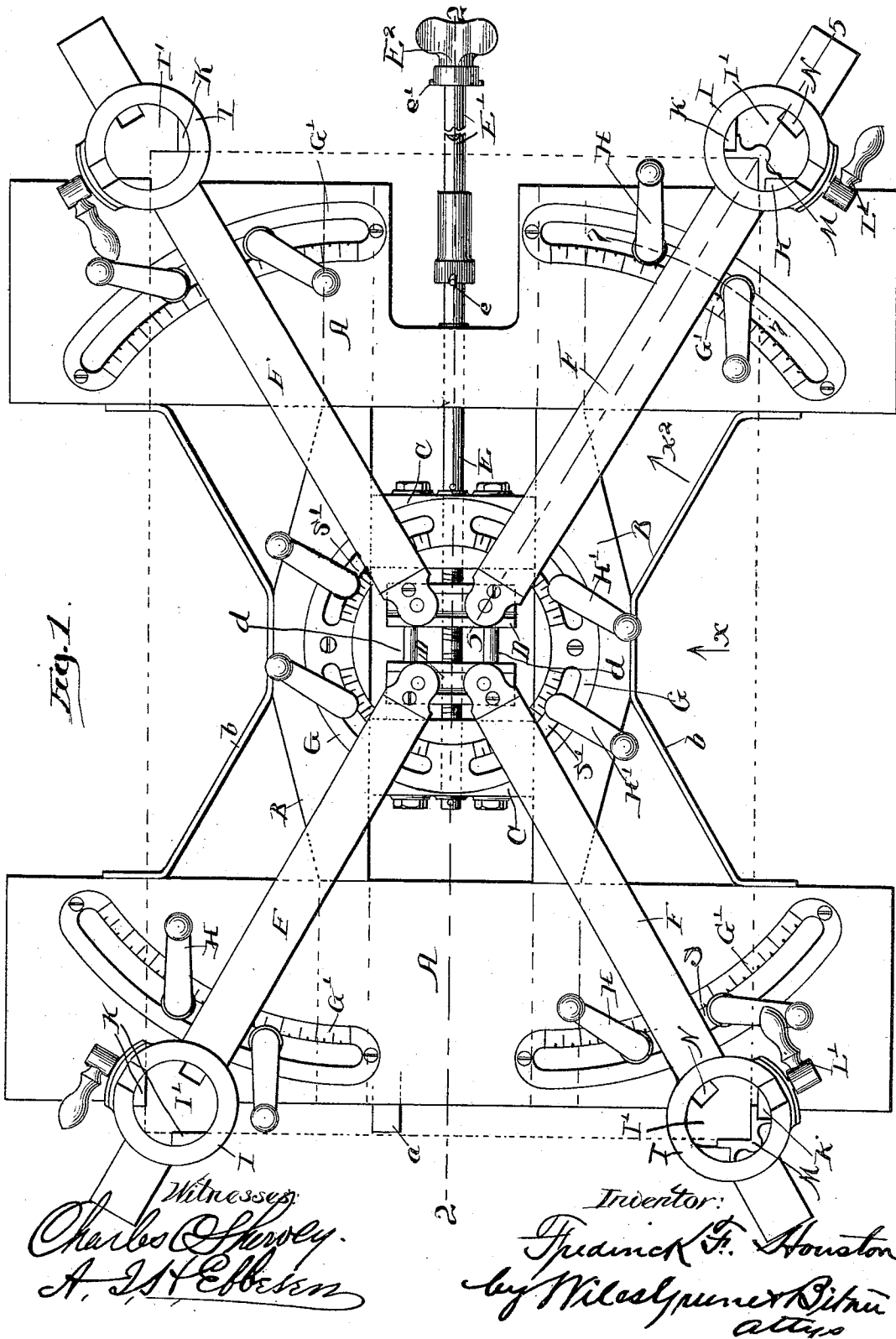
(No Model.)

3 Sheets—Sheet 1.

F. F. HOUSTON.
CABINET MAKER'S CLAMP.

No. 511,845.

Patented Jan. 2, 1894.



(No Model.)

