F. C. BIRCH.

EXTENSION SIDEWALK ELEVATOR.

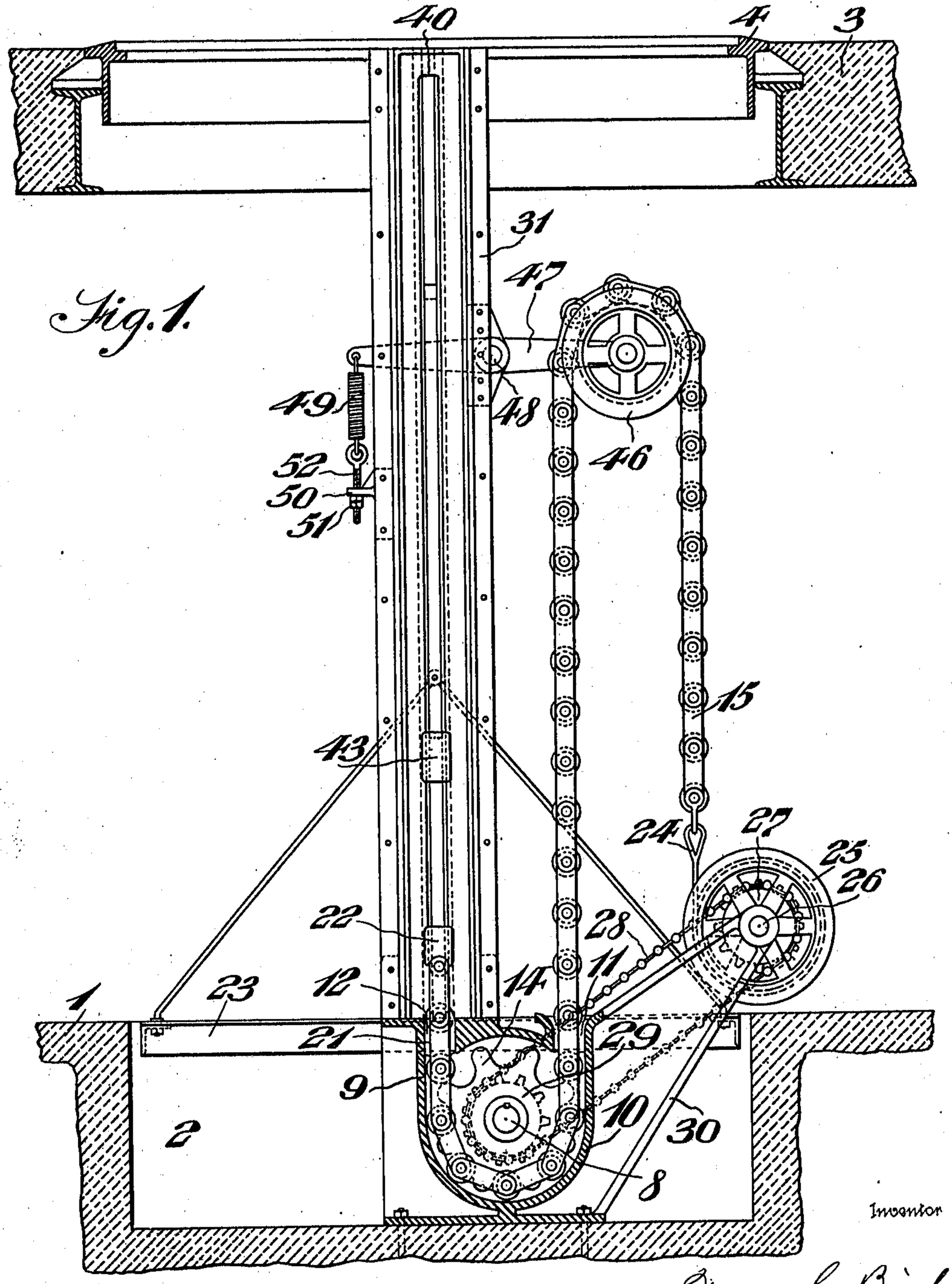
APPLICATION FILED FEB. 21, 1910.

982,929.

Patented Jan. 31, 1911.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses

H. C. Dieterich

L. Douville.

Inventor

Frank C. Birch.

