

No. 646,900.

Patented Apr. 3, 1900.

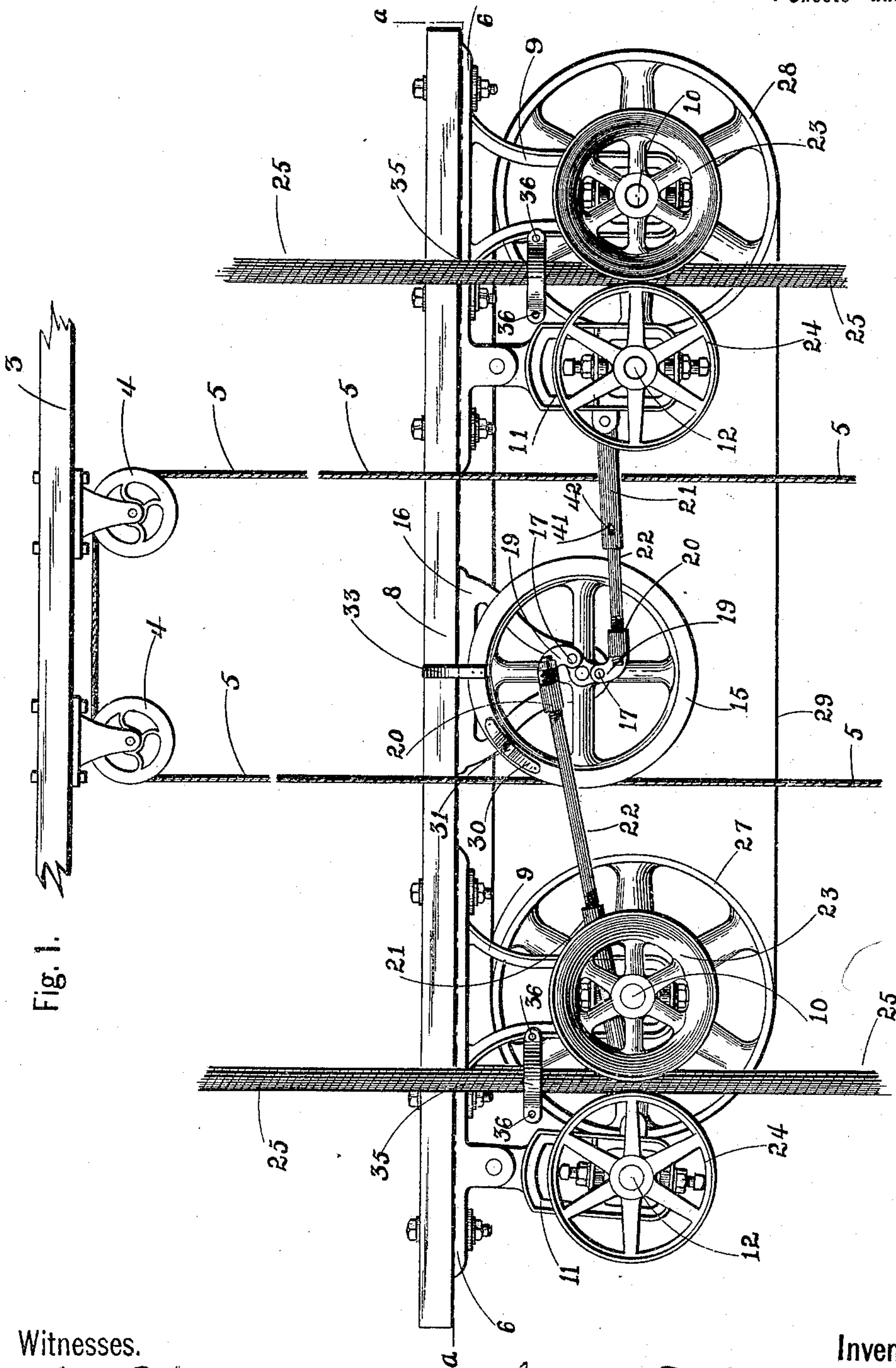
E. B. EVERINGHAM.

POWER ATTACHMENT FOR HAND ELEVATORS.

(Application filed Sept. 18, 1899.)

(No Model.)

4 Sheets—Sheet 1



Witnesses.