3 Sheets—Sheet 2.

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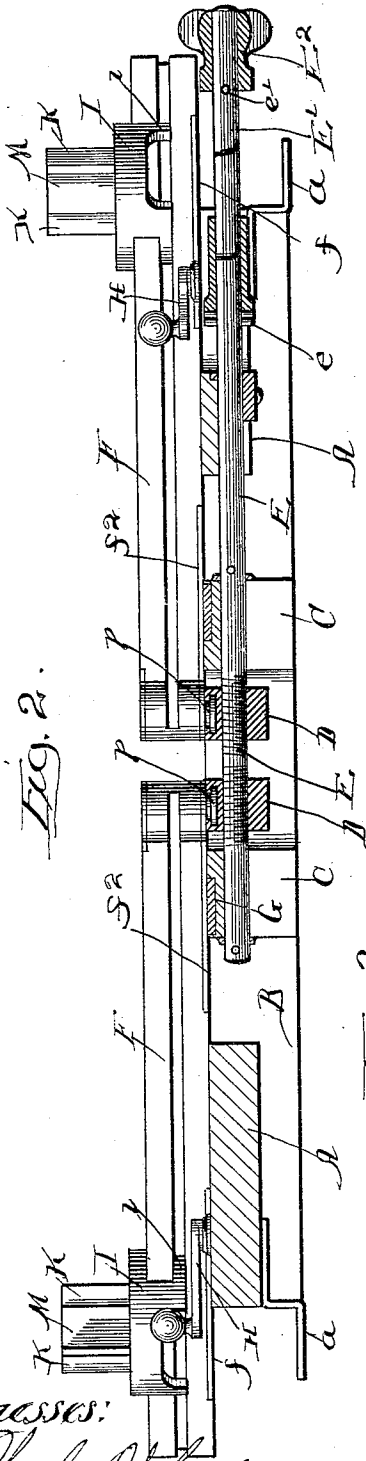


Fig. 2.

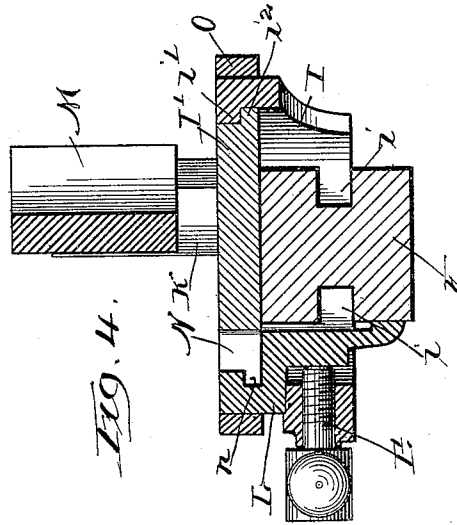


Fig. 4.

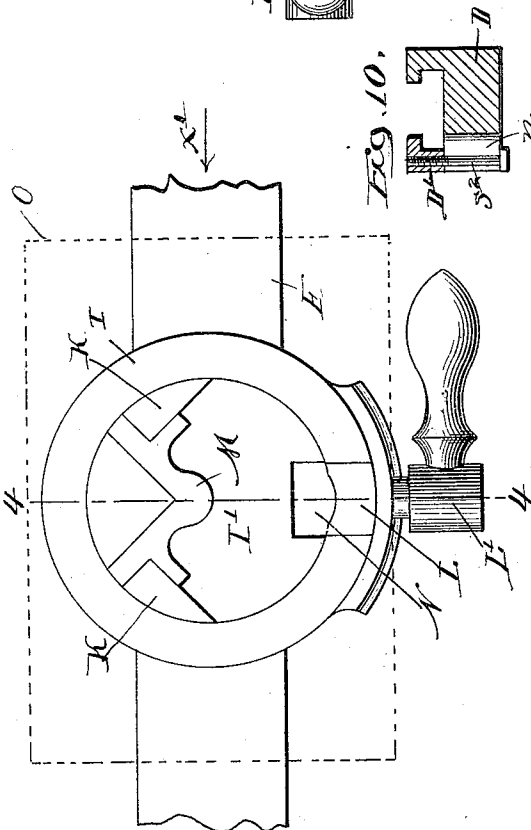


Fig. 10.

