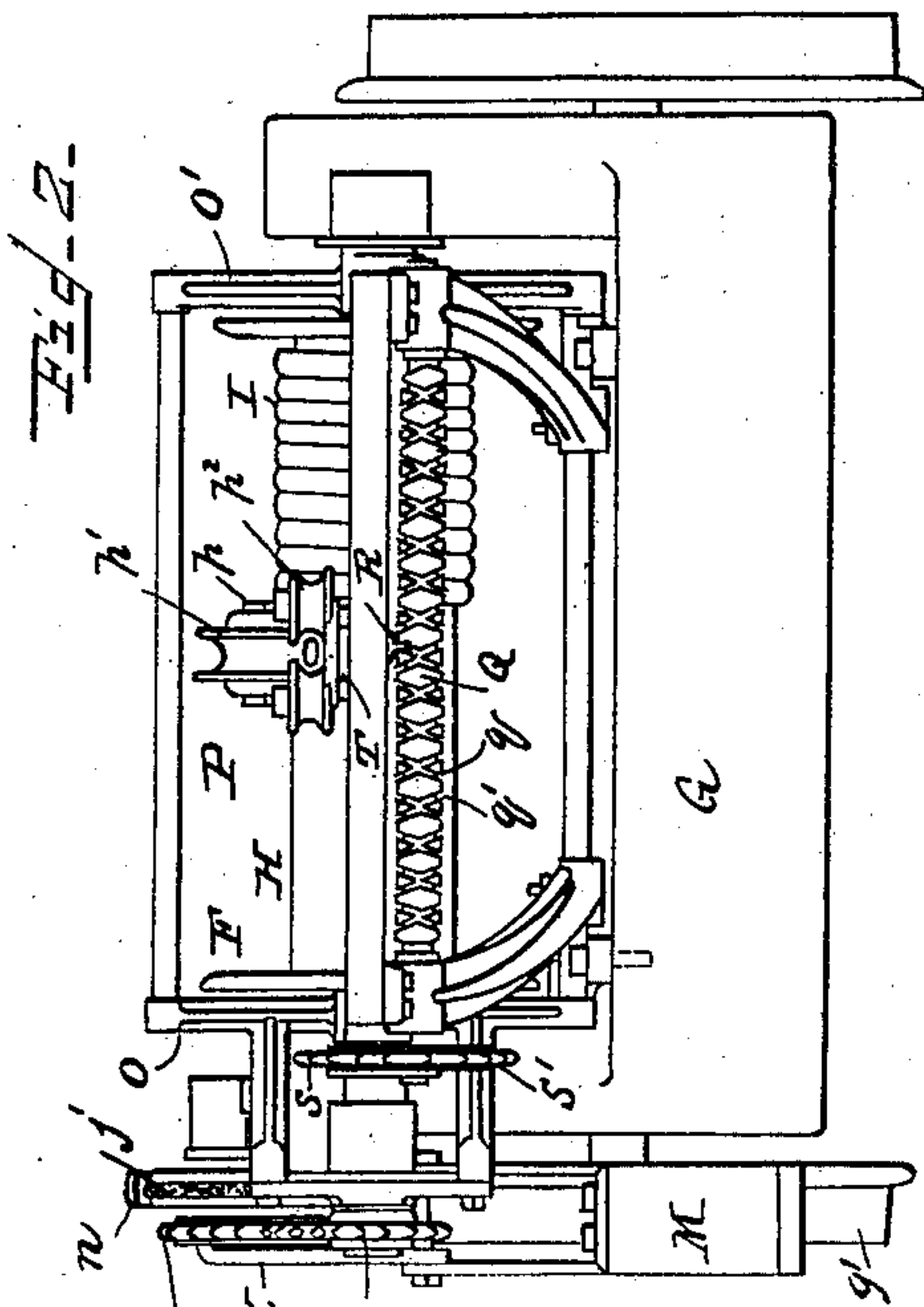