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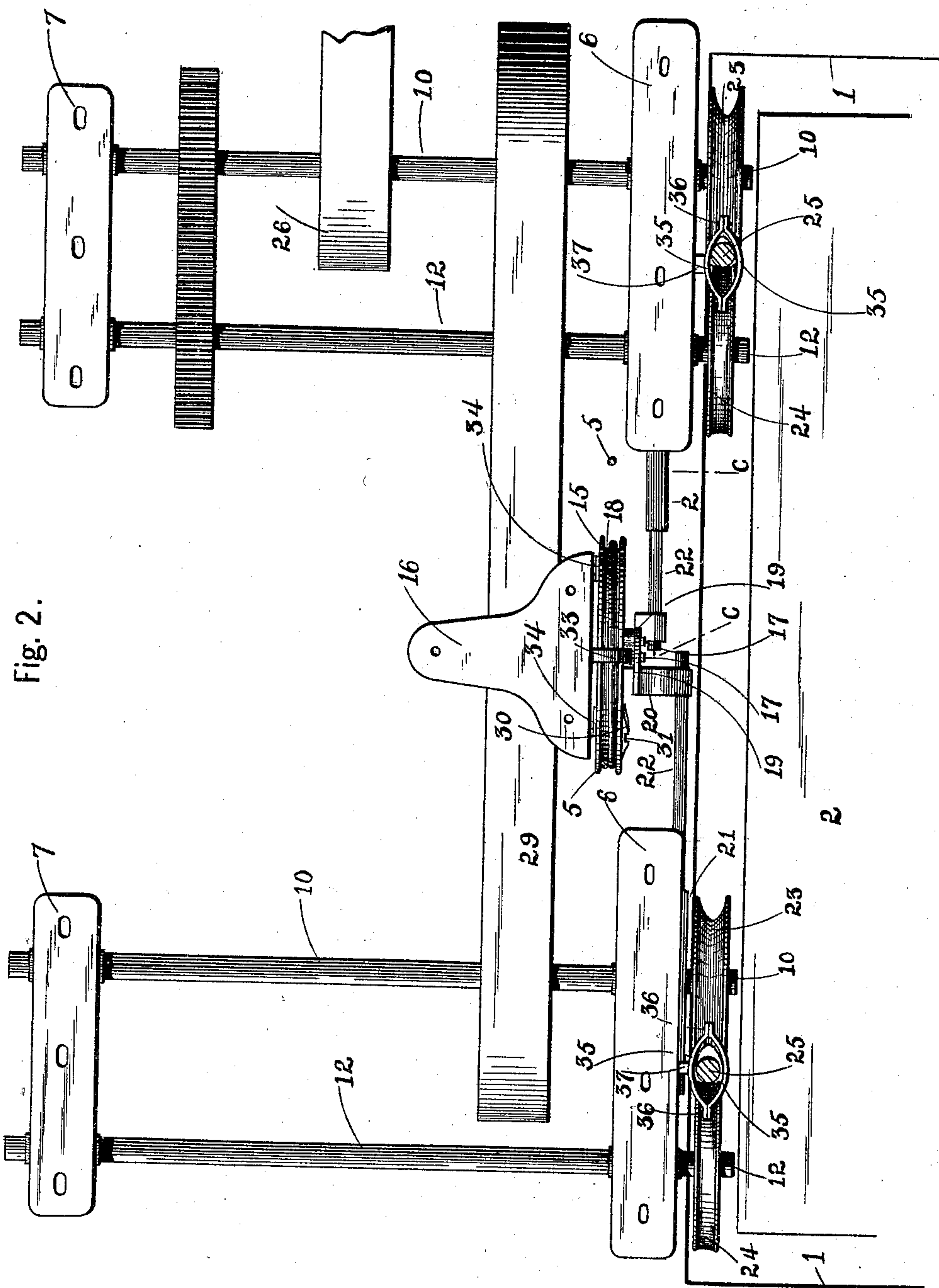


Fig. 2.

