

March 27, 1928.

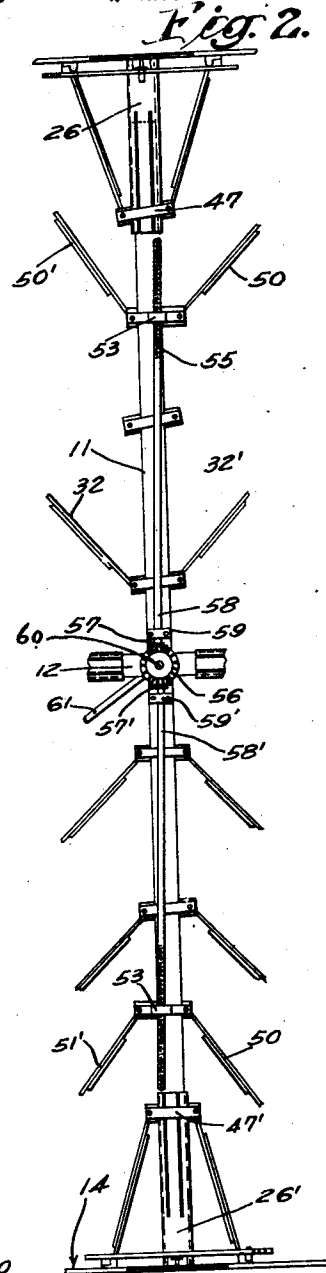
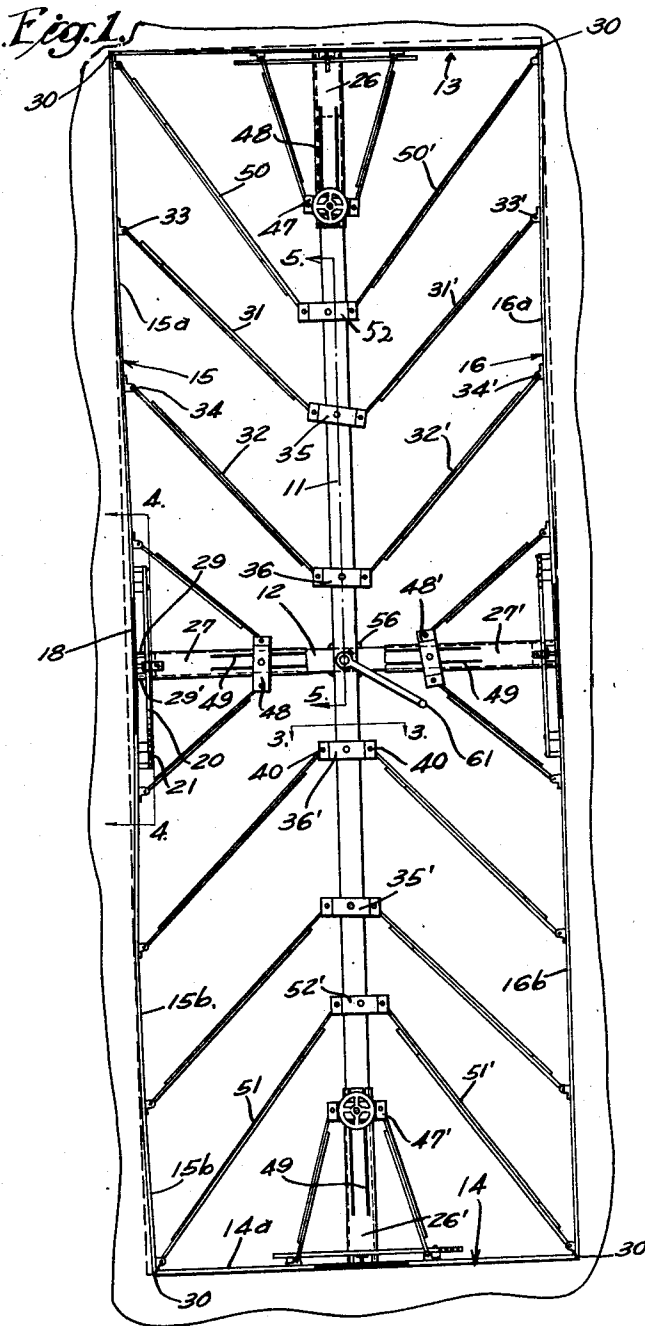
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1,664,076

