

No. 771,534.

W. P. CLIFFORD.

PATENTED OCT. 4, 1904.

MOTOR.

APPLICATION FILED NOV. 20, 1903.

NO MODEL.

4 SHEETS—SHEET 1.

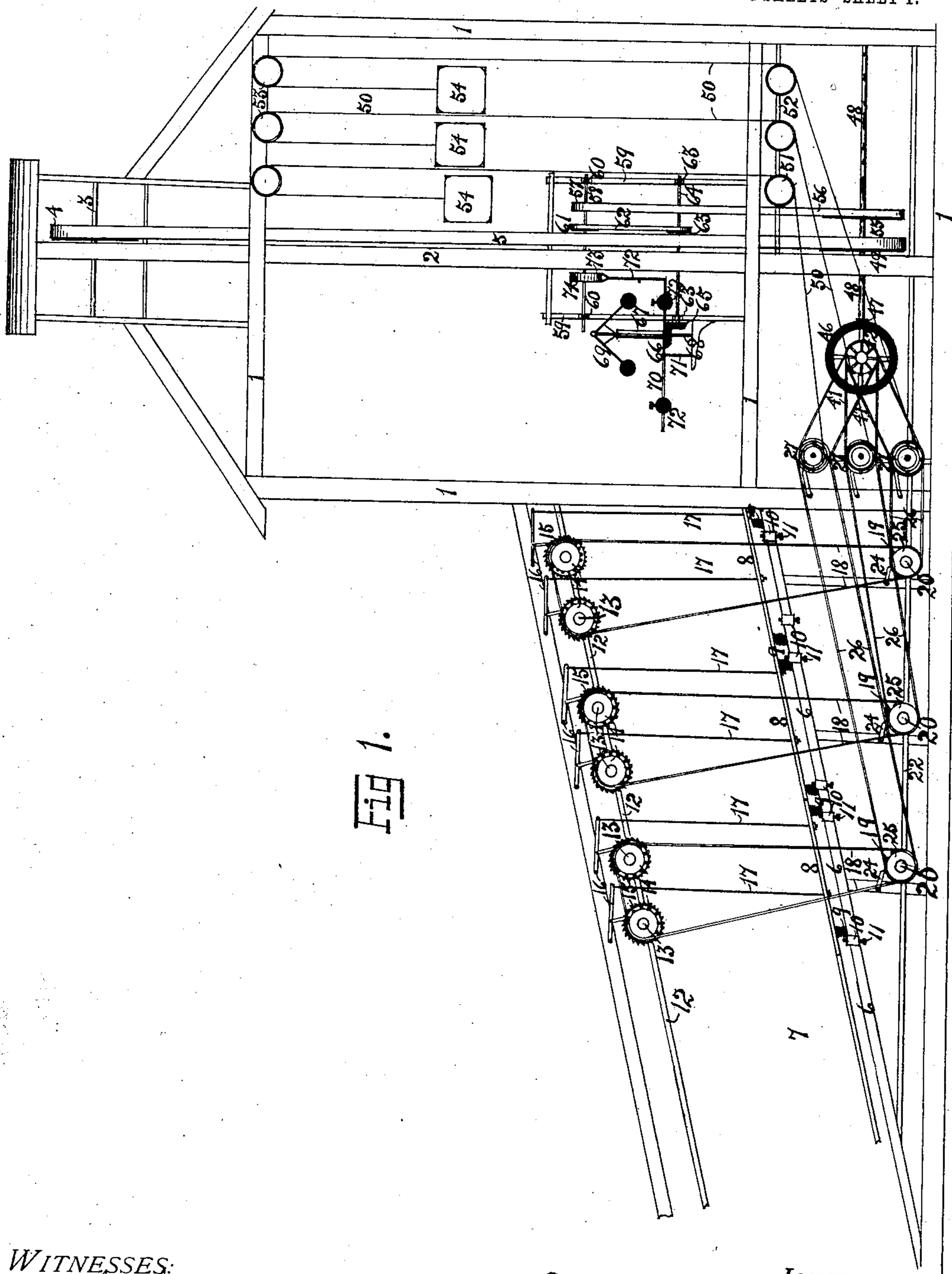


Fig 1.

WITNESSES:

W. H. Gerhart  
Earle Lytton Driggs

William P. Clifford  
By  
Obed C. Billman, His Attorney

No. 771,534.