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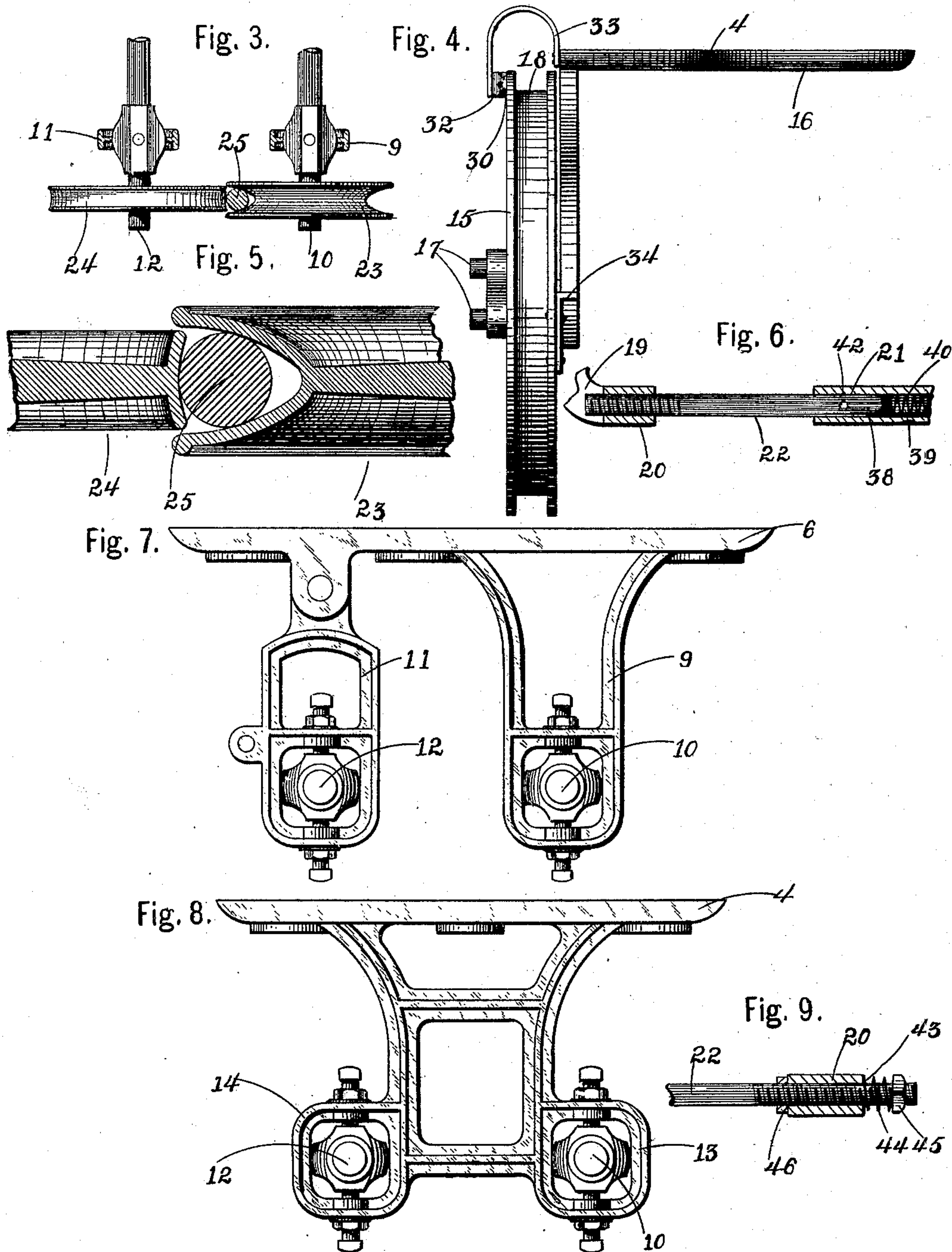
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4 Sheets—Sheet 3.