TEMPLATE FOR DOORS AND WINDOWS

Filed April 12, 1926

2 Sheets-Sheet 1



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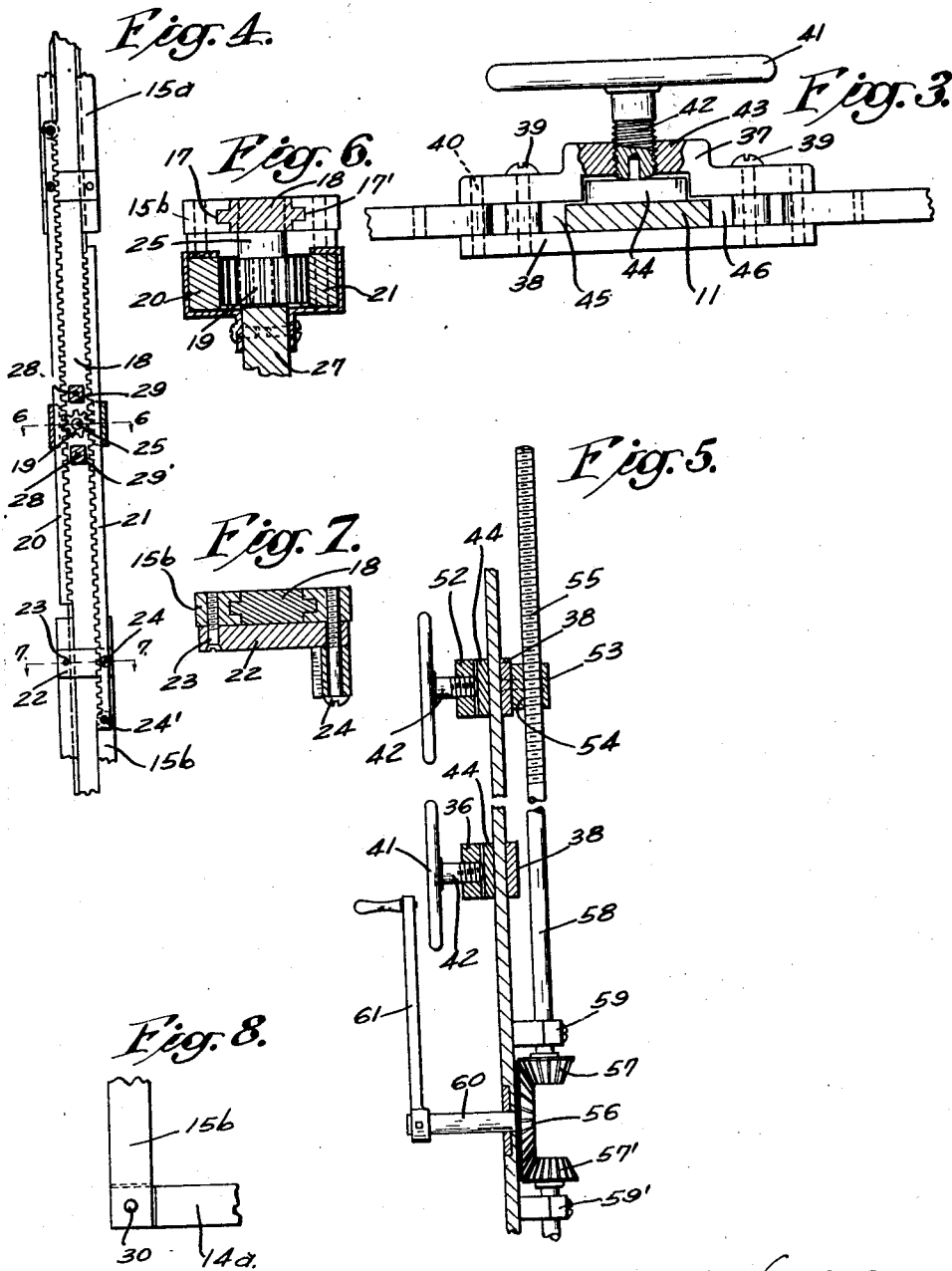
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## UNITED STATES PATENT OFFICE.

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## TEMPLATE FOR DOORS AND WINDOWS.

Application filed April 12, 1926. Serial No. 101,309.

My invention being referred to as a template for doors and windows, it may be understood to be an object of this invention to provide an expansible organization suitable to be inserted in a quadrilateral opening, to be expanded therein into contact with the jamb or frame-members defining said opening, and to have its parts, relatively movable in a manner hereinafter described, locked in their adjusted position,—the entire organization being then removed from the opening and employed in the marking and cutting of a door, window, or the like, to the exact size desired.

