

June 27, 1950

C. D. McDONALD

2,512,804

DOOR LOCKING LATCH MECHANISM

Filed Dec. 13, 1946

3 Sheets-Sheet 1

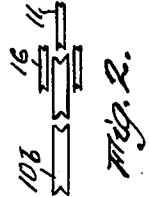
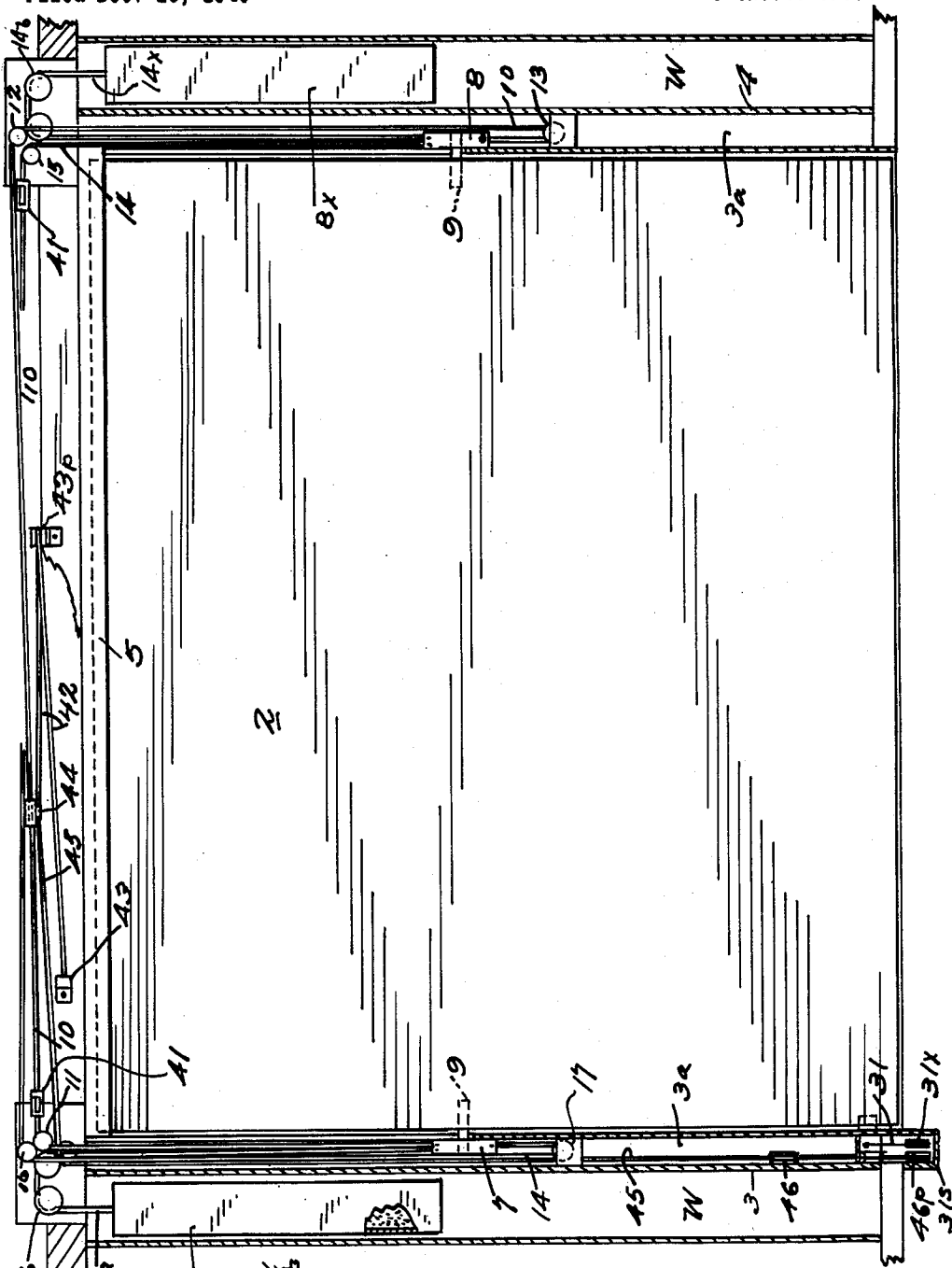