W. P. CLIFFORD.  
MOTOR.

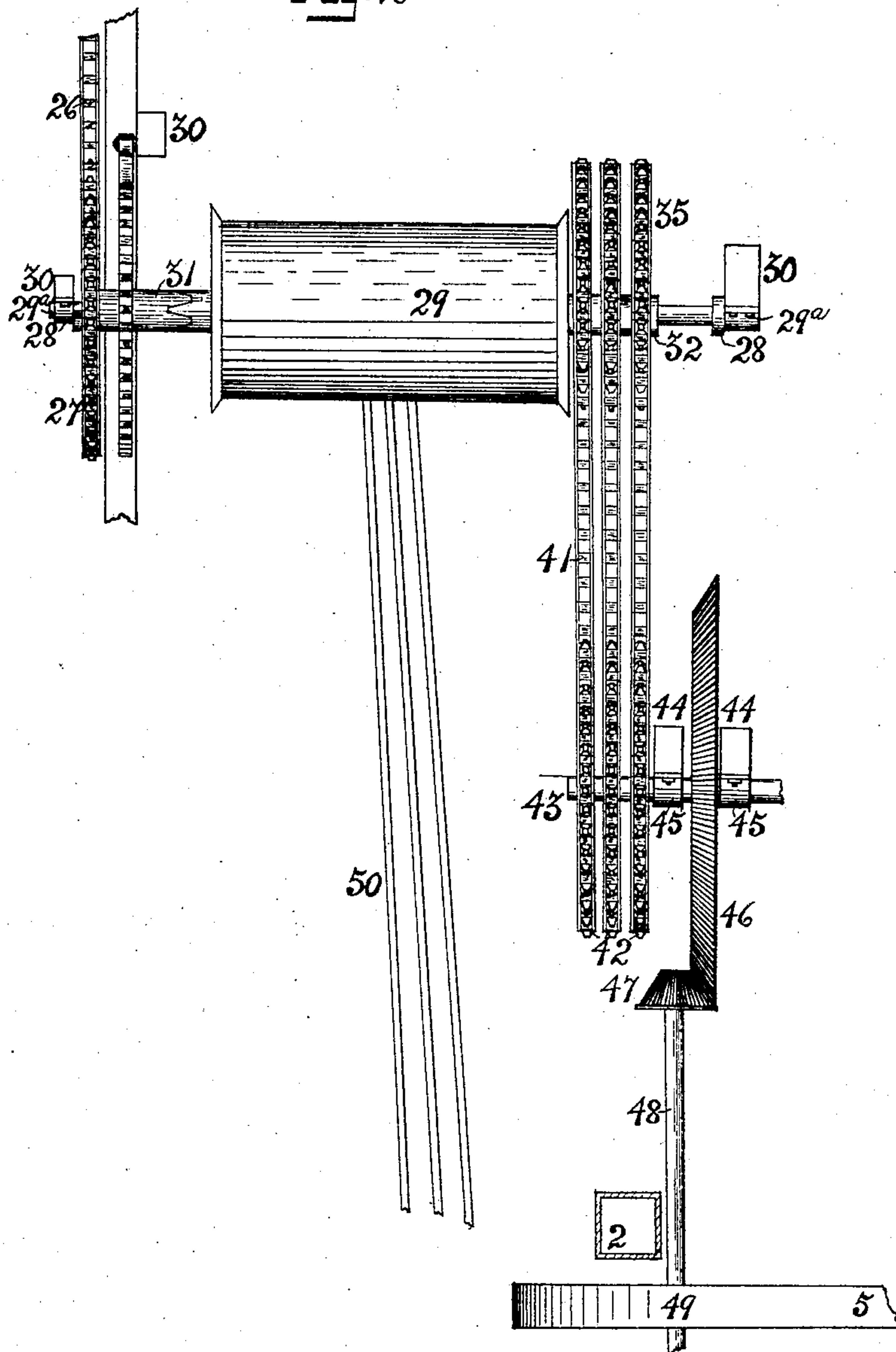
PATENTED OCT. 4, 1904.

APPLICATION FILED NOV. 20, 1903.

NO MODEL.

4 SHEETS—SHEET 2.

Fig. 2



WITNESSES:

WITNESSES:  
W. V. Gerhart.  
Earle Lytton Triggs.

*INVENTOR*

INVENTOR  
William P. Clifford  
BY  
Obed C. Billman, His Attorney

No. 771,534.

