

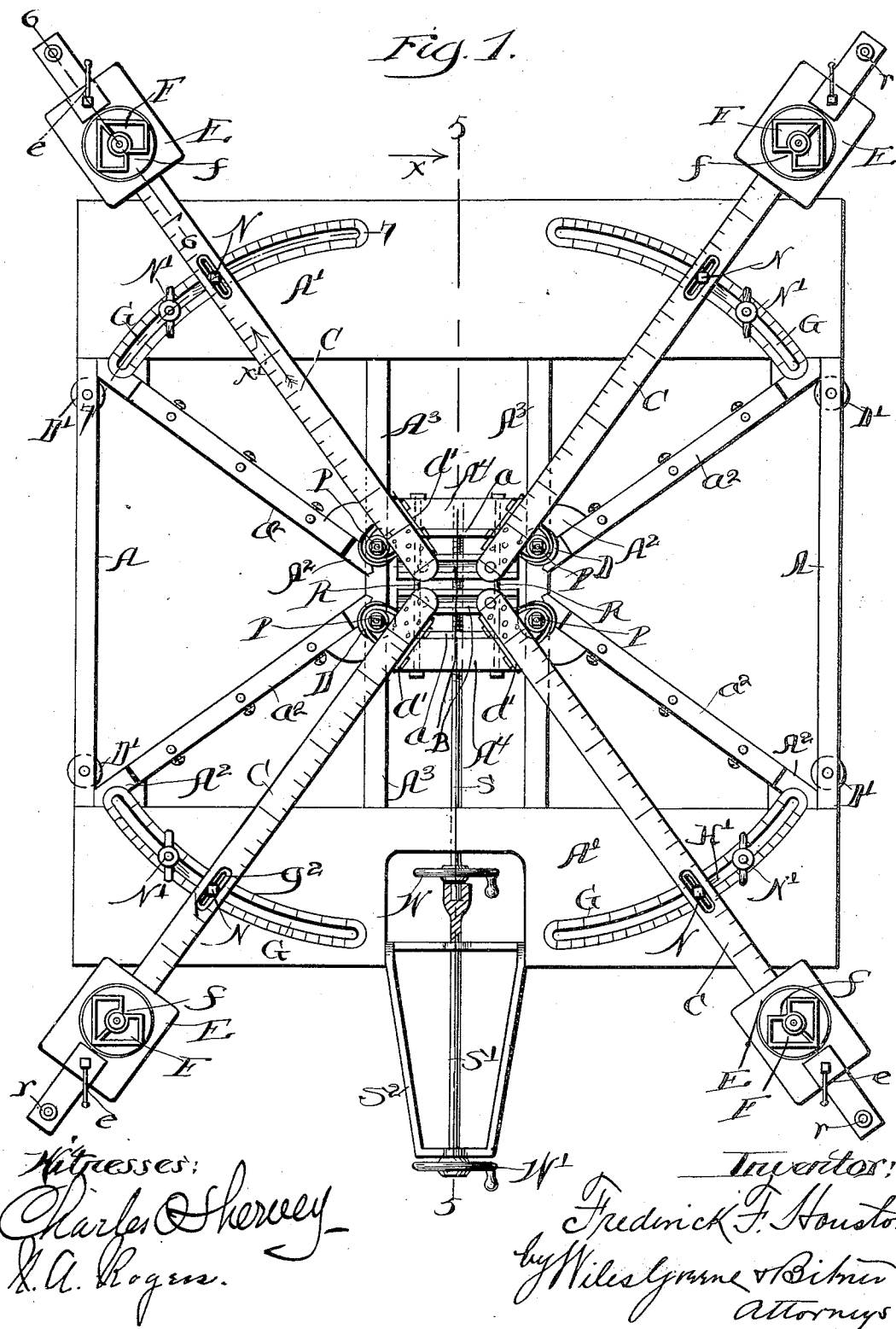
(No Model.)