Fig. 1. Chas. D. McDonald,
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June 27, 1950

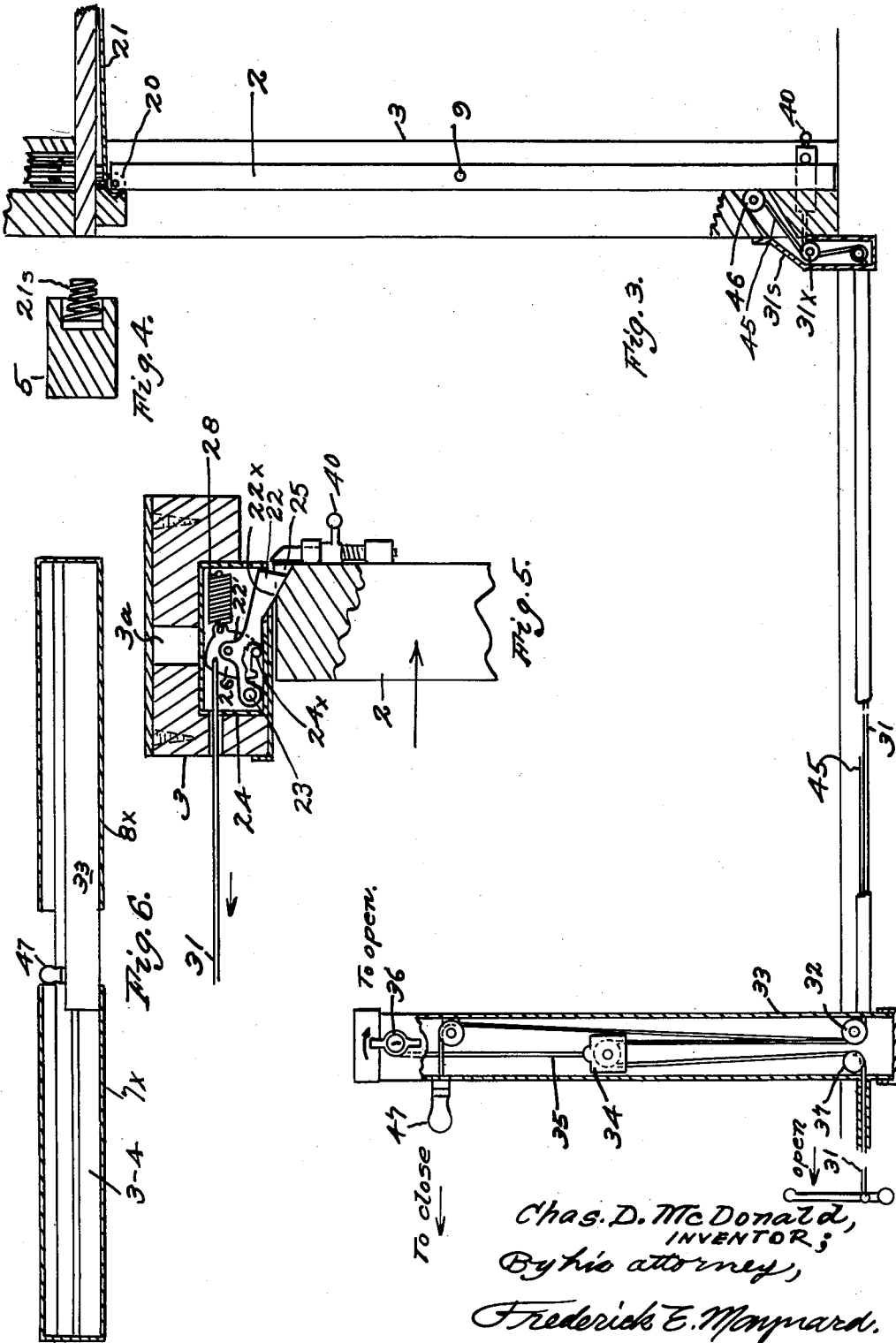
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3 Sheets-Sheet 2