By Wiedenheim & Fairbanks,

Attorneys

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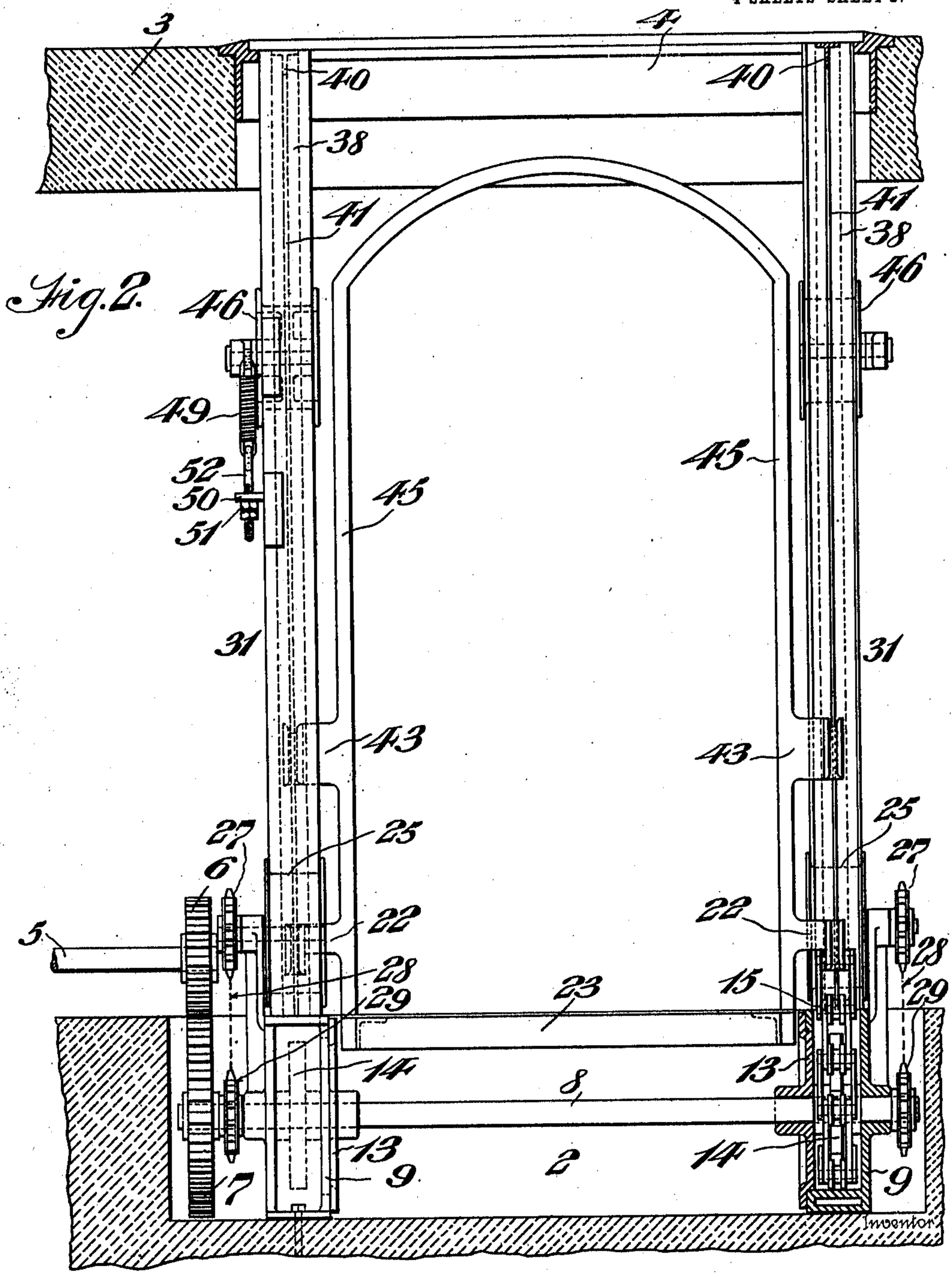
4 SHEETS—SHEET 2.

Fig. 2.



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Frank C. Birch.
By Wiedersheim & Fairbanks
Attorneys

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4 SHEETS—SHEET 3.

Fig. 3.

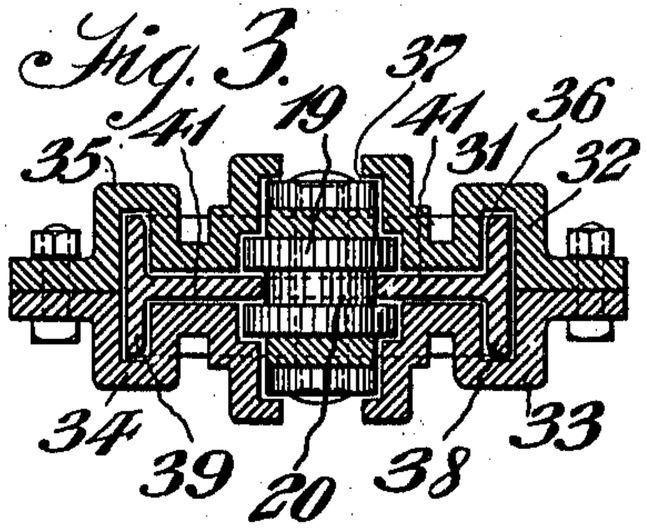


Fig. 4.

