(No Model.) 2 Sheets—Sheet 1.

J. R. PAYSON, Jr.

DOOR HANGER.

No. 442,273. Patented Dec. 9, 1890.

Fig. 2.

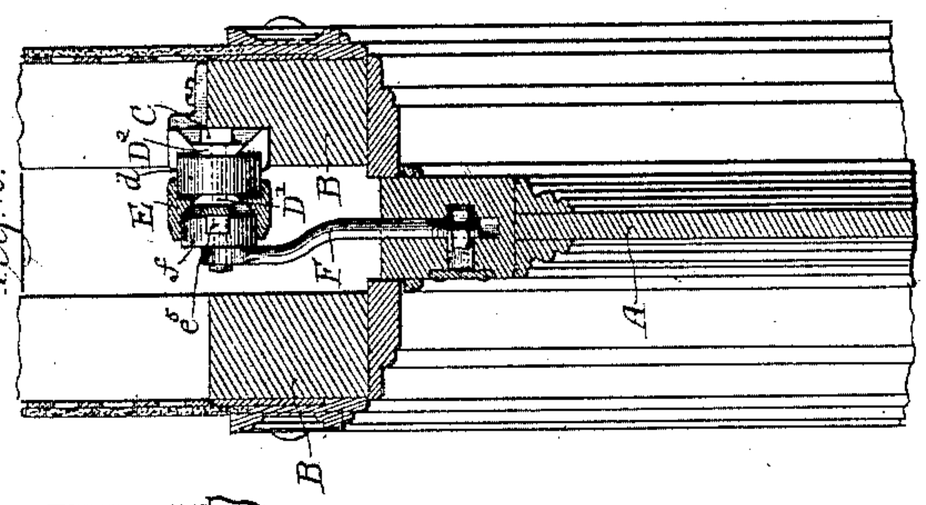


Fig. 4

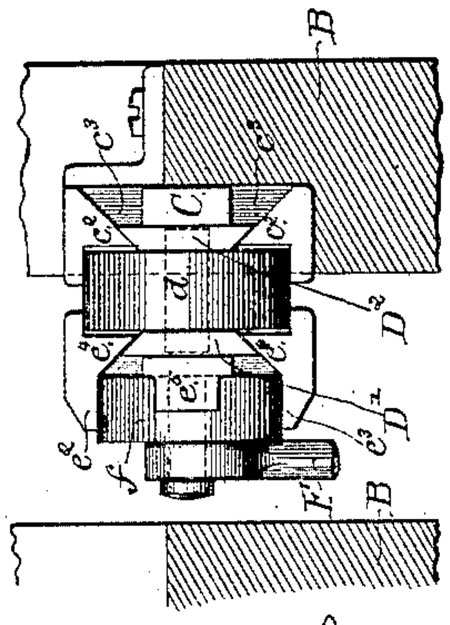


Fig. 5.

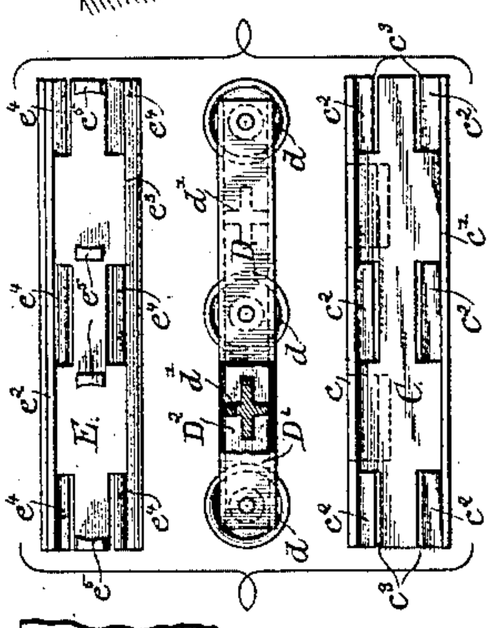


Fig. 1.