3 Sheets—Sheet 1.

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

No. 511,844.

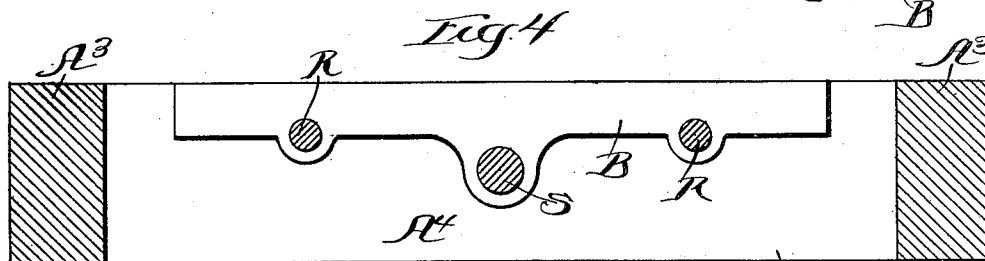
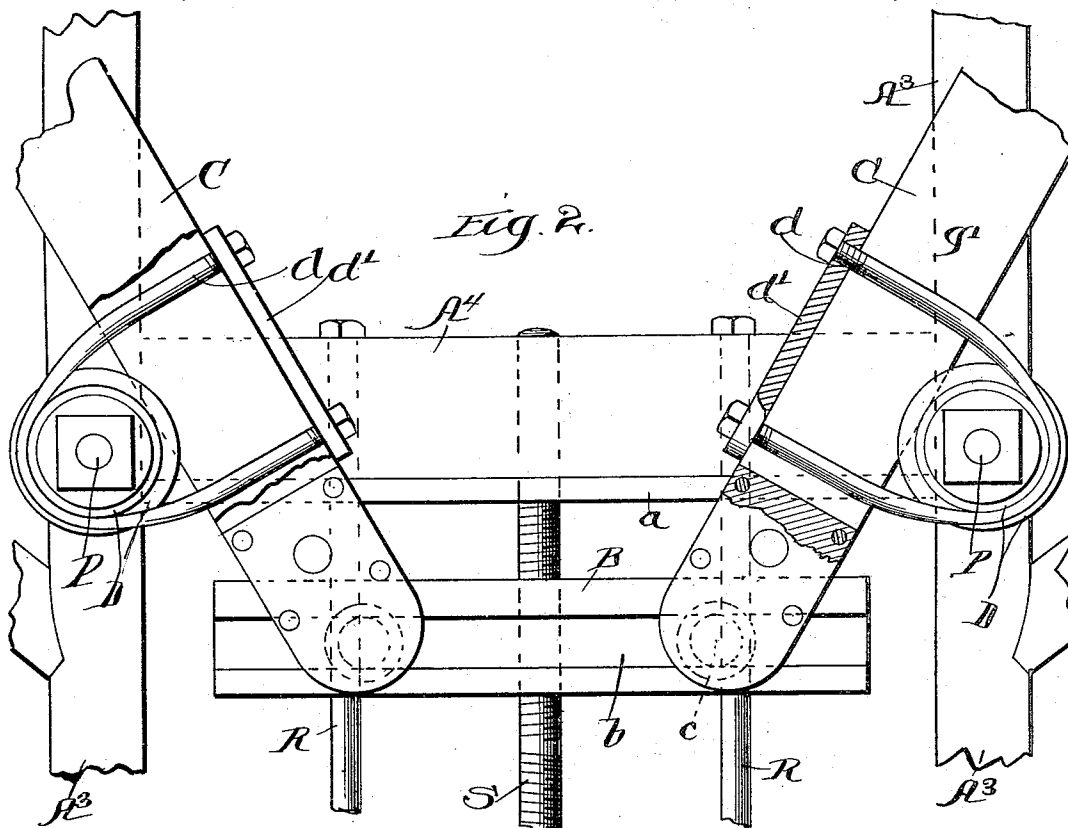
Patented Jan. 2, 1894.