PATENTED OCT. 4, 1904.

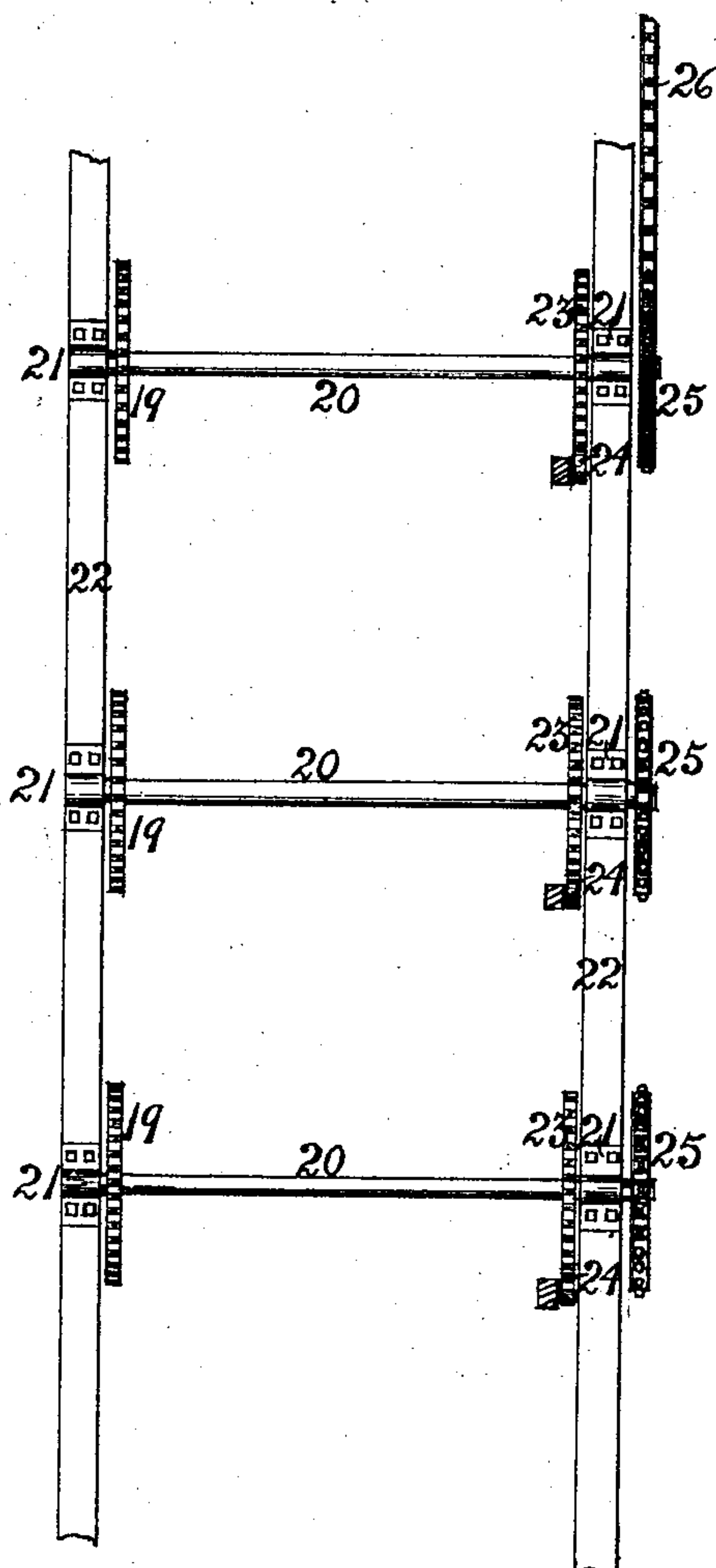
W. P. CLIFFORD.  
MOTOR.

APPLICATION FILED NOV. 20, 1903.

NO MODEL.

4 SHEETS—SHEET 3.

Fig. 3



WITNESSES:

*W. H. Gerhart.*

*Earle Lytton Triffin.*

INVENTOR

*William P. Clifford*

BY

*Obed B. Billman, His Attorney*

No. 771,534.

W. P. CLIFFORD.  
MOTOR.

PATENTED OCT. 4, 1904.