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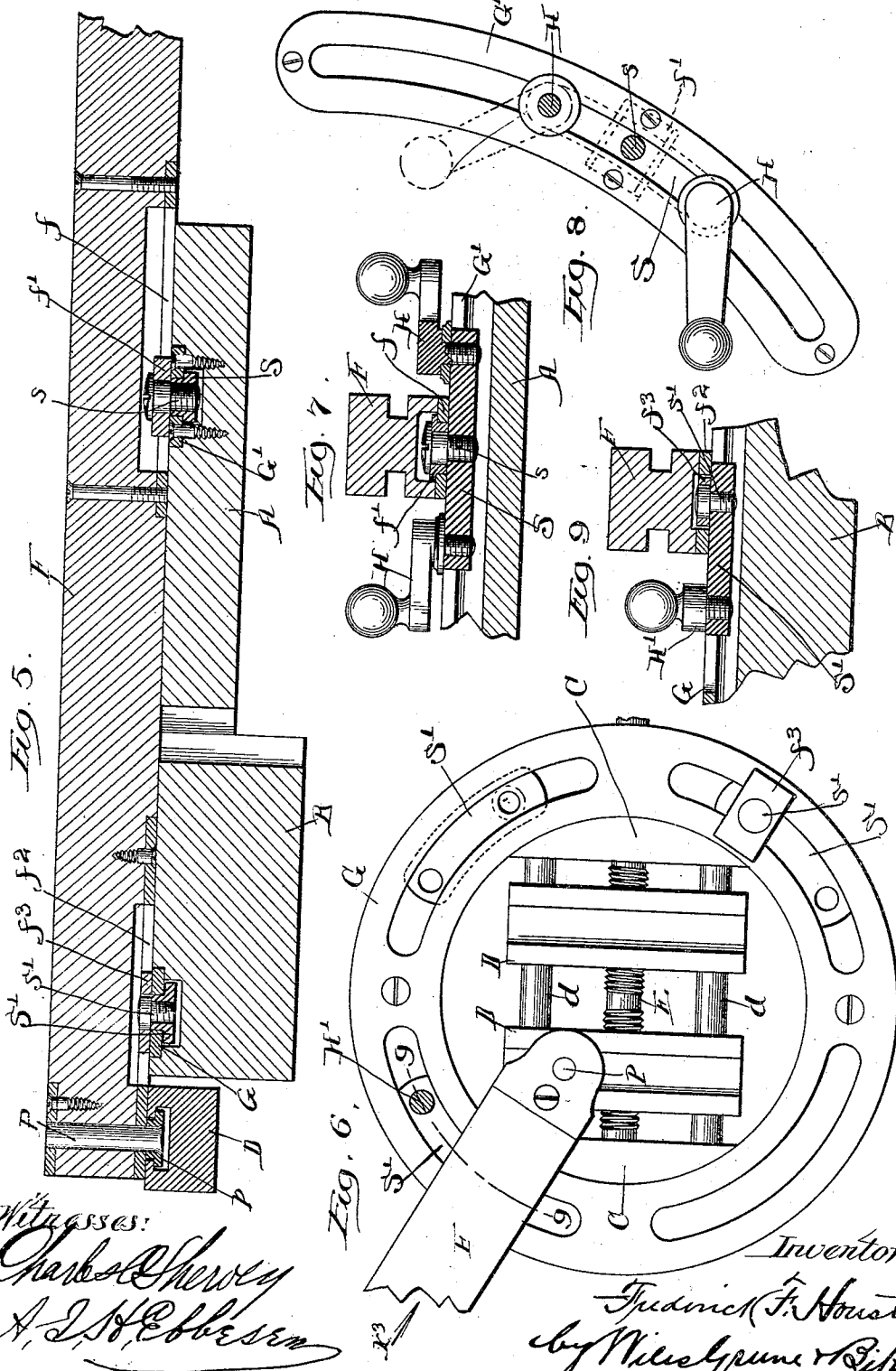
(No Model.)