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Witnesses:

Charles Shewey
H. A. Rogers.

Inventor:

Frederick F. Houston
by Miles Grimes Pitman
attorneys

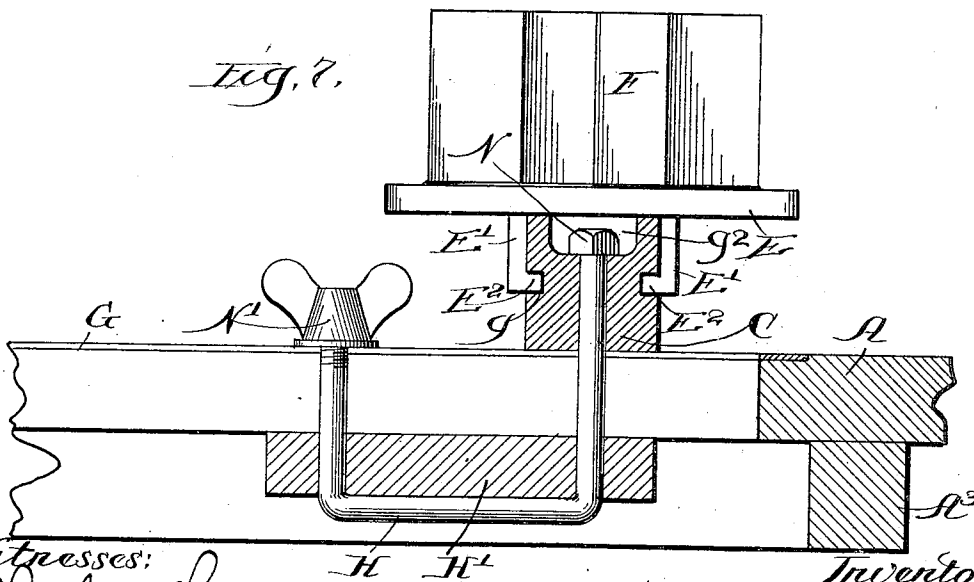
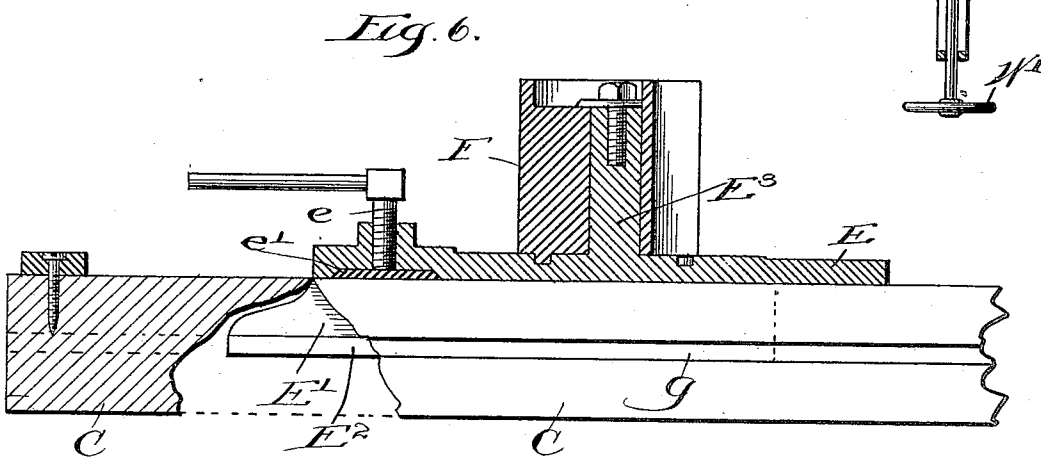
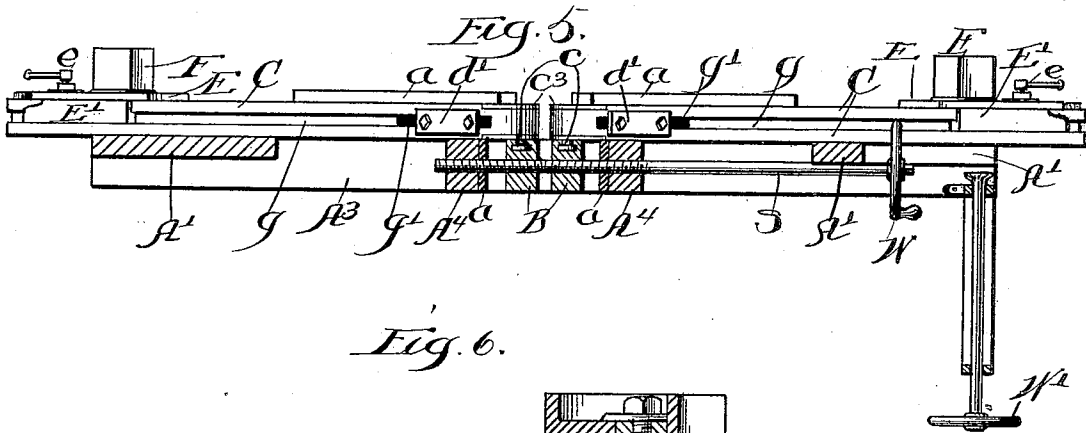
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3 Sheets—Sheet 3.