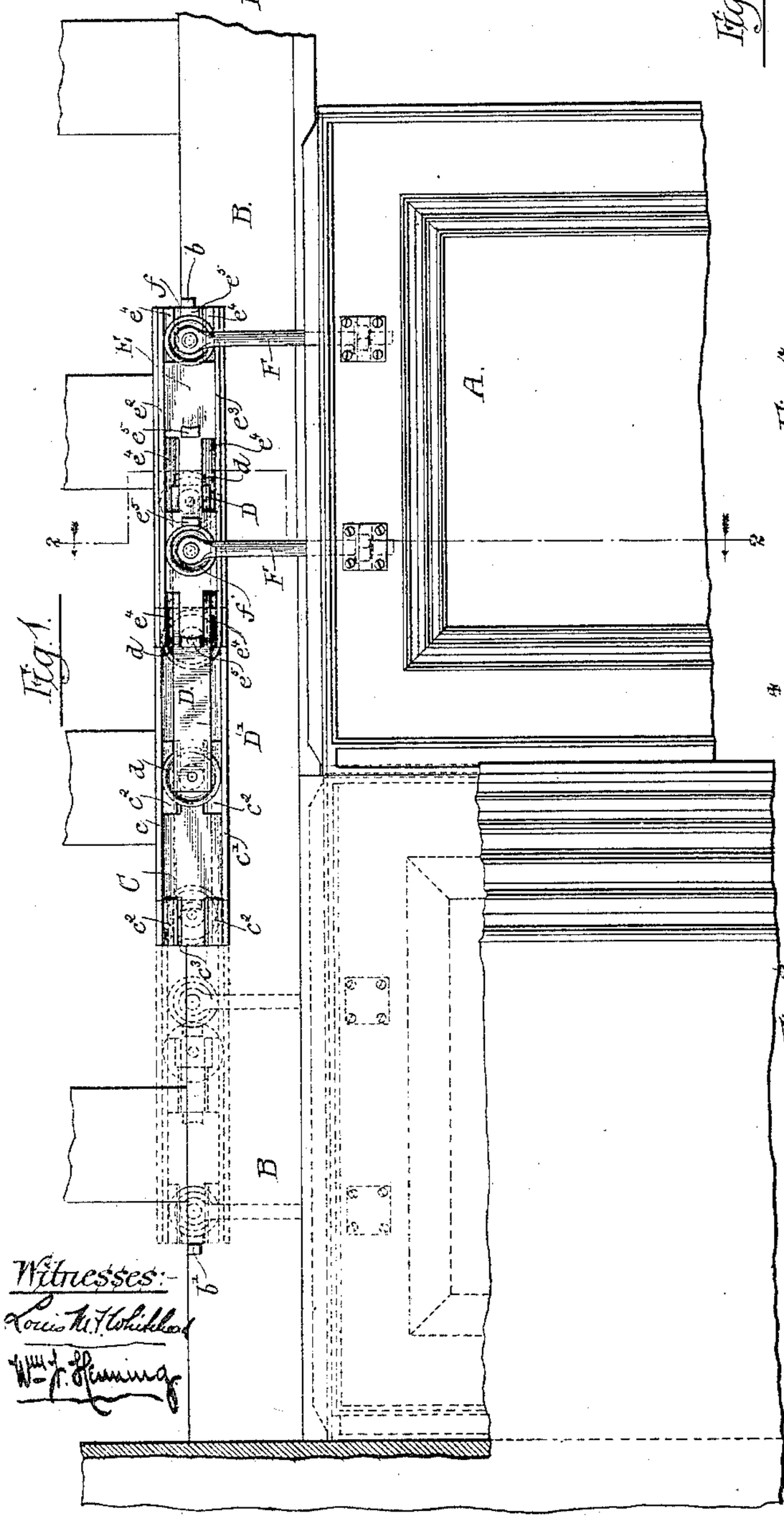