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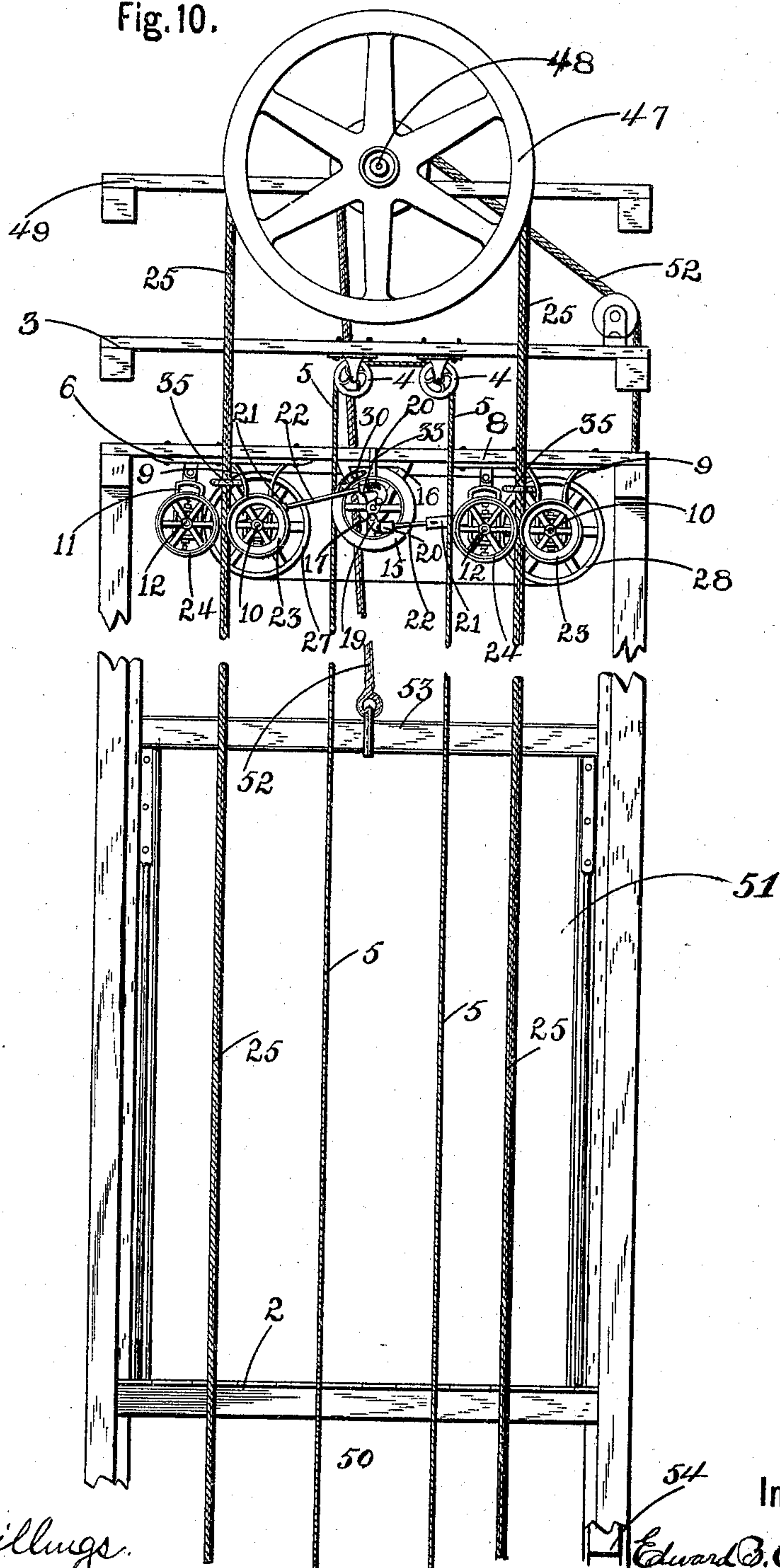
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4 Sheets—Sheet 4.

Fig. 10.



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UNITED STATES PATENT OFFICE.

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POWER ATTACHMENT FOR HAND-ELEVATORS.

SPECIFICATION forming part of Letters Patent No. 646,900, dated April 3, 1900.

Application filed September 18, 1899. Serial No. 730,823. (No model.)

To all whom it may concern:

Be it known that I, EDWARD B. EVERINGHAM, a citizen of the United States, residing at Warsaw, in the county of Wyoming and State of New York, have invented certain new and useful Improvements in Power Attachments for Hand-Elevators, of which the following is a specification.

My invention relates to an improved power attachment for hand-elevators; and the object of the invention is to provide a simple device that can be easily placed in position and operatively connected to a hand-operated elevator, thus converting it into a power-driven elevator.

For a full understanding of the merits and advantages of the invention reference is to be had to the accompanying drawings and the following description.

The invention is susceptible to various changes in the form, proportion, and minor details of construction without departing from the principle or sacrificing any of the advantages thereof; and to a full disclosure of the invention an adaptation thereof is shown in the accompanying drawings, in which—

Figure 1 represents a side elevation of a portion of an elevator equipped with my improved power attachment. Fig. 2 is a horizontal section on or about line *a a*, Fig. 1. Fig. 3 represents a top plan view of two of the opposed sheaves, fragmentary portions of their shafts, and a section through the supporting-brackets and the operating-cable. Fig. 4 represents an enlarged end elevation of the cranked controlling-wheel and its support. Fig. 5 is a fragmentary section through two of the opposed sheaves and the operating cable or rope to illustrate the three points of contact of said sheaves with said rope. Fig. 6 represents a section on or about line *c c*, Fig. 2, to illustrate the interior construction of the extensible spring-tensioned connection extending from one of the cranks of the controlling-pulley to one of the movable brackets. Fig. 7 is an enlarged side view of one of the front brackets in which the movable shaft is mounted and having means for affording a certain range of movement to said shaft. Fig. 8 is an enlarged side view of

one of the rear brackets. Fig. 9 is a fragmentary sectional view of the other connection between a crank of the controlling-pulley and one of the movable brackets. Fig. 10 represents a portion of an elevator-shaft having my improved power attachment connected thereto.

In referring to the drawings in detail like numerals designate like parts.