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Witnesses:
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H. A. Rogers.

Inventor:
Friedrick F. Houston
by Miles Lynde & Putner
attorneys

UNITED STATES PATENT OFFICE.

FREDERICK F. HOUSTON, OF CHICAGO, ILLINOIS.

CABINET-MAKER'S CLAMP.

SPECIFICATION forming part of Letters Patent No. 511,844, dated January 2, 1894.

Application filed August 19, 1892. Serial No. 443,499. (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 the class adapted to clamp together the different parts which make up a completed frame or other structure, and to hold them together in the process of gluing or otherwise permanently securing them.

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 complete clamp embodying my invention. Fig. 2 is an enlarged top plan showing the inner ends of the adjustable arms, certain parts being broken away to show construction. Fig. 3 is a side elevation of the inner end of one of said arms, the end of the arm being shown in central longitudinal vertical section. Fig. 4 is an elevation of one of the sliding bars B, whose movement draws the inner ends of the arms together. Fig. 5 is a view partly in elevation, and partly in vertical section, the section being through the line 5—5, Fig. 1, and the view being in the direction indicated by the arrow α , in said figure. Fig. 6 is a view partly in side elevation, and partly in longitudinal section of one of the adjustable arms C, and the clamping block adjustably mounted thereon, the section being through the line 6—6, Fig. 1. Fig. 7 is a vertical section through the curved line 7—7, Fig. 1, the view being in the direction indicated by the arrow α' , Fig. 1.

In the drawings, A, A are the side pieces and A', A' the end pieces of a preferably rectangular frame. A³, A³ are bars fastened to the end pieces A', A', and parallel to the side pieces A, A, and A², A² are diagonal strengthening braces joining the side pieces and the bars A³, A³.

Between the bars A³, A³ are transverse bars A⁴, A⁴, having their inner edges strengthened by iron faces a , a , Figs. 1 and 5, and between these transverse bars are two adjustable iron plates B, B, supported and sliding upon par-

allel rods R, R, set in the bars A⁴, A⁴, and having any desired cross-section.

A right and left hand screw S, Figs. 1, 2, 4, 55 and 5, is mounted in the frame at right angles to the bars A⁴, A⁴, and passes through the sliding plates B, B, in which, respectively, it engages with right and left hand screw threads. This screw is provided at its outer end with a hand-wheel W, or other suitable means for operating it, and the rotation of the screw in one direction must evidently draw the plates B, B, together, while its rotation in the opposite direction must force them apart.