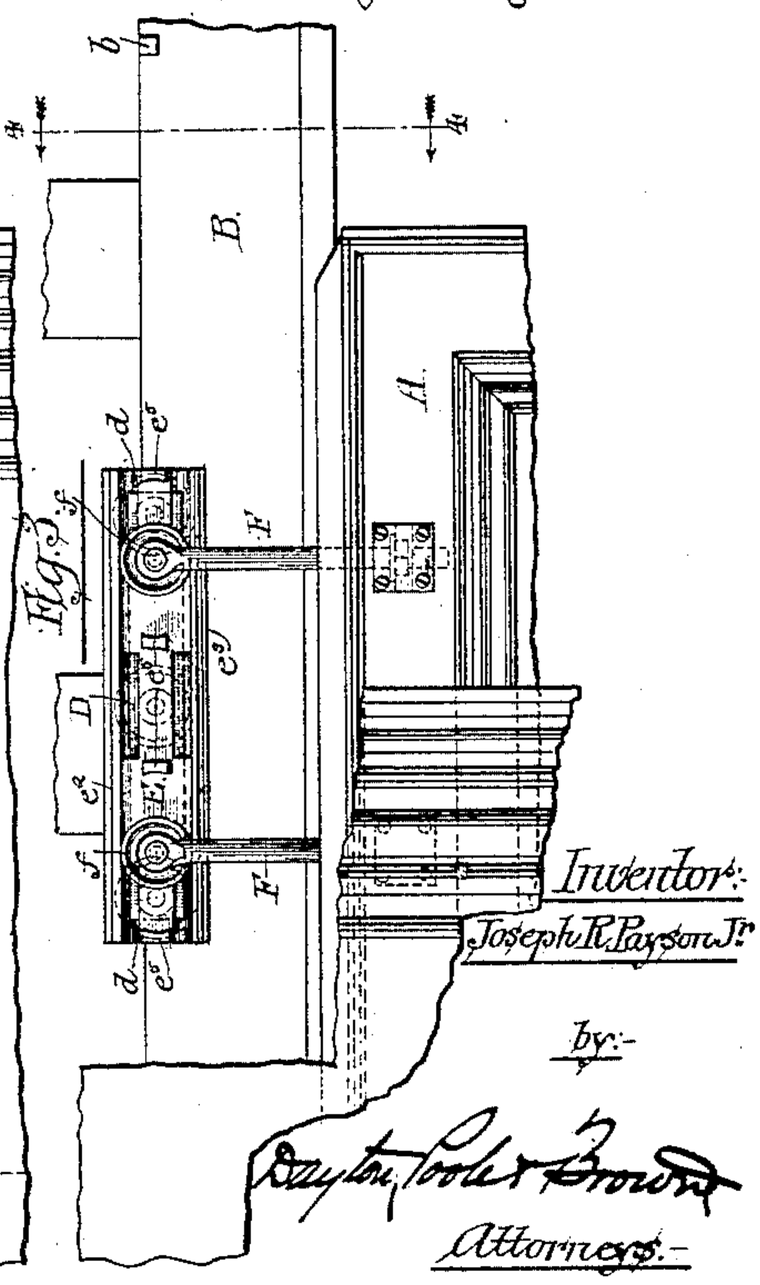