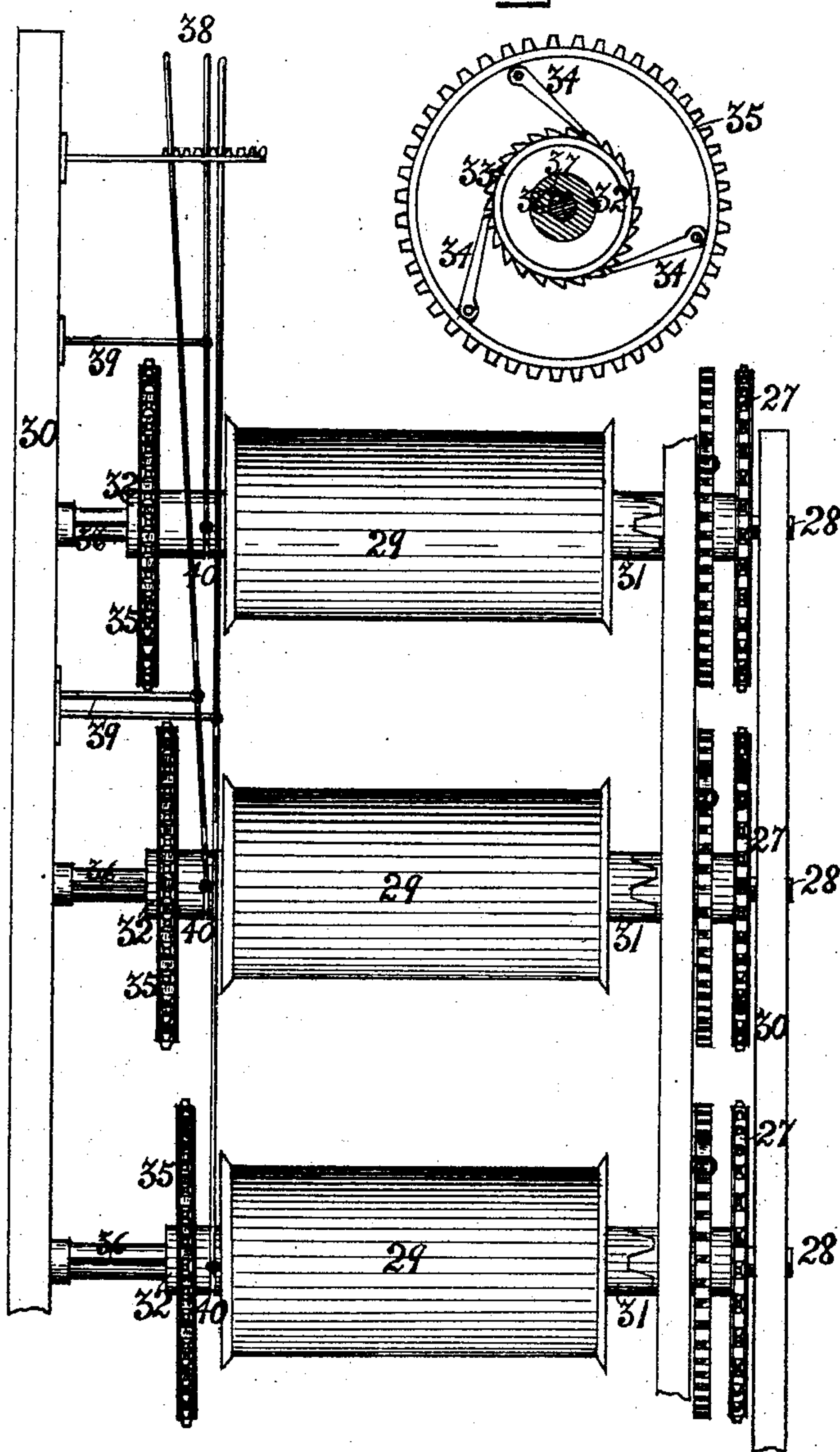
APPLICATION FILED NOV. 20, 1903.

NO MODEL.

4 SHEETS—SHEET 4.

Fig. 5

Fig. 4



WITNESSES:

*W. H. Gerhart*  
*Earle Lytton Triffitt*

INVENTOR

*William P. Clifford*  
BY  
*Obed B. Billman, His Attorney*



# UNITED STATES PATENT OFFICE.

WILLIAM P. CLIFFORD, OF ICONIUM, IOWA, ASSIGNOR OF ONE-HALF TO  
JOHN C. COOK, OF RUSSELL, IOWA.