Each of the plates B, has in its upper face a longitudinal dovetailed groove b , Fig. 3, and in each of those grooves slide two flanged washers or rollers c , attached to the lower faces of the inner ends respectively, of two adjustable arms C, C, whose function is hereinafter fully explained. The manner of attachment of each of the rollers c , to the corresponding arm C, is fully illustrated in Fig. 3, in which c' , is a stud lying within the roller c , and formed on a plate c^2 , attached to the lower face of the arm. A second plate c^3 , is attached to the upper face of the arm and a suitable bolt, or bolts, hold the plates c^2 , c^3 , in position. The lower plate c^2 , and its stud c' , are preferably of wrought or malleable iron, and the end of the stud is expanded and thus riveted in place. The inner ends of the four arms C, C, being thus adjustably secured in the plates B, B, it is evident that the adjustment of the plates must adjust the inner ends of the arms with reference to each other.

Each of the arms C, C, is formed with longitudinal grooves g , Figs. 3, 5, 6, and 7, in its side faces, and each of them is formed near its inner end with a transverse slot g' , Figs. 2 and 3, lying in the plane of the grooves g . In each of the slots g' , lies a horizontal clip d , Fig. 2, whose central portion encircles a roller D, lying at one edge of the arm C, while its ends are secured by means of a plate d' , lying at the opposite edge of the arm. Each of the rollers D, is secured to the corresponding bar A³, by means of a pivot P, passing through the roller and the bar, and each of the slots g' , is of such length as to permit limited adjustment of the arm with reference to the clip d , and roller D. By means of this con-

struction each of the arms C, swings about the pivot P, as a center, and, at the same time, has longitudinal adjustment with relation to it, so that all the arms are readily adjustable through the movement of the plates B, B, hereinbefore described. It is evident that the angular adjustment of the arms C, C, with reference to each other, must necessarily move the inner ends of the arms longitudinally upon the plates B, B, and it is for this reason that the studs c' , and rollers c , are so constructed and connected with the plates B, B, as to be movable longitudinally thereon.

On each of the adjustable arms C, C, is mounted a plate E, Figs. 1, 5, 6, and 7, provided with downwardly extending side flanges E' , E' , which clasp the edges of the arm and have at their lower margins inwardly extending lips E^2 , E^2 , which enter the grooves g , g , in the arm. This plate slides freely upon the arm, but may be secured in any desired position by means of a set screw e , and plate e' , Fig. 6, adapted to clamp the plate E, firmly to the arm.

Upon the upper surface of each of the plates E, is a vertical stud E^3 , Fig. 6, on which is pivoted a block F, Figs. 1, 5, and 6, having a re-entrant angle f , adapted to receive the corner of a frame or other rectangular device which it is desired to secure in the clamp. It is evident that since the four arms C, C, C, C, may be brought into any desired angular relation to each other, and the blocks F, F, may be adjusted at pleasure upon the arms, the blocks may be brought into position to embrace the angles of any quadrilateral figure, or to impinge upon the margin of any figure of irregular shape; and, furthermore, the adjustment of the plates B, B, is adapted to draw the arms inward with any desired degree of force and thus to complete the clamping of the body placed between the blocks F, F.

In order that the operation of the clamp may be perfect and certain, it is generally preferable to secure the arms C, C, in their desired angular relation to each other, and for this purpose the four quarters of the frame are provided with slotted segmental plates G, G, each of which is an arc of a circle having the corresponding pivot P as a center. In each of these slots slides freely a staple-shaped rod H, Fig. 7, whose legs pass upward through a retaining block H' , lying beneath the frame. The upper ends of the legs of the rod H, are screw-threaded and provided with nuts N, N', respectively, each of the nuts N, being in a longitudinal groove g^2 , in the upper face of the corresponding arm C, and each of the nuts N', being exposed to view and adapted to secure the arm in place at any desired point upon the slotted plate. That leg of the rod H, which passes upward through the arm C, lies in a vertical longitudinal slot therein, which permits longitudinal movement of the arm with reference to the other parts, and it is evident that when the parts are all in the relative po-

sitions shown in Fig. 7, the tightening of the nut N', must hold the arm securely against lateral or angular movement, but, at the same time, permits longitudinal movement of the arm for the purpose of clamping any device on which it is desired to operate.