The elevator hatchway or shaft 1, a fragment being shown in Fig. 2, in which the car 2 travels, is of any ordinary and well-known form. The car 2 is elevated and lowered by mechanism of any well-known type, which in turn is operated by power through my improved attachment.

In Fig. 1 a fragment of a top timber 3 of a building is shown, having pulleys 4, attached thereto, upon which the hand-rope 5, which controls the operation of the power attachment, is supported.

The power attachment is preferably attached to the top floor of the building and consists of sheaves movable with respect to each other, between which the rope or cable operating the elevating mechanism is gripped, and a wheel or similar device operated by the hand-rope and controlling the movement of said sheaves relatively to each other.

One or more front and rear brackets 6 and 7 are attached to the floor 8 of the building, the front bracket 6 having a rigid extension 9, in which one end of a fixed shaft 10 is journaled, and a swinging extension 11, in which one end of a movable shaft 12 is journaled, and the rear brackets 7 having rigid extensions 13 and 14, the rear end of the movable shaft being journaled in the rigid extensions 14, so as to permit a limited range of movement therein to allow for the movement of the forward end.

Two of the front and rear brackets and the mechanism supported thereby are preferably employed, one set for elevating the car and the other for lowering the car.

A controlling-wheel 15 is mounted in a bracket 16, secured to the floor 8 between the two sets of brackets, and is provided with cranks 17 and a concaved periphery 18, around which the hand-rope 5 is wound or coiled. The cranks are connected to the swinging ex-

tensions 11 by the rods, which are preferably formed of the angular portions 19, which are journaled on the cranks 17 and have extensions 20, provided with sockets, the tubular portions 21, fastened to the movable extension 11, and the bars 22, having ends which respectively seat in the sockets in the extensions 20 and the openings in the tubular portions 21.

10 The parts of the connecting-rods are maintained in their position relatively to each other with a spring tension, and the office and construction of this portion of my invention will be more clearly explained farther on.

15 Sheaves 23 and 24 are arranged, respectively, upon the fixed shaft and the movable shaft and are adapted to be moved toward or from each other by the movement of the movable shaft toward or from the fixed shaft to clutch or free the cable or rope 25, operating the elevating mechanism.

20 A driving-pulley 26 is mounted on one of the fixed shafts, preferably the fixed shaft of the elevating set, and has connection with a source of power. Pulleys 27 and 28 are also mounted upon the fixed shafts and are operatively connected by a belt 29.

The mechanism is so arranged that the operating rope or cable is frictionally engaged or clutched between but one set of the opposed sheaves at a time and can be freed from both—i. e., when the rope or cable is held rigidly between the peripheries of one pair of rotating sheaves to elevate the car it is moved freely between the opposite pair attached to the lowering mechanism—and that when the sheaves are moved toward or from each other to an intermediate or central position the rope or cable will move freely between both sets. The peripheries of the opposed sheaves are concaved, so as to contact with the rope or cable at three points, (see Fig. 3,) thereby increasing the friction, lengthening the life of the rope or cable, and requiring less pressure to hold the rope or cable.

45 The cranked controlling sheave or wheel 15 is provided on one side with an enlargement 30, having a depression 31, in which the enlargement 32 at one end of a U-shaped spring 33 is adapted to seat to retain the wheel 15 in its central position with a spring tension and upon the opposite side with stops 34, which limit the partial rotation of the wheel in either direction by abutting against the edge of the bracket 16.

55 The sheaves are separated sufficiently to permit the free passage of the rope or cable when the controlling-wheel is in its central position, and one set is in rigid contact with the rope or cable while the other set is separated therefrom when the controlling-wheel is partially rotated to bring one of the stops against the edge of the bracket 16.

65 To prevent the disengagement of the rope or cable from between the peripheries of the opposed sheaves, guard devices are supported from one of the brackets and extend around

the rope. The preferred form of these guards is shown in the drawings, in which two curved pieces 35 are fastened together at their ends by bolts 36 and are attached to one of the brackets by the extension 37. (See Fig. 2.)

To permit the opposing sheaves to separate sufficiently to permit the passage of a splice or knot or other enlargement in the rope or cable, the parts of the connecting-rods are held in their position relatively to each other with a spring tension and are adapted to be moved against the spring-pressure to shorten or lengthen the rods sufficiently to allow the sheaves to separate from each other far enough to permit the splice or knot or other enlargement to pass, the spring automatically returning the parts to their original position upon the passage of the knot or other enlargement. The preferred construction of this portion is shown in the drawings, particularly in Figs. 6 and 9. In the construction shown in Fig. 6 one end 38 of the bar 22 slides in the socketed opening 39 in the tubular portion 21, and a spiral spring 40 is seated in the opening 39 in front of the end 38, with its end pressing against the said end 38 of the bar, the tendency of the spring being to force the end 38 outwardly, and thus lengthen the rod.