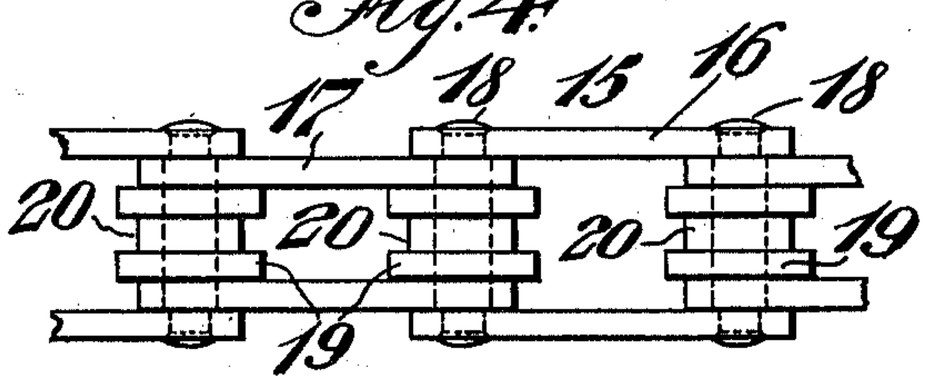


Fig. 5.

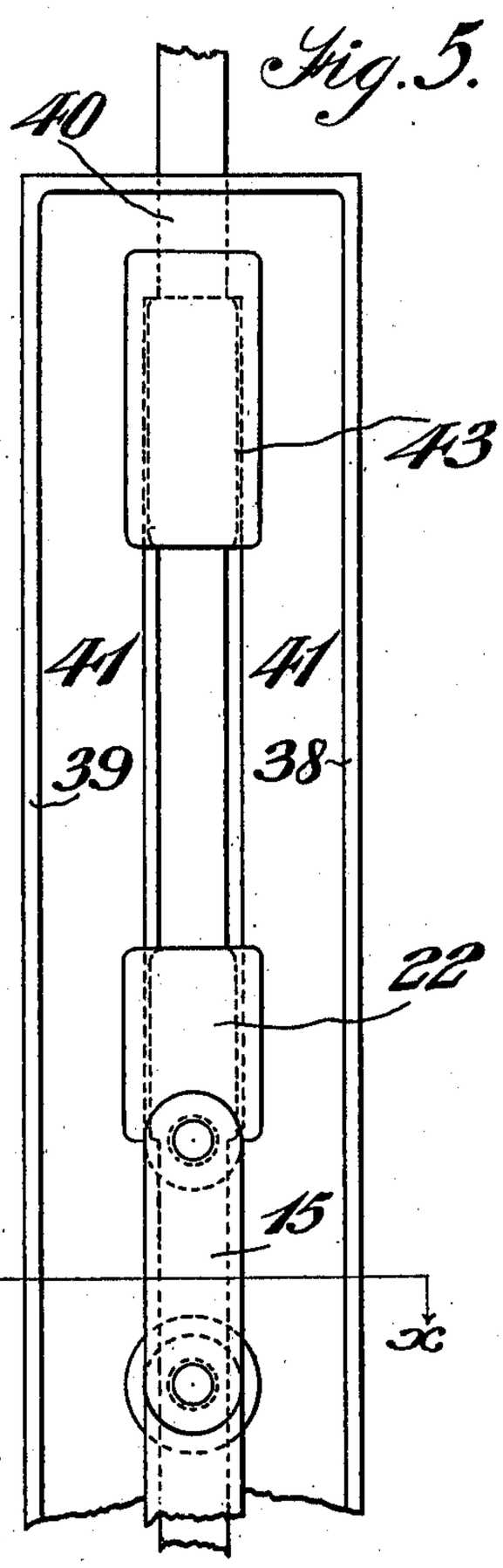
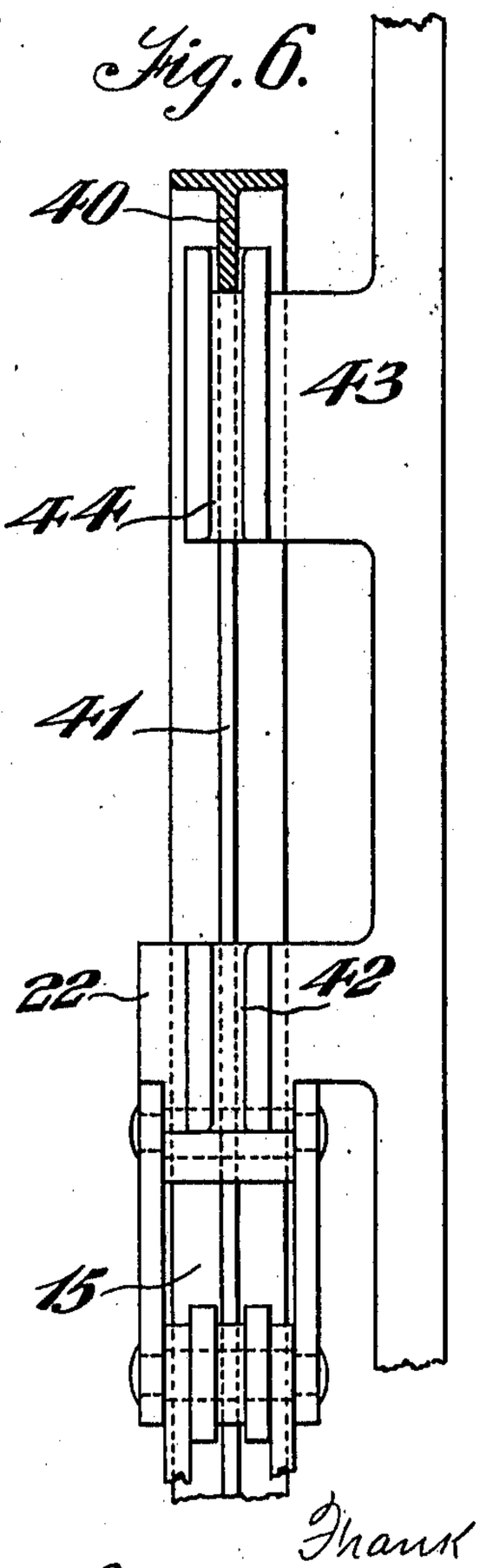