3 Sheets—Sheet 3.

F. F. HOUSTON.
CABINET MAKER'S CLAMP.

No. 511,845.

Patented Jan. 2, 1894.



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UNITED STATES PATENT OFFICE.

FREDERICK F. HOUSTON, OF CHICAGO, ILLINOIS.

CABINET-MAKER'S CLAMP.

SPECIFICATION forming part of Letters Patent No. 511,845, dated January 2, 1894.

Application filed March 11, 1893. Serial No. 465,521. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK F. HOUSTON, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Cabinet-Makers' Clamps, of which the following is a specification.

My invention relates to improvements in cabinet makers' clamps of that class in which a number of radiating arms mounted on a suitable frame are provided with adjustable clamping blocks, and also with means for drawing them all toward a common center whereby an object placed between the blocks may be held securely by their pressure upon its margin.

The invention is fully described and explained in this specification and shown in the accompanying drawings, in which—

Figure 1 is a top plan of a clamp embodying my improvements. Fig. 2 is a vertical section through the line 2—2, Fig. 1, the view being in the direction indicated by the arrow, x , in said figure. Fig. 3 is a top-plan of one of the adjustable clamping blocks. Fig. 4 is a vertical section of the block through the line 4—4, Fig. 3, the view being in the direction indicated by the arrow, x' , in said figure. Fig. 5 is a longitudinal vertical section of one of the arms of the device and the parts connected therewith, the plane of section being through the line 5—5, Fig. 1, and the view being in the direction indicated by the arrow, x^2 , in said figure. Fig. 6 is an enlarged top plan of the central portion of the clamp, certain parts being removed to show construction. Fig. 7 is a vertical section through the curved line 7—7, Fig. 1. Fig. 8 is a top plan of one of the outer segments attached to the frame of the device. Fig. 9 is a vertical section through the curved line 9—9, Fig. 6, the view being in the direction indicated by the arrow, x^3 , Fig. 6; and Fig. 10 is a transverse vertical section of a modified form of the guide-bar, D.

In the views, A, A are the two transverse end-bars of the frame of my improved clamp, and B, B are two longitudinal bars connecting the bars, A, A, and strengthened by suitable braces, b , b .

C, C are two parallel transverse bars se-

cured between the longitudinal bars, B, B, and D, D are two parallel transverse guides sliding on rods, d , d , set in the bars, C, C. The guides, D, D, are formed with longitudinal dovetailed grooves in their upper faces and are connected by a right and left hand screw, E, passing through them and extending in one direction to the end of the frame. The outer end of the rod, E, is provided with a projecting pin, e , adapted to receive the notched hub of a wing-nut, E^2 , or to be connected with the wing-nut by an intermediate rod, E' , provided at one end with a notched hub adapted to engage the pin, e , and at the other end with a pin, e' , adapted to engage the notched hub of the wing-nut, E^2 . In ordinary use, the wing-nut, E^2 , may be placed directly on the end of the rod, E, but when very large work is in the clamps, the rod, E, may be lengthened by the second rod, E' .

On the frame of the machine rest four diverging arms, F, F, each provided at its inner end with a pin, P, Fig. 5, extending downward from the arm and having at its lower end a dovetailed head, p , engaging the dovetailed groove in the corresponding guide, D, two of the arms being thus connected with one of the guides and two with the other.

It is evident that the rotation of the screw, E, must draw the guides, D, D, together or move them apart, thereby giving a corresponding movement to the inner end of the arms, F, F.

The angular position of the arms, F, is fixed at will by means of corresponding pairs of slotted segments, G, G' , the segment, G, of each pair being quite near the center, and the segment, G' , being near the outer margin of the frame. The arm is connected with the outer segment by the means illustrated in Figs. 5, 7, and 8, in which f is a longitudinally slotted plate set in the lower face of the arm, and lying across the segment, G' . In the slot in the plate, f , slides freely a dovetailed plate, or head, f' , which is connected by means of a screw, s , with a slide, S, moving longitudinally in the segment. The arm may be moved laterally so as to move the slide, S, in the segment, or it may be moved longitudinally, the plate, f , being free to move upon the dovetailed head, f' . The slide, S, may be secured in any desired position by