The passage of an enlargement, such as a splice or knot, between the sheaves separates them, forcing the end 38 into the opening 39 against the tension of the spring. To limit the longitudinal movement of the end 38 in the opening 39, a longitudinal slot or slots 41 are cut in the tubular portion of substantially the length of the desired movement, and a pin or pins 42, projecting from the end 38, extend into said slot or slots. (See Fig. 1.)

In the construction shown in Fig. 9 the extension 20 has a smooth-surfaced opening 43, and the screw-threaded end of the bar 22 slides easily through said opening, a spiral spring 44 being arranged upon the protruding end of the bar and held in place thereon by the nut 45, the tendency being to shorten the rod in length. A nut 46 is placed upon the bar in front of the extension 20 to limit the movement under pressure of the spring.

In the preferred construction of the attachment (shown in Fig. 1) it will be seen that the movable sheaves are each arranged on the left-hand side of the fixed sheaves and that to maintain them in operative proximity with a spring tension the parts of the rod connected to the movable sheaves of the set of sheaves on the left have to be arranged so that the tendency of the spring is to shorten the rod and the parts of the rod connected to the movable sheave of the set of sheaves on the right have to be arranged so that the tendency of the spring is to lengthen the rod.

In the construction shown in Fig. 10 a portion of an elevator-shaft is represented having a hand-operated car provided with a counterbalance-weight about equal in weight to the car, so that the car can be both raised

and lowered by the power attachment. In this view, 47 represents the large main pulley, over which the operating-rope 25 passes and which is mounted upon the shaft 48, journaled or supported in the upper flooring 49. 1 designates the elevator-shaft, and 2 the car, and a rope 52 is attached at its lower end to the top cross-beam 53 of the car, passes over the shaft 48, and is connected at its lower end to a counterbalance-weight 54.

It is obvious that the sheaves may be differently situated and the rods arranged to correspond without departing from this portion of my invention, the object being to maintain the opposed sheaves in operative proximity with a spring tension, so that they will separate to prevent the passage of a splice or knot or other enlargement.

For some hand-power elevators, especially those in which the elevator-car is returned or lowered by the weight of the counterweight, the lowering portion of the attachment may be dispensed with and the car lowered by hand.

This attachment is also applicable to hoists and other similar devices.

The operation of this device will be easily understood from the foregoing.

I claim as my invention—

1. An improved power attachment for elevators, comprising a cable controlling the operation of the elevating mechanism, sheaves movable toward or from each other and between which the cable is gripped, a rotatable wheel having cranks, connections between the cranks and the sheaves, and a hand-rope operating said wheel.

2. An improved power attachment for elevators, comprising a cable controlling the operation of the elevating mechanism, sheaves movable toward or from each other and between which the cable is gripped, a peripherally-grooved wheel, rod connections between said wheel and the sheaves and a hand-rope coiled around said wheel.

3. An improved power attachment for elevators, comprising a cable controlling the operation of the elevating mechanism, sheaves movable toward or from each other and between which the cable is gripped, a rotatable wheel having cranks, rods connecting said wheel-cranks and the sheaves, and means within reach of the operator for turning the wheel and moving the rods to move the sheaves toward or from each other.

4. An improved power attachment for elevators, comprising a cable controlling the operation of the elevating mechanism, sheaves movable toward or from each other and between which the cable is gripped, a rotatable wheel having cranks, connections between the cranks and the sheaves, and means within reach of the operator for turning the wheel and moving the sheaves toward or from each other.

5. An improved power attachment for elevators, comprising a cable controlling the op-

eration of the elevating mechanism, sheaves movable toward or from each other and between which the cable is gripped, a rotatable wheel having cranks, connections between the cranks and the sheaves, means within reach of the operator for turning the wheel and moving the sheaves toward or from each other, and stop mechanism for limiting the rotation of said wheel in either direction.

6. An improved power attachment for elevators, comprising a cable controlling the operation of the elevating mechanism, sheaves movable toward or from each other and between which the cable is gripped, a rotating wheel having cranks, connections between the cranks and the sheaves, means within reach of the operator for turning the wheel and moving the sheaves toward or from each other and a device for maintaining the wheel in its central position with a spring tension.