Fig. 6.



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H. G. Dieterich

L. Douville.

Inventor

Frank C. Birch,

By Wiedenheim & Fairbank.

Attorney

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4 SHEETS—SHEET 4.

Fig. 8.

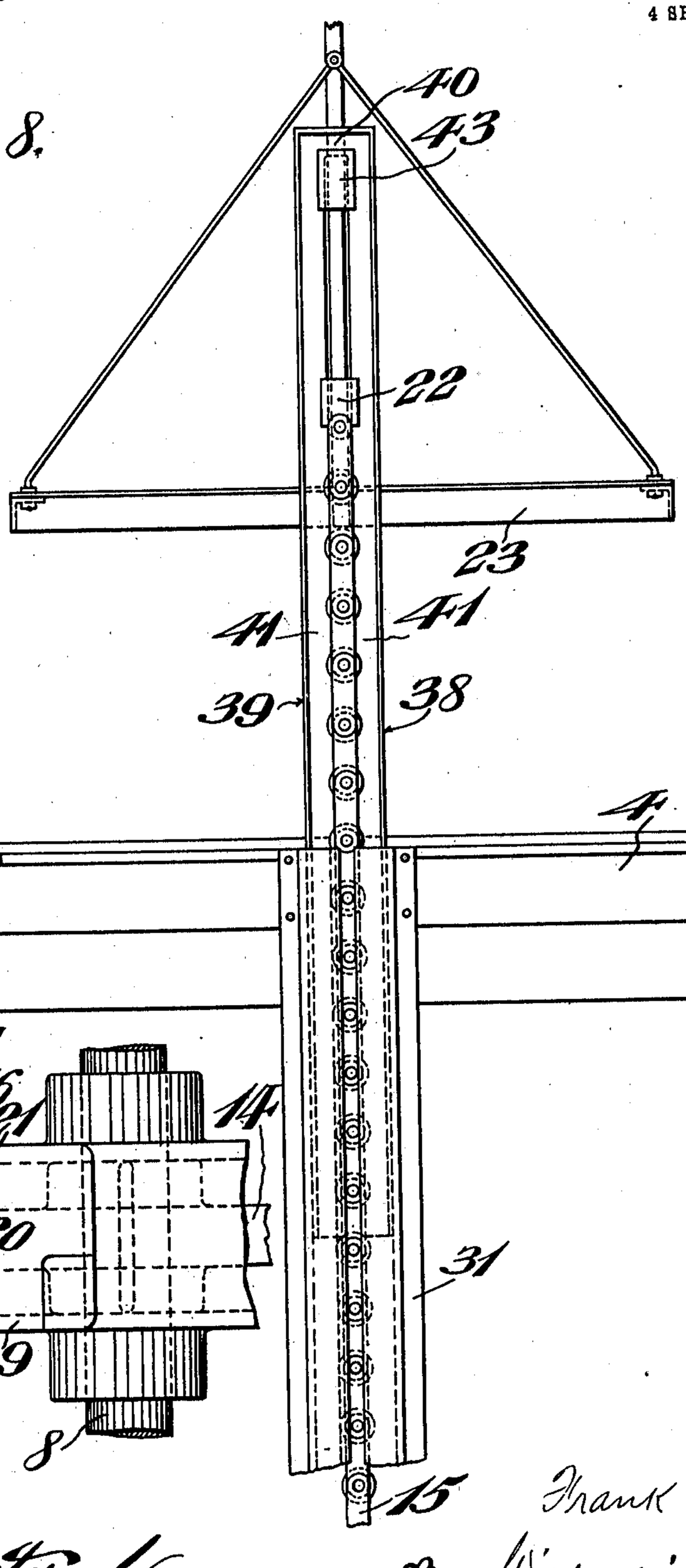

Fig. 7.

Witnesses

H. F. Dieterich

L. Douville.

Inventor

Frank C. Birch

By Wiedenheim & Fairbanks,

Attorneys.

UNITED STATES PATENT OFFICE.

FRANK C. BIRCH, OF PHILADELPHIA, PENNSYLVANIA.

EXTENSION SIDEWALK-ELEVATOR.

982,929. Specification of Letters Patent. **Patented Jan. 31, 1911.**

Application filed February 21, 1910. Serial No. 545,070.

To all whom it may concern:

Be it known that I, FRANK C. BIRCH, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Extension Sidewalk-Elevator, of which the following is a specification.

My invention relates to a new and useful extension sidewalk elevator wherein I provide means for raising and lowering the elevator so that the same can be raised to a required distance above the sidewalk level and is properly guided in its movement.

It further consists of a new and novel guide for the elevator car.

It further consists of a new and useful means for raising and lowering the car.

It further consists of other novel features of construction, all as will be hereinafter fully set forth.

Figure 1 represents a side elevation partly in section of a sidewalk elevator embodying my invention. Fig. 2 represents a front elevation and partial section of the parts shown in Fig. 1. Fig. 3 represents a sectional view on line *x*—*x*, Fig. 5. Fig. 4 represents a plan view of a portion of the chain employed. Fig. 5 represents a side elevation of a portion of the guide posts employed, showing the guide arms on the car. Fig. 6 represents a partial end elevation and partial section of the parts shown in Fig. 5. Fig. 7 represents a plan view of one of the sprocket casings employed, in detached position with the chain shown in the opening. Fig. 8 represents a front elevation, showing a portion of the guide post and extension members elevated and the car above the pavement.