It being well known that the frames supplied by factories and by fabricators of sheet metal for use in door and window openings are not to be presumed reliably rectangular at the time of their delivery, and well known also that the incorporation of the same in buildings often tends to an accidental deformation thereof, so that the corners may not be rectangular and the sides may not be straight, it is an object of this invention to provide improved means for ascertaining the exact shape of an opening of the general character referred to; and preferred embodiments of my invention, comprising an inner frame whose parts are intended to be very rigidly and permanently connected, and an outer frame including flexible members which are pivoted together at the corners thereof and are provided with means for locking the same in various positions, may include means, such as a central crank or lever, for expanding the mentioned corners of said outer frame and pressing the same, either by horizontal expansion or by vertical expansion or by a combination of the two, into the corresponding angles of a door or window opening, or the like.

Other objects of my invention, including the use of bevel gears upon separated shafts in transmitting motion from a central crank or lever, to advance or retract slidable blocks, connected by diagonal members with the respective corners of said inner frame, and the use of means whereby corresponding sections of said outer frame are compelled to advance or contract equally with reference to the main members of said inner frame, and including also a provision of coaxial extensions upon the ends of inner frame members rigidly connected in the manner described, may be best appreciated

from the following description of a typical embodiment of my invention, taken in connection with the appended claims and the accompanying drawings, in which

Fig. 1 is an elevational view showing an embodiment of my invention as disposed in a quadrilateral opening whose sides and corners are not true,—deviations from a perfect rectangular form being suggested by the use of several dash lines; and clamp handles, which may be of the same form as those illustrated, being removed or broken away.

Fig. 2 is a similar view, with parts broken away, taken from the opposite direction.

Fig. 3 is an enlarged detail view, taken substantially as indicated by the line 3—3 of Fig. 1.

Fig. 4 is a detail view, taken on a different scale of enlargement, and as indicated by the line 4—4 of Fig. 1.

Fig. 5 is a detail view, taken substantially as indicated by the line 5—5 of Fig. 1.

Figs. 6 and 7 are respectively detail views, on a scale further enlarged, and taken substantially as indicated by the lines 6—6 and 7—7 of Fig. 4.

Fig. 8 is a detail view, on a scale comparable with Figs. 6 and 7, showing a preferred corner construction which permits pivotal movement between connected parts of an outer frame, as hereinafter described.

Referring to the specific details of that embodiment of my invention chosen for purposes of illustration, I may form an inner frame of two members, such as bars 11 and 12, rigidly connected, as by interfitting or welding in a central region of intersection,—associating with this rigid inner frame an outer and flexible frame, such as a frame comprising shorter or end sections 13 and 14 connected at their respective ends with side sections 15 and 16.

The respective end sections and side sections mentioned may each be formed of two or more members slidably connected in such manner as to permit of longitudinal expansion or contraction. For example, each of said sections may comprise a pair of oppositely disposed terminal members, as 15<sup>a</sup> and 15<sup>b</sup>, Fig. 4, centrally cut away and grooved, somewhat as shown at 17, 17', Fig. 6, to receive an intermediate member 18; and, in order to assure an equality of the relative movement between (say) the respective terminal members 15<sup>a</sup> and 15<sup>b</sup>, or their equivalent

lents, relatively to the intermediate member 18, or its equivalent, I may secure centrally of the latter a small pinion 19, adapted simultaneously to engage inwardly facing racks 20, 21, integral with or carried by the respective terminal members 15<sup>a</sup> and 15<sup>b</sup>,—means such as a reinforcing plate 22 and screws 23, 24, 24' being optionally employed to hold the mentioned parts in their indicated relationships.

The pinion 19, or its equivalent, may rotate upon a stub shaft 25, assumed to project inwardly from the intermediate member 18, or its equivalent; and, in order to steady the said member 18, holding the shaft 25, or its equivalent at all times coaxial with an inner frame member, such as the member 12, or its equivalent, I may provide the respective ends of the frame members 11 and 12 with longitudinally slidable extensions 26, 26' (on the longer inner frame member 11) and 27, 27' (on the shorter or horizontal inner frame member 12); and I may rigidly connect the outer ends of these extensions, or their equivalents, with the intermediate members of the respective outer frame sections by means such as screws 28, 28' (Fig. 4) extending through said intermediate members and into fingers 29, 29', on the end of the mentioned extensions,—the fingers 29, 29' serving incidentally as guards for the pinions 19.