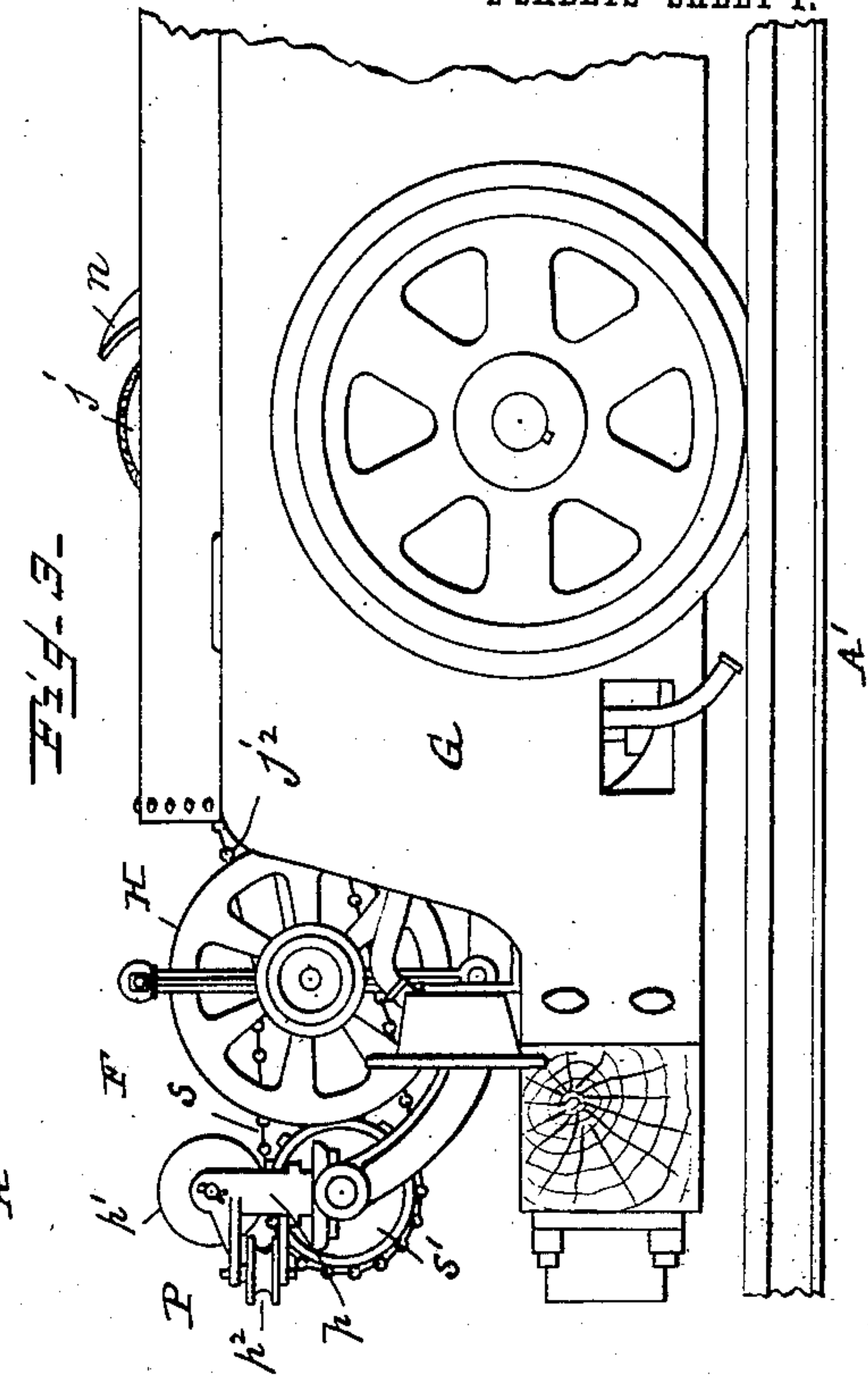