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings:—In the sidewalk elevators now employed wherein the elevator is raised above the sidewalk or pavement, it is customary to employ a plunger for this purpose which requires a corresponding well or pit to accommodate the same, which is of disadvantage and troublesome, especially where water is found.

My invention is designed to overcome these objections and in the drawings I have shown a construction which will operate successfully but it will be evident that changes may be made in the construction, the arrangement of the parts may be varied and other instrumentalities may be employed which will come within the scope of my invention and I do not therefore desire to be limited in every instance to the exact form as herein shown and described but desire to make such changes as may be necessary or desired.

1 designates the basement floor of a building, preferably having a sump or pit 2 extending below the surface thereof, a suitable distance, in order to accommodate certain portions of my mechanism.

3 designates the sidewalk above the basement of a building which is provided with a suitable opening having the frame 4 therein, it being understood of course that any suitable opening may be formed and any suitable form of frame may be employed, as may be desired.

5 designates a power shaft to which power may be imparted in any suitable manner, it being understood that the device can be operated by any suitable power, such as by hand, electricity or hydraulic power, as may be desired.

6 designates a gear mounted on the shaft 5 which meshes with a gear 7 carried by a shaft 8 which is suitably journaled, in the present instance, in the walls of the sprocket casings 9, which are situated at suitable points with respect to each other and which casings are, in the present instance, suitably secured within the pit 2 and the lower walls of which are curved as at 10, for a purpose to be hereinafter described. At suitable points in the casings are the openings 11 and 12, while one side 13 of the casing is removably attached thereto in order to have access to the interior thereof.