Chas. D. McDonald,
 INVENTOR;
 By his attorney,
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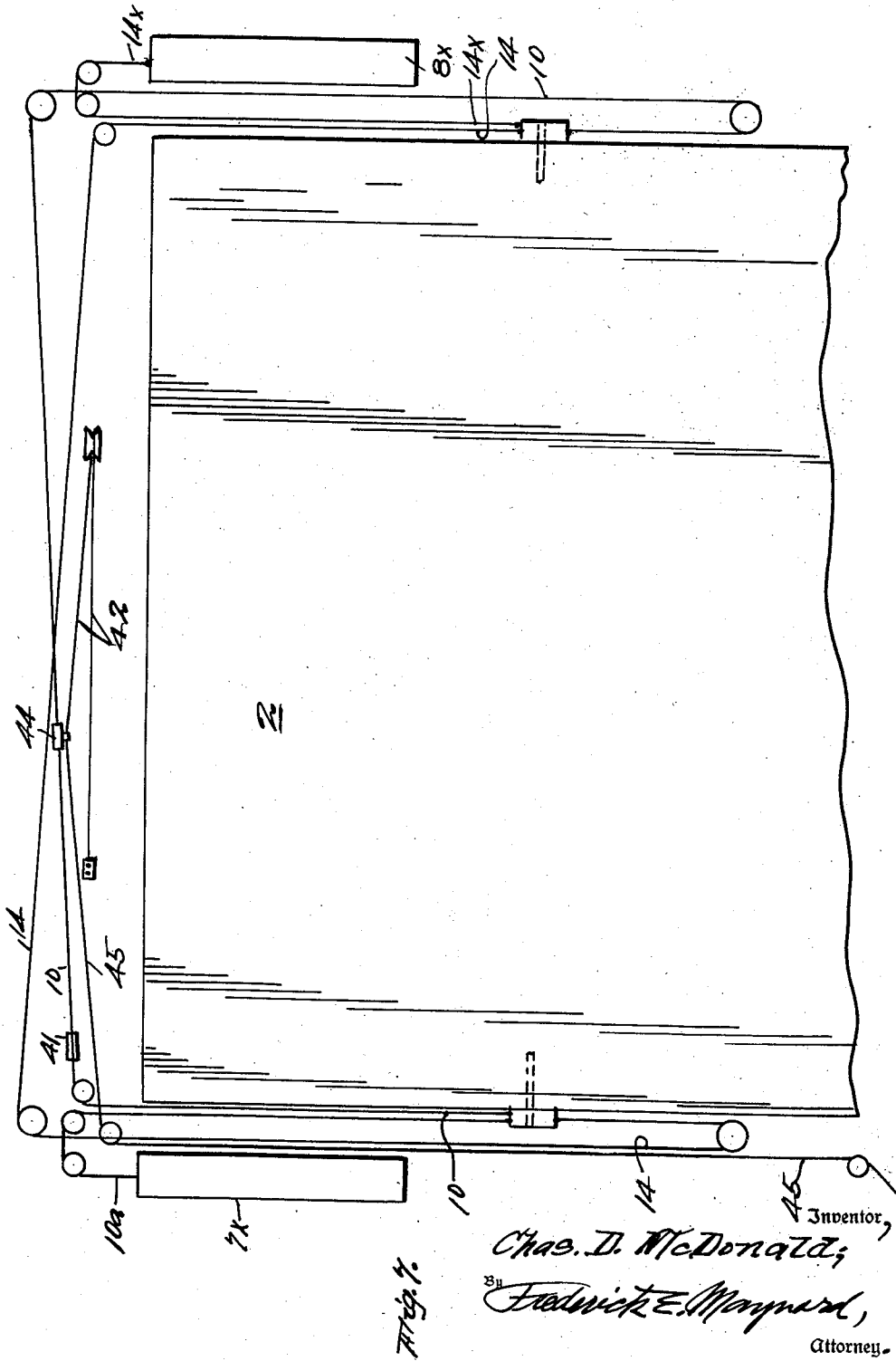
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DOOR LOCKING LATCH MECHANISM

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3 Sheets-Sheet 3



UNITED STATES PATENT OFFICE

2,512,804

DOOR LOCKING LATCH MECHANISM

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3 Claims. (Cl. 70—146)

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This invention relates to a latch mechanism for an automatic door of the type shown in co-pending applications Ser. No. 653,248, filed March 9, 1946, and Ser. N. 686,971, filed July 29, 1946.