means of set screws, H, adapted to draw the slide upward and press it firmly against the lower face of the slotted segment, and when the slide is thus secured, the arm can still move longitudinally but cannot swing laterally at the point where it crosses the segment, G'. Each of the arms is connected with the inner segment, G, by the means illustrated in Figs. 5 and 9, in which, f^2 is a longitudinally slotted plate set in the lower face of the arm, and f^3 is a small plate lying in the slot in the plate, f^2 , and sliding freely therein. The plate f^3 is connected by a screw, s' , with a dovetailed slide, S', lying beneath the segment, G, and sliding freely along it. The slide, S', may be fastened in any desired position on the segment by means of a set screw, H', set in one of its ends as shown in the drawings, and it is evident that when the slide is thus secured, the inner end of the arm can have no lateral movement, although the entire arm may still slide longitudinally. By means of the segments, G, G', and the parts co-operating therewith, the angular position of the arms, F, F, may thus be fixed at the will of the operator, and the longitudinal movement of the arms may be accomplished by means of the screw, E.

On each of the arms, F, is mounted a sliding clamping block adapted to impinge upon one point of the object to be secured in the clamp, and the construction of one of these blocks is fully shown in Figs. 3 and 4. In these figures, I is a vertical cylindrical shell so slotted horizontally as to slide freely upon the arm, F, the upper portion of the shell being an unbroken ring resting upon the upper surface of the arm, and the lower end of the shell being formed with lugs, i, i , engaging grooves in the opposite faces of the arm. The ring has on its inner margin an annular flange, i' , and within it lies a circular plate, I', formed with an annular flange, i^2 , which lies beneath the flange, i' , of the ring, the plate being thus held securely in the shell by means of the flange, i' , and the arm, F, upon which it rests. On the upper surface of the plate are formed two vertical posts, K, K, each having two inwardly turned faces at right angles to each other and so placed that each face of one of the lugs is at right angles to the corresponding face of the other lug. In conjunction with the posts, K, K, I use an angle-block, M, having three re-entrant right angles, two of which are adapted to engage the corresponding angles of the posts, K, K, while the third and intermediate angle is adapted to receive the corner of a frame or other article adapted to be clamped. The two posts are placed almost wholly on one half the circle of the plate, I', and the plate may be so turned upon the arm on which it rests as to present either pair of faces of the two posts and thus present more or less of the bearing surface of the plate and posts for the support of the frame or other article to be clamped, and by the use or the omission of the angle-block, M,

either a closed or an open corner may be presented to the article placed within the clamp.

Fig. 1 illustrates the various possible positions and uses of the plate, I', and posts, K, K, the clamps at the two upper corners of the figure being shown in two different positions without the angle-block, and those at the two lower corners being shown in two positions with the angle-block in place.

The dotted lines in Fig. 1 show the position of a square article such as a picture frame in operative position in the clamp, and it will be noticed that the two upper clamping blocks show the use of the open corner of the clamp, while the two lower clamping blocks illustrate the use of the closed corner.

The clamping blocks are held in place by means of set screws, L', passing through the shell, I, and impinging upon short clamping levers, L, as shown in Figs. 3 and 4. The lower end of each of the levers is pressed against the side face of the arm, F, while the upper end is formed with a groove, n , adapted to engage and be pressed against the flange, i^2 , of the plate, I'. At one point in its margin the plate, I', is formed with a notch, N, adapted to permit removal of the lever, L, and separation of the various parts of the clamping block. When all the parts are in the position shown in Fig. 4, if the arm, F, be withdrawn from the clamping block, it is evident that the upper end of the lever, L, may be swung inward into the notch, N, and may then be drawn downward and removed entirely from the block; and after the lever, L, is removed, the plate, I', with its posts, K, K, may be dropped downward and removed from the shell, I. The construction thus described is simple and is adapted to permit ready and convenient assembling of the parts.