14 designates sprocket wheels which are suitably mounted on the shaft 8 within the sprocket casings 9 and each of which is adapted to suitably engage with sprocket chains 15 in order to actuate the same. The sprocket chains 15 are preferably formed of the outer bars 16 and the inner bars 17, which are suitably connected together, in the present instance by means of the shouldered pins 18 passing through suitable openings in the bars for that purpose, while mounted on the pins 18 are the loose rollers 19, in each of which is formed a groove 20, it being understood that the rollers contact with the teeth of the sprockets 14 and also with the inner wall of the curved portions 10 of the casings 9, as best understood from Fig. 1, in order to reduce the friction as far as possi-

ble and at the same time to form a positive guide for the chains 15 in their movement. Each of the openings 10 and 11 of the casing is provided with the projecting lugs or ears 21 which are adapted to engage with the bars 16 and 17 of the chain 15 in order to guide the same when entering and leaving the casings and preventing the chain from buckling in its movement. One end of each of the chains is connected with a guide arm 22 on the elevator car 23 and the opposite end of each chain 15 is connected with a rope 24 which is adapted to be connected with and to be rolled upon a drum 25, each of which is suitably supported adjacent a casing 9 and each drum, in the present instance, being carried on a shaft 26, on which is a sprocket 27, around which passes a chain 28 which also passes around a sprocket 29 carried by the shaft 8, whereby it will be understood that depending upon the rotation of the shaft 8 the drums 25 are properly rotated, to wind up or unroll the rope 24 therefrom, it being noted in the present instance that each drum is carried on arms 30 connected with a casing 9.

31 designates guide-posts on each side of the elevator car suitably situated with respect to the sprocket casings 9 and with respect to one of the openings therein, in the present instance, the opening 12. The guide-posts themselves serve as guides and are preferably formed of four sections 32, 33, 34 and 35 suitably connected together in order to form a T-shaped recess or guideway 36 therebetween and also a recess or guideway 37 which is of suitable shape to receive the chain 15 in its movement from the casing 9, it being understood that the said recess or guideway 37 is suitably formed in order that the walls thereof will engage with the rollers 19 of the chain in order to assist in holding the chain in proper position and prevent it from buckling.

38 and 39 designate guide members which are preferably formed T-shaped and serve as extension members for each of said guide-posts 31, said members being movably seated within the guideways 36 in the guide-posts 31, and it being noted that the said extension guides are preferably connected by the cross piece 40 at their upper portions in order to form practically an integral or single guide, both the parts 38 and 39 being movable together. It will be noted that the web 41 of each of these movable or T-guides projects sufficiently into the guideway recess 37 in the guide-posts 31 in order to engage with the walls of the grooves 20 in the rollers 19 so that said members also serve as guides for the chain 15. The guide-arm 22 on the car 23 is also provided with grooves 42 which are adapted to receive the edges of the webs 41 in order that the guide-arm will be guided thereby. The car 23 is also provided on opposite sides with the guide-arms 43 which are provided with grooves 44 in order to receive the webs 41 of the extension guides 38 and 39, it being noted that said guide-arms 43 extend from the car or the frame 45 thereof at a point above the guide-arms 22, and it will be further noted that as the car 23 is elevated the said guide-arms 43 will contact with the cross pieces 40, which connect the extension guides 38 and 39 and will elevate on each side of the car the said guides 38 and 39 in the guide-posts 31, carrying the same above the pavement 3, so that the said extension guides 38 and 39 on each side of the car will serve to guide the same after it has passed above the guide-posts 31 which are stationary beneath the pavement and said guides will also be engaged by the walls of the grooves 20 in the rollers 19 of the sprocket chain 15, serving to guide the chain in its movement as well as the car.

The sprocket chains 15 can be mounted and actuated in any suitable manner, but in the present instance I have shown sheaves 46, one for each of the chains and around which the chain passes, which sheaves are situated some distance above the sprockets 14 and in the present instance each being carried on an arm 47 pivoted at 48 to the guide-posts 31 and the opposite side of the pivot of the arm being connected with a spring 49 which is adjustably connected with a support 50 carried by the guide-posts 31, in the present instance, in order that the sheaves 46 will be supported in order to prevent any undue strain upon the chain 15 and to permit ease of movement thereof, it being understood that the tension of the spring 49 can be adjusted by proper operation of a nut 51 upon the eye bolt 52 which is suitably connected with the spring 49.

It will be noted that the guide-posts 31, in the present instance, are preferably connected, at their upper portion, to the frame 4 and that when the extension guides 38 and 39 on each side of the car are elevated above the pavement to guide the car in its movement, a suitable portion thereof will remain in the grooves in the guide-posts 31, so that these extension guides are always properly supported by the said guide-posts 31.