Fig. 3.



Witnesses:-
Louis M. Whitlock
Wm. F. Fleming

Inventor:-
Joseph R. Payson Jr.

by:-
Dayton, Cooley & Brown
Attorneys.-

(No Model.) 2 Sheets—Sheet 2.

J. R. PAYSON, Jr.

DOOR HANGER.

No. 442,273. Patented Dec. 9, 1890.

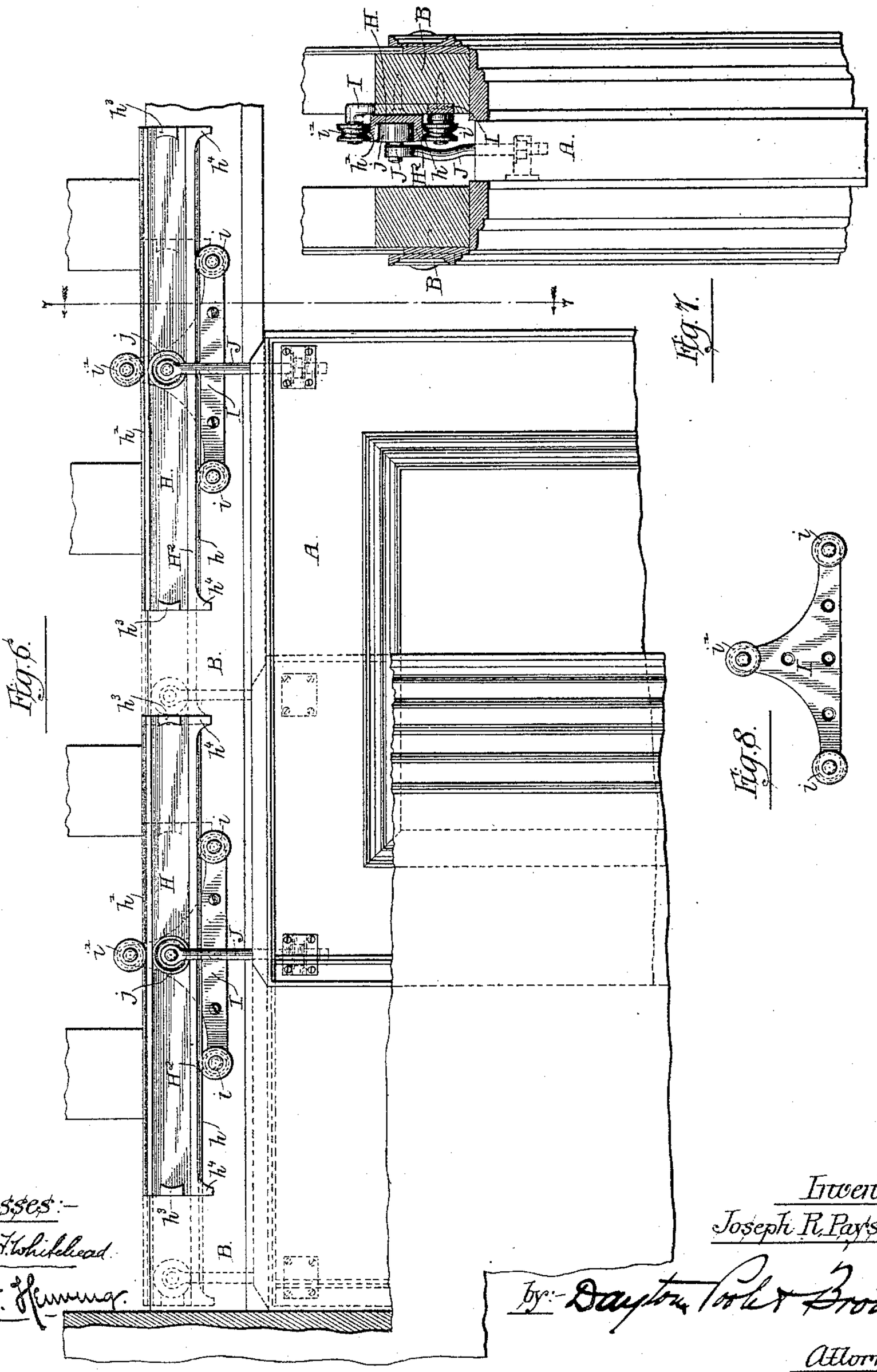


Fig. 6.

Fig. 7.

Fig. 8.

UNITED STATES PATENT OFFICE.

JOSEPH R. PAYSON, JR., OF CHICAGO, ILLINOIS.

DOOR-HANGER.

SPECIFICATION forming part of Letters Patent No. 442,273, dated December 9, 1890.

Application filed July 16, 1890. Serial No. 358,981. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH R. PAYSON, Jr., of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Sliding-Door Hangers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to devices concerned in the support of sliding doors, and more particularly to devices of this character wherein the employment of a stationary track extending the entire distance through which the door is moved is dispensed with.

My invention relates to door-hangers generally; but it also includes improvements in that particular form of hanger shown in a prior patent, No. 426,314, wherein I have shown a hanger which has a central point of attachment to the door-frame, and which moves or swings on either side of a vertical line passing through said point of attachment when the door is opened and closed.

My present invention embraces a hanger having the same features of construction in relation to the feature referred to, and as far as it relates to a hanger of this particular character it embraces a hanger which occupies a small vertical space above the door, so that it may be used in houses with low ceilings or where there is little space between the top of the door and the ceiling for the accommodation of the hanger.