Fig. 10 illustrates a modification of the construction of the guides, D, one of the jaws, D', of the dovetailed upper face of the guide being made in a separate piece from the remainder and being held in place by screws, s^2 , engaging the jaw and lying in transverse slots, n . By means of this construction the jaw, D', may evidently be moved laterally to vary its distance from the fixed jaw and thus compensate for wear of the parts.

I have found that it is sometimes desirable to increase the horizontal surface of the clamping blocks and for this purpose it is only necessary to place outside the shell, I, a suitable plate O of any desired size and form. Such a plate is shown in dotted lines in Fig. 3, the outer margin of the plate being indicated by the dotted lines and the inner margin being a circle fitting closely about the shell, I. The entire plate rests upon the arm and its upper surface is flush with the surface of the ring, I. The plate is also shown in section in Fig. 4 which is a vertical section through the line 4-4 of Fig. 3.

It is sometimes convenient in special work to have clamping blocks fitted exactly to the parts against which they are to be pressed.

For this purpose any special forms may be substituted for the angle-blocks, M, each form being, of course, provided with the angles adapted to engage the posts, K, K, and hold the angle block in place.

The frame of the clamp may if desired be provided with two or more lugs or ears, $a-a$, Fig. 2, adapted to be screwed to a bench or other support.

10 Having now described and explained my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a clamp, the combination with a suitable frame, two movable guides supported at the center of the frame and means substantially as shown and described for varying the distance between said guides, of a series of radiating arms having their inner ends pivoted in said guides and independently operated means for moving the inner and outer ends of said arms laterally, whereby the angular position of each of said arms may be varied at will; substantially as shown and described.

2. In a clamp, the combination with a suitable frame, two longitudinally slotted guides supported at the center of the frame and means substantially as shown and described for varying the distance of said guides from each other, of a series of radiating arms provided at their inner ends with pivots seated in the slots in said guides, two sets of slotted segments crossing said arms at different distances from the center, slides moving in said slotted segments, plates sliding in said arms and connected with said slides respectively, and means substantially as shown and described for fastening said slides in any desired positions in said segments, whereby said arms may be secured in any desired angular positions, and still be left free to move longitudinally; substantially as shown and described.

3. In a clamp, the combination with a suitable frame, two longitudinally slotted parallel guides supported at the center of the frame, and means substantially as shown and described for varying the space between said guides, of a series of radiating arms provided at their inner ends with pivots seated in the slots in said guides, inner slotted segments, G, and outer slotted segments, G', fastened to the frame, slides, S', S, moving in said segments, respectively, plates, f^3 , f' , moving in

longitudinal slots in the arms and pivoted to the slides, S', S, respectively, set screws adapted to secure the slides at any desired points in the segments and clamping blocks adjustably mounted on the arms and adapted to be brought into contact with different points upon an object to be clamped; substantially as shown and described.

4. The combination with the frame, the arms, F, F, F, F, and means substantially as shown and described for fixing the angular position of said arms and moving said arms longitudinally, of the clamping blocks adjustably mounted upon said arms and each made up of a shell, I, sliding upon the arm and provided with lugs engaging longitudinal grooves therein, a plate, I', resting upon the arm and flanged to prevent its upward movement, and posts, K, K, formed upon the plate, and each having two working faces at right angles to each other and at right angles to the corresponding faces of the other post, whereby the angle formed by either pair of faces of the two posts may be presented to the corner of an object to be held in the clamp.

5. The combination with the frame, the arms, F, F, F, F, and means substantially as shown and described for adjusting the arms, of the shells, I, mounted on the arms, the plates, I', secured and rotating in the shells and provided with the posts, K, K, and the angle-blocks, M, each formed with two angles adapted to engage the posts and with a third angle adapted to form the corner of the clamp, the angle-blocks being reversible upon the posts; substantially as shown and described.

6. The combination with the frame, the arms, and means for adjusting the arms, of the shells, I, sliding upon the arms, the plates, I', secured in the shells and formed with posts, K, K, and notches, N, the levers, L, lying within the shells and the set screws, L', impinging upon the levers and adapted to press the lower end of each lever against the arm and to press the upper end of the lever against the plate, I', and thereby to secure the shell firmly in any desired position upon the arm; substantially as shown and described.

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