In the use of this clamp I have found that it is sometimes necessary to provide supports placed between the arms C, C, and adapted to sustain the weight of the article to be clamped. For this purpose I have found it advisable to provide each of the diagonal braces A^2 , with supplemental bars a^2 , Fig. 1, each of said supplemental bars being provided with rods or fingers extending downward into the braces and held in place by a suitable set screw.

In some cases when very large articles are to be operated upon, it may be inconvenient to use the hand-wheel W, or other means for turning the screw S, as near the center of the machine as it is shown in the drawings. In such cases the screw may be turned by means of a supplemental device shown in Fig. 1, in which S' , is a rod hung in a frame S^2 , which is hinged to the main frame of the machine, the inner end of the rod being provided with a wrench adapted to engage the squared end of the screw S, and the outer end of the rod being provided with a hand-wheel W' , by means of which it may be turned. When out of use, the rod S' , and its frame S^2 , hang in a vertical position at the edge of the machine, and to bring them into use, it is only necessary to swing the frame upward to a horizontal position when the socket at the inner end of the rod engages the end of the screw and the turning of the rod S' , will then turn the screw.

In practice I have found it convenient to lay off upon the arms C, C, C, C, and the segmental plates G, G, G, G, equal divisions of length which may be inches or parts of inches, if desired, though this is not material since these divisions are intended merely to facilitate the symmetrical adjustments of the arms upon the segments and the equal adjustment of the blocks F, F, upon the arms.

The entire machine as I have constructed it is quite heavy and I have found it convenient to provide it with rollers D' , D' , set in the edge of the frame and adapted to serve as wheels for moving it from place to place when not in use. In order to move it in this way it is necessary to secure the arms C, C, C, C, in such positions that they do not project beyond the side edges of the frame.

In the use of the clamp I have found it necessary to provide the outer ends of the arms C, C, with stops of some sort adapted to prevent escape of the plates E, E, from the arms. For this purpose the cylindrical rubber blocks r , r , Fig. 1, are perhaps as good in form and material as any stops that can be devised.

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

1. The combination with the main frame having bars A^3 , A^3 , of the rollers D, D, D, D, pivoted to said bars, the arms C, attached to said rollers, but longitudinally adjustable with reference thereto, the plates B, B, connected with the inner ends of the arms, means substantially as shown and described for drawing said plates together and blocks F, F, adjustably mounted on said arms respectively; substantially as shown and described.

2. The combination with the main frame having the bars A^3 , A^3 , of the horizontally slotted arms C, C, the clips d , lying in the slots in said arms, and embracing the rollers D, D, pivots connecting said rollers with the bars A^3 , clamping blocks F, F, adjustably mounted on the arms and means for securing the arms in any desired angular relation; substantially as shown and described.

3. The combination with the main frame provided with the slotted plates G, G, of the swinging arms C, C, the bent rods H, lying in the plates G, and nuts N, N', engaging the

ends of said rods, each of the nuts N, being in a longitudinal groove in the upper face of the corresponding bar C, and each of the nuts N', being adapted to clamp the plate G, and thus to secure the arm in any desired angular position.

4. The combination with the main frame, the sliding plates B, B, supported thereby and the angularly adjustable arms C, C, having their inner ends pivoted to said plates, of the right and left hand screw S, engaging said plates and having its outer end adapted to receive a wrench, the frame S^3 , hinged to the frame of the machine, the rod S' , mounted in said hinged frame and provided with a socket adapted to engage the outer end of the screw S, and having at its outer end suitable means for its rotation; substantially as shown and described.

FREDERICK F. HOUSTON.

Witnesses:

ROBT. H. WILES,

A. I. H. EBBESEN.