The operation of the device is as follows:—The floor of the elevator car by reason of the pit 2 is enabled to be placed on a level with the basement floor 1, in order to receive the articles and proper power being imparted to the shaft 5 the shaft 8 is rotated through the medium of the gears 6 and 7. The rotation of the shaft 8 will also rotate the sprockets 14, causing the chains 15 to be actuated thereby to raise the car 23. In its movement the chain is guided by means of the lugs 21 in the openings 11 and 12 in the casing as well as by the curved wall 10

of the casing and also by the recesses 37 in the guide-posts 31 and by the web 41 on each of the extensible members 38 and 39, whereby it will be understood that the chain is prevented from buckling and is properly guided in its movement to properly move the car 23. As the latter moves upwardly the guide-arms 43 thereof will at the proper time engage with the cross pieces 40 of the extension members or guides 38 and 39, lifting the same and carrying them upwardly so that the upper portions thereof are above the pavement 3, in order that as the upward movement of the car 23 is continued the same will be elevated above the guide-posts 31 and the extension members being engaged by the guide-arms 22 and 43 will serve as the guides for the elevator car, when it is above the pavement 3, so that the floor of the elevator car can be raised to the proper height of a wagon, for example, in order that the goods upon the elevator car can be loaded upon the wagon without any intermediate handling and without the necessity of being lifted from the pavement which is now the case where it is not possible to move the elevator car above the level of the pavement.

As the chains 15 move upwardly it will be understood that the ropes 24 connected therewith are unwound from the drums 25, the said drums being actuated in the proper direction for this purpose by means of the sprocket chains 28. By a reverse movement of the power shaft 5, the elevator car can be lowered, at which time the ropes 24 are rewound upon the drums 25, the latter being suitably actuated in the direction therefor by means of the said sprocket chains 28.

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

1. In a device of the character stated, a car, guide-posts therefor, extension guide members carried by the posts and elevated by the car and serving to guide the car when the same is elevated above the guide-posts, and means guided by the guide-posts against lateral displacement for raising and lowering the car.

2. In a device of the character stated, a car, guide-posts therefor, extension members movably supported by said guide-posts and adapted to be raised by the car to guide the latter when elevated above the guide-posts, and a sprocket chain engaging with said guide posts, held against lateral displacement and connected with said car and adapted to be actuated to raise and lower the car.

3. In a device of the character stated, a car, guide-posts therefor, extension members movably supported by said guide-posts and adapted to be elevated when the car is elevated to guide the latter when it is above the guide-posts, a sprocket chain for raising and lowering said car, said chain being guided in its movement and held against lateral displacement by said guide-posts, and means for actuating said chain.

4. In a device of the character stated, a car, guide-posts therefor, extension members carried by said guide-posts and adapted to be raised when the car is elevated to serve as guides for the car, sprocket chains connected with said car and engaging said guide-posts and members, whereby the chains are guided in their movement and held against lateral displacement, and means for actuating said chains to raise and lower the car.

5. In a device of the character stated, a car, guide-posts therefor, extension members carried by the guide-posts and adapted to be raised when the car is elevated, sprocket chains connected with said car, rollers carried by said chains and adapted to engage the guide-posts and members, whereby the chains are guided in their movement, and means for actuating said chains to raise and lower the car.

6. In a device of the character stated, a car, guide-posts therefor, extension members carried by the guide-posts and adapted to be raised when the car is elevated, sprocket chains connected with the car and adapted to engage said guide-posts, casings through which said chains pass, and guides on said casing to assist in guiding the chains in their movement.

7. In a device of the character stated, a car, guide-posts therefor, extension members carried by said guide-posts and adapted to be raised when the car is elevated to serve as guides for the car, sprocket chains connected with said car and engaging said guide-posts and members, means for actuating said chains to raise and lower the car, and casings around said actuating means and serving as guides for the sprocket chains in their movement.

8. In a device of the character stated, a car, guide-posts therefor, extension members carried by said guide-posts and adapted to be raised when the car is elevated to serve as guides for the car, sprocket chains connected with said car and in engagement with said guides and members, means for actuating said chains to raise and lower the car, and casings around said actuating means having curved walls with which the sprocket chains contact in order to serve as guides for the sprocket chains in their movement.

9. In a device of the character stated, a car, guide posts therefor, extension members carried by said guide-posts and adapted to be raised when the car is elevated to serve as guides for the car, sprocket chains connected with said car and engaging said guide-posts and members, means for actuating said chains to raise and lower the car,

casings around said actuating means and adapted to serve as guides for the chains in their movement thereabout, and means for taking up the chain and releasing the same.