It is an object of this invention to provide a simple, reliable, substantial, practical and efficient door locking latch mechanism whereby to normally prevent opening of the respective door, and which mechanism includes a locking element manually retractable from locking position by a remotely located control means.

The invention resides in novel features of advance in this kind of doors as set forth in the ensuing disclosure and having, with the above, additional objects and advantages, and whose construction, combination and details of means will be made manifest in the following description of the herewith illustrative embodiment; it being understood that modifications, variations and adaptations may be resorted to within the scope, spirit and principles of the invention as it is claimed in conclusion hereof.

Figure 1 is a sectional, front elevation of the doorway with the door in normal, vertical closed position; the control cables being in diagram arrangement for clarity, and Figure 2, sheet 1, is a plan diagram of the cable pulley arrangement of the left door jamb. Figure 3, sheet 2, is a vertical section of details of the structure; the door being in closed position. Figure 4 is a detail section of the booster for the top of the door. Figure 5 is a sectional plan of the door lock device. Figure 6 is a sectional view showing the knocked down package assembly of the apparatus. Fig. 7 is a diagram of the control cable system for the door.

One embodiment of the invention includes a garage door 2 mounted for vertical and tilting movement between right and left jambs 4 and 3 having a connecting header 5 along which the top of the vertical, closed door stops. Each jamb has a vertical guide slot as 3a in Fig. 5, and outwardly of each jamb the door frame has a weight well W.

Mounted in each vertical guide slot 3s is a relative, vertical slide 7 and 8 which pivotally receive relative, coaxial trunnions 9—9 rigidly fixed in the vertical edges of the door; the axis of the trunnions being somewhat above the horizontal center line of the door so that the lower part of the door (below the said axis) slightly overweighs the part above the axis thereby causing the bottom end of the door to constantly tend to tip down on the supporting trunnions. However this unbalance feature may be had in any other suitable manner to the same effect.

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From slide 7 a cable 10, or the equivalent, rises to a pulley 11 and thence along the header 5 to a pulley 12 above jamb 4 and down in this jamb to a fixed axis pulley 13 and thence up and connecting to the bottom of the slide 8. It will be seen that when the slides rise in synchronization the cable 10 from slide 7 pays out to the pulley 13 so that the related end of the cable 10 goes up with the slide 8.

In the same manner of hook-up a cable 14 pays out from the slide 8 to a header pulley 15 and thence to a distal pulley 16 at the top of jamb 3 and then down in a bight around a pulley 17 and up to the bottom of the slide 7. This ties the slides for synchronous actions; going up or going down as the door trunnions rise or descend.

To motivate the door automatically in upward movement by way of the trunnion slides 7 and 8 a motor device is hitched to the slides in a direct manner to concurrently apply a substantially equal lifting moment on the slides. The costless and springless force of gravity is here employed to lift the door to horizontal, overhead position. Directly hitched to the slide 7 is a power cable 10a which rises to a tandem pair of guide pulleys 10b at jamb 3 and directly connected to a suitable weight consisting of a sand loaded can 1x vertically movable in the well W at stile jamb 3. In a like manner a cable 14x in the well W at jamb 4 passes over a head pulley 14b from its connection with the slide 8 to the related power weight 8x. The combined weight of the equal weights 1x and 8x is somewhat more than that of the door 2 and its slides 7 and 8 and other attachments, so that if the door is free to rise the force of gravity on the weights will act equally on the slide cables 10a and 14a and lift the door to overhead position.