7. An improved power attachment for elevators, comprising a cable controlling the operation of the elevating mechanism, sheaves movable toward or from each other and between which the cable is gripped, a rotating wheel having cranks, connections between the cranks and the sheaves, means within reach of the operator for turning the wheel and moving the sheaves toward or from each other, a device for maintaining the wheel in its central position with a spring tension and stop devices for limiting the rotation of said wheel in either direction.

8. An improved power attachment for elevators, comprising a cable controlling the operation of the elevating and lowering mechanism, devices adapted to frictionally engage with said cable to actuate the same to elevate the car, devices adapted to frictionally engage with said cable to actuate the same to lower the car, and means within reach of the operator for moving said devices to free the cable therefrom or to frictionally engage with said cable to either elevate or lower the car.

9. A power attachment for hand-elevators comprising front and rear brackets attached to a suitable part of a building, shafts journaled in said brackets and movable toward or from each other and one of said shafts having operating connection with a source of power, sheaves mounted on said shafts between which the rope or cable controlling the elevating mechanism is adapted to be gripped, a wheel having connections with the shaft and means within reach of the operator to turn the wheel to move the shafts to either grip or free the rope or cable.

10. A power attachment for hand-elevators, comprising front and rear brackets attached to a suitable part of a building; shafts journaled in said brackets and one of said shafts capable of movement toward or from the other, sheaves mounted on said shafts between which the rope or cable controlling the elevating mechanism is adapted to be gripped, a rotatable wheel controlling the movement of the movable shaft, a hand-rope having oper-

ative connection with the wheel and adapted to turn the wheel in either direction to either grip or free the rope and means for limiting the rotation of the wheel in either direction.

5 11. The combination with a rope or cable controlling the elevating and lowering of an elevator, of a power attachment having opposed spring-tensioned sheaves between which the rope or cable is gripped; said
10 sheaves being adapted to separate sufficiently against the tension of the spring to permit the passage of a knob or other enlargement.

12. The combination with a rope or cable controlling the elevating of the elevator, of
15 a power attachment comprising opposed sheaves between which the rope or cable is gripped, a controlling device, and a connection between the sheaves and controlling-
20 wheel, said connection being extensible in length to permit the passage of knots or enlargements, as set forth.

13. The combination with a rope or cable controlling the elevator-operating mechanism, of a power attachment comprising sheaves
25 movable toward or from each other and adapted to grip the rope or cable, a controlling-wheel having a crank, a part journaled on said crank, a part having connection with one of the sheaves and provided with a socket,
30 a spring in said socket and a bar connected to the part journaled on the crank and having an end sliding in the socket against the spring, as set forth.

14. The combination with a rope or cable
35 controlling the elevator-operating mechanism, of a power attachment comprising two front and two rear brackets; each of said front brackets having a fixed extension and a swinging extension, and each of said rear
40 brackets having two fixed extensions, two fixed shafts each journaled at their respective ends in fixed extensions of one of the front and rear brackets, two movable shafts each having one end journaled in a fixed extension of the rear bracket and the other end
45 journaled in the swinging extension, sheaves mounted on said shafts between which the rope or cable is adapted to be gripped, a cranked controlling-wheel, connections between the cranks of said wheel and the swinging
50 extensions and a hand-rope operatively connected to said controlling-wheel.

15. The combination with a rope or cable controlling the elevator-operating mechanism, of a power attachment comprising two
55 sets of gripping mechanism, one for elevating and one for lowering, a rotatable wheel having operative connection with said sets, a hand-rope adapted to turn the wheel in either
60 direction to throw either of said sets into gripping position relatively to the rope or cable or to free the rope or cable from both, and spring means for maintaining the wheel in position when the rope is freed from both
65 sets.

16. The combination with a cable or rope controlling the elevator-operating mechanism,

of a power attachment comprising two sets of mechanism; one set for elevating and the other for lowering; a wheel having cranks, 70 a connection between the cranks and the sets of mechanism; said wheel being adapted to be turned in either direction to operatively connect either set to the rope or cable or free the rope or cable from both. 75

17. The combination with a rope or cable controlling the elevator-operating mechanism, of two sets of mechanism, one for elevating and one for lowering, a rotatable wheel having operative connection with said sets 80 and having an enlargement provided with a depression, and a spring device adapted to have its end spring into said device when the rotatable wheel is in its central position.

18. The combination with a rope or cable 85 controlling the elevator-operating mechanism, of two sets of mechanism, one for elevating and one for lowering, a rotatable wheel having operative connection with said sets and having an enlargement provided with a 90 depression, a spring device adapted to have its end spring into said device when the rotatable wheel is in its central position and two stops on the opposite side of the wheel for limiting its rotation in either direction. 95

19. An improved power attachment for elevators, comprising a cable or rope controlling the operation of the elevating mechanism, sheaves movable toward or from each other and between which the cable or rope is 100 gripped, a device controlling the movement of said sheaves, a hand-rope operating said device and spring means tensioning the sheaves for permitting said sheaves to open sufficiently to allow the passage of a knot, 105 splice or other enlargement.