## MOTOR.

SPECIFICATION forming part of Letters Patent No. 771,534, dated October 4, 1904.

Application filed November 20, 1903. Serial No. 181,894. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM P. CLIFFORD, a citizen of the United States, residing at Iconium, in the county of Appanoose and State of Iowa, have invented certain new and useful Improvements in Motors, of which the following is a specification.

My invention relates to improvements in motors designed with special reference for use in grain-elevators and similar structures where a simple, efficient, and economical elevating power is desired. The invention may also be found useful in small factories and, in fact, in any place where it is desired to operate any light machinery.

The invention is designed to be operated by means of the weight of the team, wagon, and load passing over a spring-yielding driveway divided into sections adapted to generate power by means of mechanism to be hereinafter described and storing up and utilizing the power thus generated by means of weights or springs or similar devices.

With these ends in view the invention consists in the novel construction, arrangement, and combination of parts hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims.

Referring to the drawings forming a part of this specification, Figure 1 is a view in elevation of my invention as applied to an ordinary grain-elevator. Fig. 2 is a top plan view of the winding-drums with connecting mechanism for running the elevator proper. Fig. 3 is a top plan view of the mechanism located beneath the driveway. Fig. 4 is a rear plan view of the winding-drums, showing a more detailed view of the connecting mechanism for running the elevator proper and the means for reversing the drums and throwing the same into and out of gear with said connecting mechanism. Fig. 5 is a detail view of one of the ratchet-sprocket-wheels of the winding-drums.

Similar numerals of reference indicate like

parts throughout all the figures of the drawings.

In the drawings, 1 designates the frame of an ordinary elevator-building provided with an elevator-box 2, containing the usual elevator-belt and buckets actuated by a drive-shaft 3 and pulley 4, receiving power by means of a main driving-belt 5, passing over a second pulley attached to the mechanism to be hereinafter described.

6 designates the supporting-beams of the driveway 7, provided with a platform divided into sections 8, suitably mounted on springs 9, supported on said supporting-beams 6 and designed to yieldingly hold and support the sections 8.

10 designates blocks provided with adjusting-bolts 11, designed to limit the movements of the spring-mounted sections 8 and regulate the dip or distance said sections will be depressed while being actuated by the team and load passing over the same.

Mounted in suitable journals attached to the overhead supporting-beams 12 above each section 8 is a set of shafts 13, provided with sprocket-wheels 14 and ratchet-wheels 15, actuated by means of pawls 16, connected to the sections 8 by means of rods 17.

18 designates sprocket-chains passing over the sprocket-wheels 14 and over sprocket-wheels 19, secured to the ends of shafts 20, mounted in suitable bearings 21, secured to beams 22, mounted beneath the driveway 7.

23 designates ratchet-wheels mounted on the shafts 20, provided with pawls 24, which prevent the shafts from revolving in a reverse direction. Upon the ends of the shafts 20 are secured sprocket-wheels 25.

26 designates sprocket-chains passing over said sprocket-wheels 25 and over sprocket-wheels 27, secured to shafts 28, carrying the winding-drums 29, slidably mounted thereon. The shafts 28 are mounted in suitable bearings 29<sup>a</sup>, secured to the upright supporting-beams 30. The winding-drums 29 are provided at one end with a sliding clutch 31,



adapted to be thrown into and out of engagement with the sprocket-wheels 27, and upon their opposite ends are provided with sleeves or ferrules 32, provided with ratchet-wheels 33, (see Fig. 5,) adapted to be engaged by a series of pawls 34, pivotally arranged within sprocket-wheels 35. The shafts 28 are provided at their ends with ribs or flanges 36, adapted to take into recesses 37 on the interior of the sleeves or ferrules 32, so as to permit the same, together with the attached sprocket-wheels 35, winding-drums 29, and clutches 31, to be moved laterally into and out of engagement with the sprocket-wheels 27 by means of operating-levers 38, pivotally mounted on supporting-arms 39, secured to one of the upright supporting-beams 30, the lower ends of which operating-levers 38 take into an annular recess 40 of the sleeves or ferrules 32.

41 designates sprocket-chains passing over the sprocket-wheels 35 and over sprocket-wheels 42, mounted on a shaft 43, secured to a supporting-beam 44 by means of a bearing 45. (See Fig. 2.) Carried by and mounted on said shaft 43 is a bevel gear-wheel 46, meshing with a pinion 47, secured to the end of a line-shaft 48, mounted in suitable bearings attached to the frame of the elevator-building. 49 designates a main driving-pulley mounted on said line-shaft 48, over which passes the main driving-belt 5, which passes over and revolves the pulley 4, mounted on shaft 3, which operates the elevator-belt in the elevator-box 2.