Upon an insertion of an organization of the general character described within a door or opening or the like, it will be obvious that the outer frame elements may be so expanded as to thrust the ends of the terminal members 15<sup>a</sup> and 15<sup>b</sup>, and the ends of the associated sections 13, 14 and 16 into the angles of the opening to which a door or window, or the like, is to be fitted; but, in order to obtain a faithful outline of said opening, I consider it important to provide not only for the indicated equal expansion of the respective terminal members of the outer frame sections but to flexibly interconnect, or hinge together, the ends of said terminal members, substantially as shown in detail in Fig. 8, the outer or corner-forming ends of terminal members 15<sup>b</sup> and 14<sup>a</sup> being overlapped, halved away or otherwise interfitted or secured together, as by means of a transverse pin 30; and, in order to lock all parts of the flexible outer frame in any position to which they may in any way be forced, relatively to a rigid inner frame of the character described, or of any preferred character, I may interconnect the mentioned frames at various points by diagonal members, releasably securing the inner ends thereof to the inner frame by clamps of any preferred character.

For example, pivoting diagonal or brace elements 31, 31', 32 and 32' respectively to lugs or brackets 33, 33', 34, 34' upon outer frame elements 15<sup>a</sup> and 16<sup>a</sup> (corresponding

diagonal elements being similarly secured to lower terminal members 15<sup>b</sup> and 16<sup>b</sup>) I may pivot the inner ends of the mentioned pairs of diagonal elements respectively to floating blocks 35 and 36 (35' and 36') securing these blocks, or their equivalents, after the flexible frame elements have been pressed into contact with the door or window opening, by means such as clamps of the general character separately illustrated in Fig. 3. Each of these clamps may comprise an outer or front plate 37 and an inner or rear plate 38, secured together by means such as rivets, bolts or screws 39,—which may be identical with or distinct from pivots 40, by which the inner end of the mentioned diagonal elements are secured. Using this or an equivalent construction, a clamping pressure may be applied by means such as a lever or wheel or other handle 41, shown as rigidly connected with a threaded stem 42, entering a box 43 in the plate 37 and carrying a swiveled clamping head 44.

Using this or a similar construction, and providing sufficient play between the inner frame member 11, or its equivalent, and the mentioned floating blocks (as by leaving the large lateral clearances shown at 45 and 46, Fig. 3) said floating blocks being permitted not only to move longitudinally of the inner frame members but to assume various inclined positions relatively thereto (as suggested, with some exaggeration, in Figs. 1 and 2) when these floating blocks are locked in the positions which they naturally assume upon the spreading of the flexible outer frame into contact with the walls of the surrounding opening (similar inclined braces and blocks being provided in any desired numbers and positions and said blocks being mounted upon one or both of the intersecting frame members 11, 12) the entire organization may be removed from the opening and employed in the marking or cutting of a door, window, or the like; but I prefer, instead of relying upon direct manual pressure in forcing the terminal or corner members of the outer frame into the angles of an opening, to provide, for this purpose, mechanical means of the general character best illustrated in Figs. 1, 2 and 5.

Depending upon the size of my templates, the extensions 26, 26', 27 and 27' may respectively carry floating blocks 47, 47', 48 and 48', and, in order to permit an application of clamping pressure, through said extensions to the frames upon which the same are mounted, said extension may be provided with longitudinal kerfs 49; but, as to diagonal corner braces 50, 50', 51 and 51', extending approximately or directly toward the respective pivots 30, these braces may be connected with expanding or thrusting means comprising blocks (52, 52') having integral or attached projections 53, respectively

threaded, as at 54, for engagement by suitable screws 55. These screws, preferably on shafts of sufficient length and resilience to permit of a lateral shifting of the blocks 52, 52' in the general manner indicated in Figs. 1 and 2 (this shifting being assumed to result from defective angles at the upper right hand corner and lower left hand corner of the opening) may be operated by any suitable means. For example, they may be rotated by means such as a central bevel gear 56, engaging small cooperating bevel gears 57, 57' thereon, the inner ends of the shafts 58, 58' on which these gears are secured, being steadied by any suitable means, such as guides or bearings 59, 59',—shown in Fig. 2 as secured to the longer rigid frame member 11; and the central gear 56, or its equivalent, may be rotated by means such as a shaft 60, shown as extending through the intersection of the frame elements 11 and 12 and there provided with a wheel or crank 61 for manual manipulation.