10. In a device of the character stated, a car, guide-posts therefor, extension members carried by said guide-posts and adapted to be raised when the car is elevated to serve as guides for the car, sprocket chains connected with said car and engaging said guide-posts and members, means for actuating said chains to raise and lower the car, casings around said actuating means and adapted to serve as guides for the chains in their movement thereabout, and means actuated by the chain actuating means for taking up the chain and releasing the same, at the proper time.

11. In a device of the character stated, a car, guide-posts therefor, extension members carried by said guide-posts and adapted to be raised when the car is elevated to serve as guides for the car, sprocket chains connected with said car and engaging said guide-posts and members, guide arms on said car engaging with said guide-posts and members, means for actuating said chains to raise and lower the car, and means connected with said chains adapted to be wound and unwound for holding the chain in proper position for actuating the car.

12. In a device of the character stated, a car, guide-posts therefor, extension members carried by said guide-posts and adapted to be raised when the car is elevated to serve as guides for the car, sprocket chains connected with said car and engaging said guide-posts and members, guide-arms on said car engaging with said guide-posts and members, means for actuating said chains to raise and lower the car, and a rope connected with each of said chains adapted to be wound and unwound in order to hold the said chains in proper position for actuating the car.

13. In a device of the character stated, a car, guide-posts therefor, extension members carried by said guide-posts and adapted to be raised when the car is elevated to serve as guides for the car, sprocket chains connected with said car and engaging said guide-posts and members, guide-arms on said car engaging with said guide-posts and members, means for actuating said chains to raise and lower the car, ropes connected with said chains adapted to be wound and unwound in order to hold the said chains in proper position for actuating the car, and drums, suitably actuated, for receiving the ropes.

14. In a device of the character stated, a car, guide-posts therefor, extension members carried by said guide-posts and adapted to be raised when the car is elevated to serve as guides for the car, sprocket chains connected with said car and engaging said guide-posts and members, guide-arms on said car engaging with said posts and members, means for actuating said chains to raise and lower the car, ropes connected with said chains adapted to be wound and unwound in order to hold the same chains in proper position for actuating the car, drums for receiving the ropes, and means for rotating the said drums.

15. In a device of the character stated, a car, guide-posts therefor, extension members carried by said guide-posts and adapted to be raised when the car is elevated to serve as guides for the car, sprocket chains connected with said car and engaging said guide-posts and members, means for actuating said chains to raise and lower the car, and means for taking up the chain and releasing the same.

16. In a device of the character stated, a car, guide-posts therefor, extension members carried by said guide-posts and adapted to be raised when the car is elevated to serve as guides for the car, sprocket chains connected with said car and engaging said guide-posts and members, means for actuating said chains to raise and lower the car, and means actuated by the chain actuating means for taking up the chain and releasing the same at the proper time.

17. In a device of the character stated, a car, guide-posts therefor, extension guide members movably supported by the posts, sprocket chains for raising and lowering said car, said chains being guided in their movement and held against lateral displacement by said guide-posts and said members, and means for actuating said chains.

18. In a device of the character stated, a car, guide posts therefor, extension guide members carried by the posts and extended to guide the car when the latter is elevated above the guide posts, and means guided by the guide posts and held against lateral displacement for raising and lowering the car.

19. In a device of the character stated, a car, guide posts therefor, extension members movably supported by the guide posts and adapted to be extended to guide the car when elevated above the guide posts, and a sprocket chain engaging with said guide posts held against lateral displacement thereby and connected with said car and adapted to be actuated to raise and lower the car.

20. In a device of the character stated, a car, guide posts therefor, extension guide members carried by the posts and elevated to guide the car when the same is raised above the guide posts and lowered when the car is lowered, and means guided by the guide posts and by the extension members and held against lateral displacement for raising and lowering the car.

21. In a device of the character stated, a

car, guide posts therefor, extension guide members carried by the posts and extended to guide the car when the latter is elevated above the guide posts, and flexible means guided by the guide posts and held against lateral displacement within the same for raising and lowering the car.

22. In a device of the character stated, a car, guide posts therefor, extension guide members carried by the posts and extended to guide the car when the latter is elevated above the guide posts, flexible means guided by the guide posts and held against lateral displacement within the same for raising and lowering the car, and means for imparting an upward movement from below to said flexible means for raising the car.

FRANK C. BIRCH.

Witnesses:
WM. CANER WIEDERSEIM,
C. D. MCVAY.