In the accompanying drawings, illustrating my invention, Figure 1 is a view in side elevation of parts of a sliding door and the hanger thereof, showing the parts as they appear when the door is in its closed position, the wall being broken away to show the interior of the spaces or pockets above the door and within which the door is located when opened. Fig. 2 is a cross-sectional view taken upon line 2 2 of Fig. 1, and showing the upper part of the door and adjacent parts of the door-frame casing. Fig. 3 shows in side elevation the upper part of the door and hanger when the door is in mid-position or half-open. Fig. 4 is a large detail section taken upon line 4 4 of Fig. 3, showing the parts of the hanger in end elevation. Fig. 5 illustrates in side elevation, separated from each other, the three parts of the hanger shown in Fig. 4. Fig. 6 shows in side elevation the upper part of a door and a hanger of modified construction. Fig. 7 is a cross-sectional view of the same, taken upon line 7 7 of Fig. 6. Fig. 8 is a detail view of one of the parts shown in Figs. 6 and 7.

As shown in Figs. 1 to 5, A indicates the door, and B the door-frame. C is a stationary plate or bar attached to the frame and provided with horizontal upper and lower bearing rails or flanges *c c'*. D is a movable bar or frame carrying three rollers *d d d*, which rest between and engage the flanges of the bar C. E is a movable bar provided with upper and lower horizontal flanges *e e'*, which also engage with the rollers *d d d*. Said bar E is provided with external upper and lower bearing rails or flanges e^2 e^3, and to the upper part of the door are secured arms or brackets F F, having at their upper ends rollers *f f*, which are inserted between said rails e^2 e^3 and rest upon the lower rail e^3. In a hanger thus made the door is sustained by the engagement of the rollers *f f* with the movable bar E, which constitutes in effect a short movable track, and the said bar E is supported by engagement with the rails of the stationary bar C. The stationary bar C is secured to the frame B at the central part of the throw of the door, and as the door is opened or closed the latter passes from one side to the other of the center of said stationary bar, the rollers *f f* rolling on the bar E and said bar rolling on the rollers *d d d*, which latter roll or move bodily along upon said stationary bar C as the door is moved or shifted.

For the purpose of holding in place the bar E and the frame D in the movements of the said parts said frame is made with two longitudinal side bars or pieces D′ D^2, both of which are beveled at their edges, so as to give them a dovetailed form when seen in cross-section, and the bar D^2, which is adjacent to the bar C, is adapted to engage overhanging lugs or projections c^2 c^2 upon said plate C, as clearly shown in Fig. 5, while the bar D′ is

similarly engaged with lugs e^4 e^4 on the bar E. These lugs or projections may extend the entire length of the bars C and E, in which case they will form in effect dovetailed grooves engaging the said bars D′ D²; but, as a preferable construction and to avoid undue friction, three sets or pairs of lugs or projections are shown as employed on each of the bars, as clearly shown in Fig. 5, one pair of lugs being located at the middle of each bar and the two other pairs at opposite ends thereof. It will of course be understood that the side bars D′ D², composing the frame D, are engaged with the bars C and E in the manner described solely for the purpose of holding said parts together and the rollers *d d d* in position to engage the rails or bearing-flanges of the bars, and that none of the strain occasioned by the weight of the door comes upon the said side bars of the frame, but that such weight is taken entirely by the engagement of the rollers *d d d* with the bearing rails or flanges of the bars C and E, in the manner hereinbefore described. The frame D may be constructed in any manner found convenient or desirable; but, as herein shown, the side bars D′ D² of the said frame are rigidly connected by means of studs or connecting-pieces *d′ d′*, located between the rollers *d d*.