The constant effort of the weights presses a roller 20, mounted in the top of the door, up against a fixed track 21 extending inward from the header and reacting to cause the top edge of the door to take a horizontal path to full open position of the door. So that this back travel may have a fast initial motion there is provided in the header 5, Fig. 4, a booster spring 21s exerting a constant back push on the top of the door to tilt it on the trunnions.

The bottom of the door is positively locked by a device, Fig. 5, including a strong latch lever 22, on a fixed pivot 23 in a box 24 set in the foot end of the left jamb 3, and having an outwardly pitched face 22x on its swinging end which latter moves into a notch 25 in the near edge of the door. This latch is controlled by a remote con-

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trol means as will be explained. The lever has forward of its pivot 23, a laterally extending finger 22' on which is pivoted a dog 26 pulled by a spring 28 to force the latch lever 22 to effective position, Fig. 5 as the dog is stopped by a lug 24x of the box while the outer end of the dog rests against the near wall of the box and therefore prevents the latch from being pushed back into the box. The outer end of the dog is attached to a small cable 31 which runs to a set of guide pulleys 31x in a shell 31s and thence to a pulley 32 in the foot of a control post 33 standing, for example at the side of a driveway leading to the door 2.

In this post is operative a travelling pulley 34 hung by a pulling cable 35 attached to the stem of a key-controlled lock 36. The latch cable 31 takes a bight around the pulley 34 and thence to a foot pulley 37 whence it extends to any suitable or desired control point as in the dwelling, or office or other station pertinent to the garage door. By pulling on the cable 31 either at the remote station or by turning the stem of the lock 36—which will operate to lift the travelling pulley—the dog 26 will be retracted to clear itself from the box wall and to pull in the protruding end of the latch. The thus freed door will at once start to rise.

On the inside, lower portion of the door is a manually operable spring-bolt 40 normally engaging the latch lever 22 to keep the door locked until the latch is pulled clear as above stated.

A feature of this invention is a simple and low-cost means for setting the trim—the operating position—of the door in the jams. Each of the two cables 10 and 14 has a turnbuckle 41 so located that as the door is lifted the turnbuckles move inward from the tops of the jams 3 and 4. Since the coordinating cables 10 and 14 are dead-hitched to the slides 7 and 8, once the cables are trimmed by their turnbuckles no further attention is needed.

Another distinctive feature of the invention is a means by which the open door can be readily pulled to vertical or closed position, say by a person backing a car out of the garage (above mentioned). With this objective, a substantial elastic cable 42 has one end fixed at 43 to a part of the head frame and has a bight around a guide pulley 43p to a traveller 44 loosely mounted on the header stretch of the cable 10. The traveller is located to the right of the turnbuckle of this cable, Fig. 1, and the traveller is attached to the near end of a tug cable 45 running down at jamb 3 to a pulley 46 thence out into the shell 31s and past guide pulleys 46p therein and connecting

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to a pull knob 47 at the top of the post. When the door is open, overhead position (with the trunnions near the tops of the side jams) the turnbuckle 41 of the cable 10 has shifted in toward the right and moved close to the traveller 44 which stands retracted by its elastic cable 42 to a degree limited by the post knob 47. When the knob is pulled the traveller comes against the relative turnbuckle and this effort overcomes the weights 7x and 8x and works the cables 10 and 14 to lower the connected slides 7 and 8 and lower the door to upright closed position in the jams.

What is claimed is:

1. A door locking latch mechanism including a movable latch lever adapted to engage and prevent opening action of a door, a spring biased dog normally blocking the latch lever in effective position, a cable connected at one end to said dog and at its other end to a remote anchor, a floating pulley engaged in a bight of said cable, and a lock device suspending and operative to shift the pulley for pulling the cable to move the dog to unblocking position and disengage the latch lever from the door.
2. The mechanism of claim 1; said latch lever and said dog being operatively interconnected for action as a unit by the cable.
3. The mechanism of claim 1; and the dog being pivotally mounted on the lever for a limited degree of motion thereon.

CHARLES D. McDONALD.

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