50 designates wire ropes attached to and adapted to be wound upon the winding-drums 29, passing over pulleys 51, suitably mounted on a supporting-beam 52 in the lower portion of the elevator-building and up and over a second series of pulleys 53, suitably mounted on one of the upper beams of the elevator-building and having attached to their overhanging ends weight-boxes 54, adapted to receive any proper form and suitable amount of weighting material. 55 designates a second pulley mounted on the line-shaft 48 and carrying a belt 56, passing over a pulley 57, mounted on a shaft 58, secured to supporting-beams 59 by means of bearings 60. 61 designates a second pulley mounted on said shaft 58 and carrying a belt 62, passing over a pulley 63, mounted on a shaft 64, secured to the supporting-beams 59 by means of bearings 63. Upon the end of said shaft 64 there is secured a bevel-gear 65, meshing with a second bevel-gear 66, secured to the lower end of a vertically-arranged revoluble sleeve 67, mounted on a vertical shaft 68 and having secured at its top ordinary governor arms and balls 69.

70 designates a bar pivotally mounted on a supporting-bar 71 and having slidably mounted thereon balls 72, which are adapted to be

adjusted to any desired point on the bar 70, whereby the speed of the governor and the mechanism controlled thereby may be regulated.

72 designates a bar pivotally secured at its lower end to the bar 70 and at its upper end to a spring 73, which acts as a brake on a pulley 74, secured to the shaft 58, around which the spring 73 extends.

The operation of the invention is as follows: The team, with wagon and load, enters and passes up driveway 7 and over the sections 8 of the platform and in passing over the various sections in ascending the platform depresses the same with the connecting-rods 17 and pawls 16, which said pawls actuate the ratchet-wheels 15, revolving the shafts 13, sprocket-wheels 14, sprocket-chains 18, sprocket-wheels 19, shafts 20, and sprocket-wheels 25. By means of the sprocket-chains 26 passing over the sprocket-wheels 25 and over the sprocket-wheels 27 motion is transmitted to the winding-drums 29, causing them to revolve and wind up the ropes 50 with the attached weights 54. In this way the operation of winding up the ropes 50 with weights 54 is continued while the team, with wagon and load, is passing over the various sections of the driveway until the main floor of the elevator is reached. If desired, the exit driveway may be similarly equipped with mechanism for still further storing up the energy of team and wagon passing over driveway, if found necessary or desirable. Furthermore, the driveway may be constructed of any desired length found necessary to secure the desired amount of power. After the load has been dumped the winding-cylinders 29 are thrown out of connection or gear with the sprocket-wheels 27 by means of the operating-levers 38, thus allowing the winding-drums 29 to revolve in an opposite direction, caused by the pull of the weights 54 unwinding the ropes 50 and causing the sprocket-wheels 35 to be revolved by reason of the pawls 34 coming into engagement with the ratchet-wheels 33. As the sprocket-wheels 27 are being revolved the sprocket-wheels 42 are caused to be revolved by means of the sprocket-chains 41, passing over the same, and the revolution of the shaft 43, carrying the bevel gear-wheel 46, is caused to be revolved, together with the pinion 47 meshing therewith. The revolution of the line-shaft 48, to which said pinion 47 is attached, causes the pulleys 49 and 55, carried thereby, to be revolved, and these pulleys by means of the belts 5 and 56 transmit motion to the elevator and governor, whereby the same are operated, respectively.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principles or sacrificing any of the advantages of this invention.



Having thus explained the nature of my invention and described a way of constructing and using the same, although without having attempted to set forth all the forms in which it may be made or all the modes of its use, I declare that what I claim, and desire to secure by Letters Patent, is—