20. An improved power attachment for elevators, comprising a cable controlling the operation of the elevating mechanism, sheaves 110 movable toward or from each other and between which the cable is gripped, a rotatable wheel, extensible spring-tensioned connections between said wheel and the sheaves, and means within reach of the operator for turning the wheel and moving the connections 115 to move the sheaves toward or from each other.

21. The combination with a rope or cable controlling the elevator-operating mechanism, of a power attachment comprising two 120 front and two rear brackets; each of said front brackets having a fixed extension and a swinging extension, and each of said rear brackets having two fixed extensions, two fixed shafts each journaled at their respective ends in 125 fixed extensions of one of the front and rear brackets, two movable shafts each having one end journaled in a fixed extension of the rear bracket and the other end journaled in the swinging extension, sheaves mounted on 130 said shafts between which the rope or cable is adapted to be gripped, a cranked controlling-wheel, extensible connections between the cranks of said wheel and the swinging ex-

tensions, a hand-rope operatively connected to said controlling-wheel, and springs attached to said extensions for maintaining them in their position with a spring tension and returning them to said position after the passage of an enlargement on the rope or cable through the sheaves.

22. The combination with a cable or rope controlling the elevator-operating mechanism, of a power attachment comprising two sets of mechanism; one set for elevating and the other for lowering; a device controlling said sets and adapted to be moved by the operator to operatively connect either set to the rope or cable or free the rope or cable from both, and spring means tensioning said sets for permitting the passage of a knot or enlargement on the rope or cable.

23. The combination with a cable or rope controlling the elevator-operating mechanism, of a power attachment comprising two sets of mechanism; one set for elevating and the other for lowering; and each having opposed sheaves between which the rope or cable is gripped, and a device controlled by the operator for moving the opposed sheaves of each set toward or from each other to operatively connect either set with the rope or cable or free the rope or cable from both, and springs for permitting a movement to the sheaves under tension to provide for the passage of a knot or enlargement.

24. The combination with a cable or rope controlling the elevator-operating mechanism, of a power attachment comprising two sets of mechanism; one set for elevating and the other for lowering, and each having opposed sheaves between which the rope or cable is gripped, a wheel, and crank connections between said wheel and each set of mechanism, said wheel being adapted to be turned in either direction to move the opposed sheaves of each set toward or from each other to operatively connect each set with the rope or cable or free the rope or cable from both.

25. The combination with a rope or cable controlling the elevator-operating mechanism, of a power attachment comprising sheaves movable toward or from each other and adapted to grip the rope or cable, a controlling-wheel having a crank, a part having connection with one of the sheaves and provided with a socket, a spring in said socket and a bar connected to the crank and having an

end sliding in the socket against the spring, as set forth.

26. The combination with a rope or cable controlling the elevator-operating mechanism, of two sets of mechanism one for elevating and one for lowering, a rotatable wheel having operative connection with said sets and adapted to move either set into operative position or both sets into inoperative position and stop devices for limiting the rotation of said wheel in either direction.

27. The combination with a rope or cable controlling the elevator-operating mechanism, of two sets of mechanism; one for elevating and one for lowering, a rotatable wheel having operative connection with said sets and adapted to move either set into operative position or both sets into inoperative position, stop devices for limiting the rotation of said wheel in either direction, and a spring device for maintaining said wheel in its central position with a spring tension.

28. An improved power attachment for elevators, comprising a cable controlling the operation of the elevating mechanism, sheaves movable toward or from each other and between which the cable is gripped, a rotatable wheel, connections between said wheel and the sheaves, means within reach of the operator for turning the wheel and moving the connections to move the sheaves toward or from each other, and stops for limiting the rotation of said wheel.

29. The combination with a rope or cable controlling the elevator-operating mechanism, of a power attachment comprising two front and two rear brackets; each of said front brackets having a fixed extension and a swinging extension, two fixed shafts each journaled at their respective ends in fixed extensions of the front and rear brackets, two movable shafts each having one end journaled in a fixed extension of the rear bracket and the other end journaled in the swinging extension, sheaves mounted on said shaft between which the rope or cable is adapted to be gripped, a controlling-wheel, connections between said wheel and the swinging extension, and a hand-rope operatively connected to said controlling-wheel.

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