The bar E, provided on its outer face with lugs or projections e^5 e^5, is arranged in the path of the rollers *f f*, and forming stops to limit the movement of said rollers in either direction, each of the said rollers *f f* being arranged to move upon the bar E through a distance somewhat less than half the length of the bar. In opening and closing the door the rollers *f f* will usually first roll or move upon the bar E until arrested by striking one of the stops, after which the said bar E will be moved bodily upon or with the rollers *d d d*. The bar C may obviously be made of such length as to engage and sustain the several rollers *d d d* throughout the entire length of the movement of said rollers; but such construction would necessitate the use of a plate considerably longer than necessary, and for cheapness and simplicity of construction I preferably make the bar C, the frame D, and the bar E of the same length, and arrange the rollers *d d d* in such manner that the external or end rollers will move outwardly past the end of said bar C when the door is in its open and closed positions, all three of the rollers being engaged with the said plate C only when the door is at the central point of its movement. The location of the frame D, and the rollers *d d d* when the door is fully open and fully closed is clearly illustrated in the full and dotted lines of Fig. 1. When the door is closed, as clearly shown in Fig. 1, the middle roller *d* will stand near the end of the stationary bar C, while the end roller at the right-hand end of the bar will be free from the said plate and that at the left-hand end of the bar will stand at the middle of the plate. In this position of the parts the middle roller will of course press downwardly upon the bearing-rail *c′*, while the end roller at the left-hand end of the frame will bear upwardly against the upper bearing-rail *c*. Similarly the movable bar E will be sustained by engagement with the middle roller and the right-hand roller only, the upper rail *e* of said bar bearing downwardly against the end roller at the right hand, while the lower rail *e′* bears upwardly against the intermediate roller. It follows that the said end rollers bear upwardly against the bearing-rails *c* and *e* of the stationary and movable bars at all times except when the door is at the middle part of its throw or centrally beneath the stationary bar C, as seen in Fig. 3, at which time all three of the rollers rest and bear upon the lower bearing-rails *c′* and equally sustain the movable bar E. When the door is in its central position, as seen in Fig. 3, the rollers *f f* of course stand centrally between the stops e^5 e^5.

In order to enable the lugs or projections to be conveniently cast upon the bar C said bar is herein shown as provided in its rear or back wall with openings c^3 c^3, arranged opposite said projections and extending the entire length of the same, as clearly shown in Fig. 5, so that the said projections may be made to overhang, or with undercut rear surfaces without the use of sand-cores in casting, the presence of said openings c^3 obviously enabling the patterns for said bars to be drawn from the sand in molding in the same manner as an ordinary plain casting.

Stops *b b′* are shown as attached to the door-frame B in position to arrest the movement of the bar E when the door reaches its opened and closed positions. Stops for this purpose may, however, be located or arranged otherwise than as shown.

As illustrated in Figs. 6, 7, and 8, the door is provided with two separate supports or hangers, which are somewhat different in form from that shown in the other figures, while embracing the same general features of construction. In this instance H H are horizontally-arranged bars, which are supported by and adapted to move longitudinally between bearing-rolllers *i i i′*, mounted upon the door-frame B above and below the said bars, two of the bearing-rollers *i i* being arranged beneath the bar and the third roller *i′* above the same. Said rollers are herein shown as mounted on a single plate or casting I, as clearly seen in Fig. 8. To hold the bars H H in engagement with the rollers, the latter are preferably grooved and the bar provided with tongues or flanges *h h′* at its bottom and top edges to engage the grooves of the rollers.

J J are arms or brackets attached to the upper edge of the door near the front and rear margins thereof and provided at their upper ends with rollers *j j*, which rest upon a horizontal flange or bearing-rail H² of the bar H. For compactness of construction the said bars H are preferably recessed on their outer faces, so as to form grooves sufficiently deep

to receive the said rollers *j j*, the bottom walls of the groove forming the said bearing-rails II² II². Said bars II II are provided at their opposite ends with lugs or projections *h*³ *h*³, forming stops to limit the movement of the rollers *j j*, and also their lower edges with stops *h*⁴ *h*⁴, adapted to engage the rollers *i i*, so as to limit the longitudinal movement of the bars. These parts are so arranged that when the door is midway of its movement the bars II II stand centrally with reference to the rollers *i i* and the rollers *j j* are at the center of the bar. This position of the parts is illustrated in Fig. 6. In opening the door, as shown in dotted lines in said Fig. 6, the rollers *j j* will be brought against the stops *h*³ *h*³, and said bars will then be shifted bodily until the stops at the end of the same have engaged the rollers *i*, this position of the parts being shown in dotted lines in said Fig. 6.