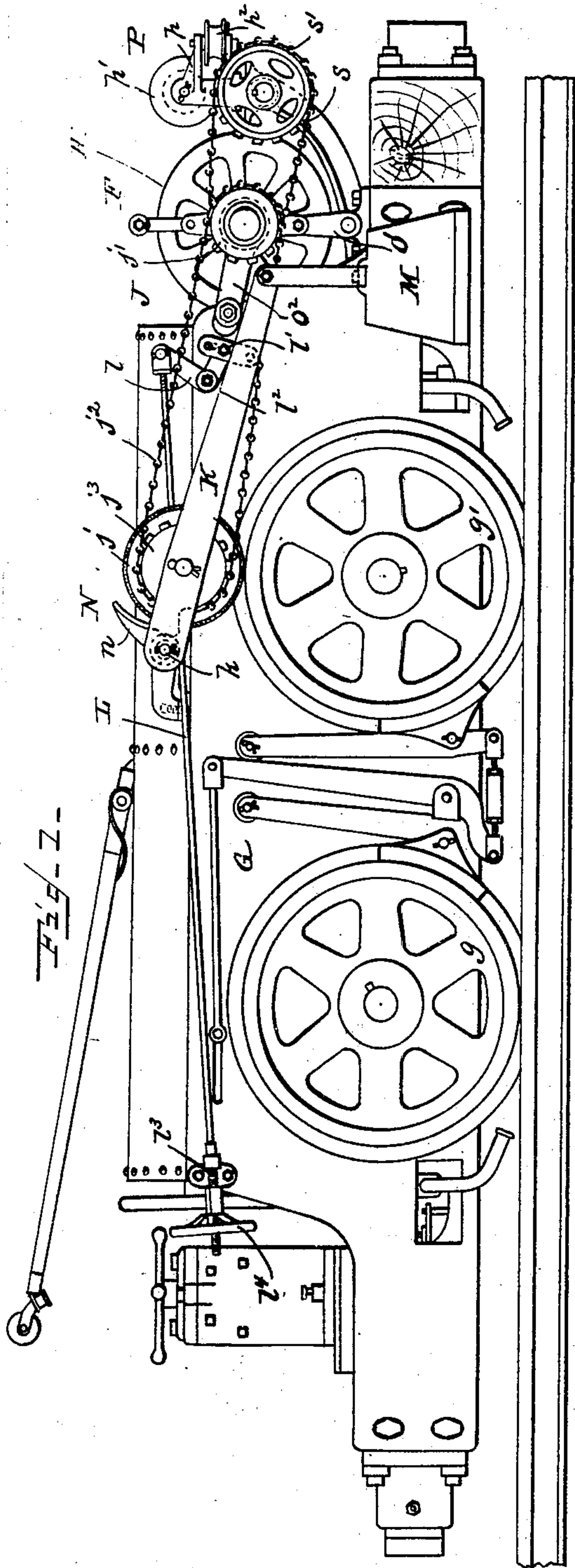