1. A motor for grain-elevators, consisting of a suitable frame, a driveway provided with a spring-mounted platform, a series of ratchets mounted above said platform and connected to said spring-mounted platform by means of rods, a series of ratchet-wheels mounted on suitable shafts, and adapted to be actuated by said ratchets, a series of sprocket-wheels mounted on said shafts and carrying sprocket-chains, a second series of sprocket-wheels mounted on suitable shafts mounted beneath said platform and communicating with said first-mentioned series of sprocket-wheels by means of said sprocket-chains, a third series of sprocket-wheels mounted on the opposite ends of said shafts, a fourth series of sprocket-wheels secured to a series of shafts mounted on suitable upright supporting-beams and carrying a series of sprocket-chains passing over said third series of sprocket-wheels, a series of winding-drums slidably mounted on said last-mentioned shafts and adapted to be thrown into and out of engagement with said sprocket-wheels, a fifth series of sprocket-wheels slidably mounted on the opposite ends of said last-mentioned shafts and attached to said series of winding-drums, a sixth series of sprocket-wheels mounted on a shaft and carrying a series of sprocket-chains passing over said fifth series of sprocket-wheels, a bevel gear-wheel mounted on said shaft, a line-shaft suitably mounted and provided with a pinion meshing with said bevel gear-wheel, pulleys mounted on said line-shaft one of which is adapted to drive the elevator and the other the governor, a series of ropes, carrying weights, attached to and adapted to be wound upon said drums, governor mechanism attached to the elevator mechanism, and means for throwing the drums into and out of engagement with said fourth series of sprocket-wheels whereby the revolution of said drums may be reversed.

2. In a motor, the combination with a driveway provided with a spring-mounted platform, and mechanism for transmitting motion to a series of winding-drums; of a series of winding-drums slidably mounted on a series of shafts, a series of sprocket-wheels attached to said winding-drums, power-transmitting mechanism attached to said winding-drums, and means for throwing said winding-drums into and out of engagement with said power-transmitting mechanism.

3. In a motor, the combination with a series of winding-drums, provided with a series of

ropes carrying weights, a driveway provided with a spring-mounted platform and means connected to said platform for revolving said winding-drums to wind up said ropes carrying weights; of power-transmitting mechanism attached to said winding-drums, and means for throwing said winding-drums out of engagement with the means for revolving said winding-drums whereby the same are caused to be revolved in an opposite direction by the unwinding of said ropes.

4. In a motor, the combination with a series of winding-drums provided with power-transmitting mechanism, a driveway and a spring-mounted platform; of mechanism for actuating said winding-drums, and means for throwing said mechanism into and out of engagement with said winding-drums.

5. In a motor, the combination with a driveway provided with a spring-mounted platform, a series of winding-drums and mechanism for transmitting motion from said spring-mounted platform to said series of winding-drums; of power-transmitting mechanism attached to said winding-drums, and means for throwing said mechanisms into and out of engagement with said winding-drums.

6. In a motor, the combination with a driveway provided with a spring-mounted platform; of a series of pawls mounted above said platform, rods secured to said pawls and platform, a series of ratchet-wheels mounted on suitable shafts and adapted to be actuated of said pawls, a series of sprocket-wheels mounted on said shafts and carrying sprocket-chains, a second series of sprocket-wheels mounted on suitable shafts mounted beneath said platform, sprocket-chains communicating with said first and second series of sprocket-wheels, a third series of sprocket-wheels mounted on the opposite ends of said shafts, a series of shafts mounted on suitable upright supporting-beams, a fourth series of sprocket-wheels secured to said series of shafts, sprocket-chains passing over said third and fourth series of sprocket-wheels, and a series of winding-drums slidably mounted on said last-mentioned shafts and adapted to be thrown into and out of engagement with said fourth series of sprocket-wheels.

7. In a motor, the combination with a series of winding-drums, and a driveway provided with a spring-mounted platform; of mechanism for transmitting power from said spring-mounted platform to said series of winding-drums, means of revolving said winding-drums when said first-mentioned mechanism is thrown out of engagement therewith, and means for throwing said mechanisms into and out of engagement with said winding-drums.

8. In a motor, the combination with a winding-drum, a driveway provided with a spring-mounted platform, and mechanism for trans-



mitting power from said spring-mounted plat-  
form to said winding-drum; of means attached  
to said winding-drums for revolving the same  
in a reverse direction when said mechanism is  
5 thrown out of engagement therewith, power-  
transmitting mechanism adapted to be actu-  
ated by said winding-drum when same is re-  
volved in reverse direction, and means for

throwing said mechanisms into and out of en-  
gagement with said winding-drums. 10

In testimony whereof I have affixed my sig-  
nature in presence of two witnesses.

WILLIAM P. CLIFFORD.

Witnesses:

GEO. R. HAVER,

W. A. LEMASTER.