It will of course be seen that when the roller reaches a point outside of a vertical line passing through the axis of either of the rollers *i i* the weight of the door will tend to lift one end of each bar H, so that the bar is held in horizontal position at such time by its upward bearing against the upper roller *i'*.

It is obvious that both of the forms of device shown embrace generally the same features—to wit, horizontally-arranged sliding parts or bars, which form in effect an extensible arm for supporting the door, and which also embrace a track for the rollers on the door, the principal difference being that in the device shown in Fig. 1 an intermediate part—to wit, the frame D—is interposed between the said sliding bar E and the stationary bar or guide upon the frame. It will of course be seen that the rollers *d d d* upon said frame D are merely for the purpose of affording an anti-friction bearing between the parts, and that said frame D, together with the bar, constitutes in effect a telescopic or extensible arm for supporting the door. Similarly the rollers *i i i'* (shown in Fig. 6) are for the purpose of preventing friction in the movements of the bar H, and said rollers form a guide for the bar, which latter constitutes a telescopic or extensible arm for sustaining the door during the movement of the latter. In both of the instances illustrated the extensible arm formed by the sliding or telescopic parts shown is adapted to be moved on either side of a central stationary support which is attached to the door-frame at a point midway of the movement of the door. This construction has the obvious advantage of requiring a relatively short extension of the arm in either direction in order to support the door throughout its entire movement, so that the requisite strength in the arm may be obtained without making the parts large or heavy, and the parts are prevented from yielding downwardly or sagging under the weight of the door, as is liable to occur when the arm is extended from one side of the door the entire width of the same. Under some circumstances—as, for instance, in the case of light or narrow doors, or those having a relatively short throw or movement—the arm may be arranged for extension in one direction only from a point of attachment located at one side of the door-casing, and, inasmuch as a telescopic or extensible arm composed of sliding parts provided with anti-friction devices is novel with me, such arm is embraced in my invention whether the same be arranged in the particular manner herein illustrated or otherwise.

By reason of the advantages gained by attaching an extensible or telescopic arm to a door-frame at a central point this construction is herein also claimed as a part of my invention, and in this respect the present invention is an improvement upon that set forth in said prior patent, in which an extensible arm is similarly attached at a central point to the door-frame, the telescopic arm herein shown being adapted for use in the case of house-ceilings and elsewhere where the device shown in said prior patent could not be applied.

One part of the extensible or telescopic arm is herein shown as made to form a movable track upon which rollers attached to the door are arranged to rest and move. This construction enables a required movement of the door to be obtained with a less movement than would otherwise be necessary in the extensible arm itself; but, inasmuch as under other circumstances the door may be suspended directly from the extensible arm without the use of any track or roller on the door, I do not wish to be limited to a construction embracing such track.

I claim as my invention—

1. A sliding-door hanger consisting of an extensible or telescopic arm attached to the door-frame and supporting the door, said arm consisting of sliding or telescopic sections provided with rollers or other anti-friction devices, substantially as described.

2. A sliding-door hanger consisting of an extensible arm formed of sliding or telescopic sections, said arm being fixed at a central point to the door-frame and having its free end adapted to move upon either side of a vertical line passing through its point of attachment to the door-frame, substantially as described.

3. A sliding-door hanger consisting of an extensible arm fixed at one point to the door-frame and supporting the door, said extensible arm consisting of sliding or telescopic sections, one of which forms a track, and rollers attached to the door and resting on said track, substantially as described.

4. A sliding-door hanger consisting of a plurality of rollers mounted on the door-frame, a horizontally-movable bar engaged with said rollers, and a roller or rollers on the door resting upon the said bar, substantially as described.

5. A sliding-door hanger comprising a plu-

rality of rollers upon the door-frame, a horizontally-movable bar engaged with said rollers, said bar and the rollers being provided with interfitting grooves and flanges for holding said parts in engagement, and a roller or rollers upon the door resting upon said bar, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

JOSEPH R. PAYSON, JR.

Witnesses:

TAYLOR E. BROWN,

GEORGE W. HIGGINS, Jr.