Assuming all clamps to be "unlocked" and the crank 61 to remain stationary, manual pressure may be used to elongate the outer frame while incidentally narrowing the same, or vice versa; and, according to the direction or directions in which expansion of the outer frame elements is permitted, rotation of the crank 61, or its equivalent, may cause either lateral or vertical expansion of the outer frame elements; or, according to the effects of friction between relatively sliding parts, expansion in one direction may be simultaneous with or subsequent to expansion in the other direction; but, whether or not I employ the above described corner-thrusting means, providing for the use of transmission means from a central crank or other source of mechanical power, it should be understood that the forcing of the corners of my template into the angles of an opening is practically the first step following the insertion of the same into the opening, this step being followed by a manual application of such lateral and upward and downward pressures as may be required to bring the remaining portions of the flexible frame sections into contact at practically all points. All parts being then clamped rigidly in their established relationships, the template may be withdrawn and laid upon or against the door or window or other closure element which is to be correspondingly trimmed; and I may then either merely mark entirely around the edges of said template or I may clamp the same on a door, window, or the like, utilizing said template in the guidance of a cutting tool.

Although I have herein described a single complete embodiment of my invention, it should be understood that various features thereof are capable of independent use, and also that numerous modifications, additional

to those suggested herein, might be devised, by those skilled in the art to which this case relates, without involving the slightest departure from the spirit and scope of my invention, as the same is indicated above and in the following claims.

I claim as my invention:

1. In a template for use in quadrilateral openings: a substantially rigid interior frame; a flexible exterior frame mounted on said interior frame comprising parts pivotally connected to form corners; and means operatively connected to said interior frame for thrusting said corners into the angles of an opening.

2. In a template for use in quadrilateral openings: a substantially rigid interior frame comprising parts disposed substantially at right angles to one another; a flexible exterior frame mounted on said interior frame comprising parts pivotally connected to form corners; and means operatively connected to said interior frame for thrusting said corners into the angles of an opening.

3. In a template for use in quadrilateral openings: a substantially rigid interior frame; a flexible exterior frame mounted on said interior frame comprising parts pivotally connected to form corners; and means operatively connected to said interior frame for thrusting said corners into the angles of an opening,—said interior frame being in the form of bars intersecting at their respective centers.

4. In a template for use in quadrilateral openings: a substantially rigid interior frame; a flexible exterior frame mounted on said interior frame comprising parts pivotally connected to form corners; and means operatively connected to said interior frame for thrusting said corners into the angles of an opening,—said interior frame being in the form of bars intersecting at their respective centers and there carrying means for operating said thrusting means.

5. In a template for use in quadrilateral openings: a substantially rigid interior frame; a flexible exterior frame comprising parts pivotally connected to form corners; means operatively connected to said interior frame for thrusting said corners into the angles of an opening,—said interior frame being in the form of bars intersecting at their respective centers and respectively provided with extensions movable longitudinally thereof and brace members connecting said frames together.

6. In a template for use in quadrilateral openings: a substantially rigid interior frame; a flexible exterior frame comprising parts pivotally connected to form corners; means operatively connected to said interior frame for thrusting said corners into the angles of an opening; means on said interior frame for compelling oppositely extend-

ing parts of said outer frame, when expanded or contracted, to advance equally with reference to said inner frame and brace members connecting said frames together.

- 5 7. In a template for use in quadrilateral openings: a substantially rigid interior frame; a flexible exterior frame comprising parts pivotally connected to form corners; means operatively connected to said interior  
10 frame for thrusting said corners into the angles of an opening; means on said interior frame for compelling oppositely extending parts of said outer frame, when expanded or contracted, to advance equally with refer-  
15 ence to said inner frame, said last mentioned means comprising racks respectively secured to terminal members of outer frame sections, a pinion secured relatively to an intermediate member of said sections and brace mem-  
20 bers connecting said frames together.

8. In a template for use in quadrilateral openings: a substantially rigid interior frame; a flexible exterior frame comprising parts pivotally connected to form corners;  
25 means operatively connected to said interior

frame for thrusting said corners into the angles of an opening; and means, comprising diagonal members pivotally secured to floating blocks carrying clamping means on said interior frame, for holding all parts of said outer frame in predetermined relationships to said inner frame. 30

9. A template of the general character defined in claim 1 in which said flexible exterior frame comprises sections which include  
35 a plurality of terminal members and an intermediate member slidably connected therewith.

10. A template of the general character defined in claim 1 in which said thrusting  
40 means is capable of producing either lateral or longitudinal expansion, or a combination of longitudinal and lateral expansion, according to the direction or directions in which relative motion is permitted by the  
45 size and shape of the opening to be fitted.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 31st day of March, 1926.

RAYMOND L. HUMPHREY.