F. L. SESSIONS.
ELECTRIC VEHICLE AND CABLE REEL.
APPLICATION FILED MAR. 24, 1903. RENEWED JUNE 18, 1906.

915,311.

Patented Mar. 16, 1909.

2 SHEETS—SHEET 1.



Witnesses:
Edwin L. Jewell
E. H. Anderson

Inventor:
Frank L. Sessions,
by H. H. Bliss

F. L. SESSIONS.

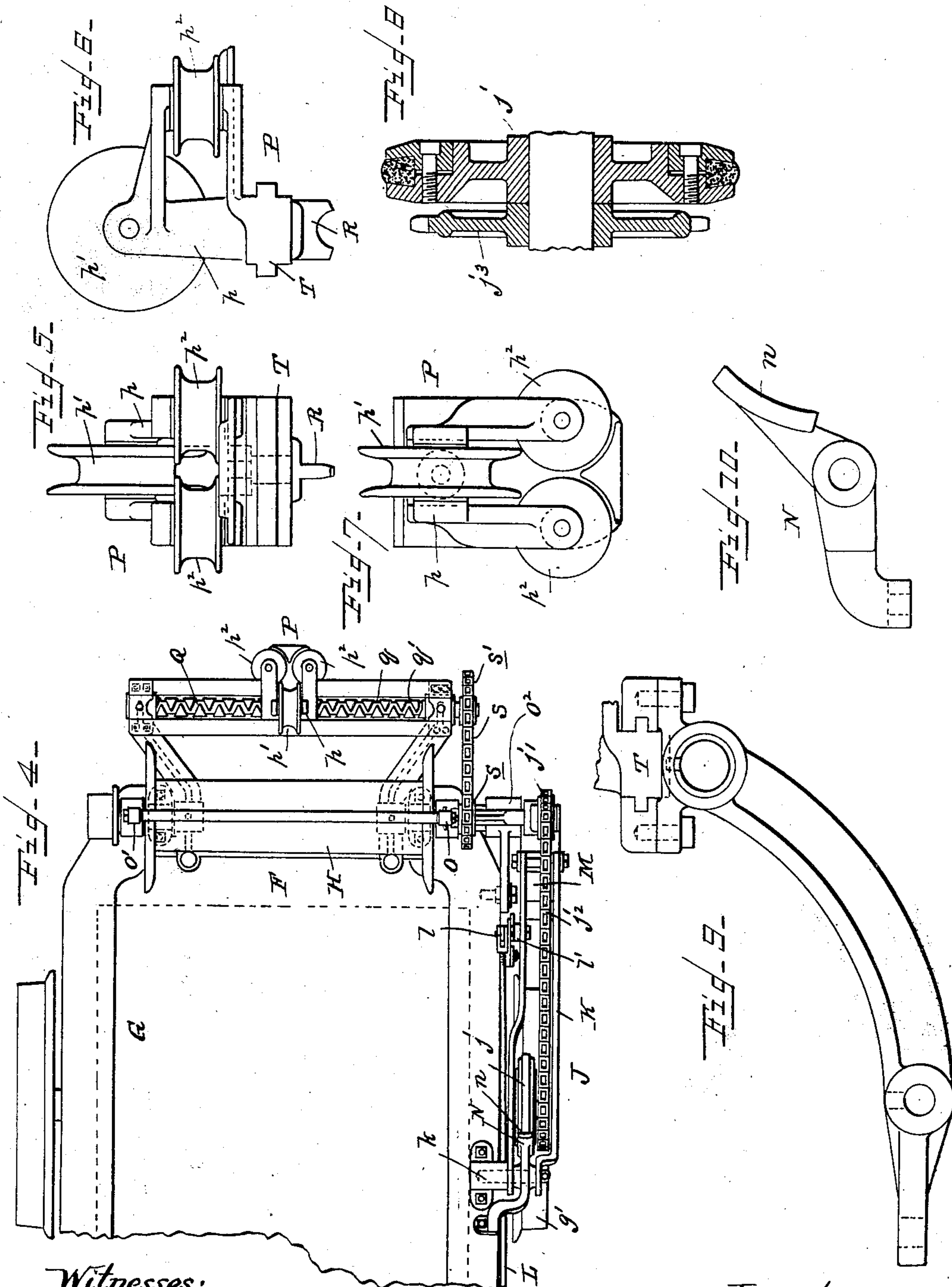
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att'y.

UNITED STATES PATENT OFFICE.

FRANK L. SESSIONS, OF COLUMBUS, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE
JEFFREY MANUFACTURING COMPANY, A CORPORATION OF OHIO

ELECTRIC VEHICLE AND CABLE-REEL.

No. 915,311.

Specification of Letters Patent.

Patented March 16, 1909.

Application filed March 24, 1903, Serial No. 149,377. Renewed June 18, 1906. Serial No. 322,236.

To all whom it may concern:

Be it known that I, FRANK L. SESSIONS, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Electric Vehicles and Cable-Reels, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in the devices by which an electric locomotive or other vehicle can be kept in electric connection with a more or less distant fixed conductor.

A mechanism embodying my improvements is particularly well adapted for use in the operating of coal mine locomotives such as are employed for hauling coal cars into and out from the mine and also employed for gathering the cars from different parts of the mine and forming trains thereof when bringing them out of the mine, and vice versa breaking up the trains of empty cars and distributing them from point to point.

Figure 1 is a side elevation of a mechanism embodying my improvements. Fig. 2 is an end elevation. Fig. 3 is a partial elevation from the side opposite to that shown in Fig. 1. Fig. 4 is a partial plan view. Figs. 5 to 10 show details.

In the drawings, I have selected a coal mine locomotive as a means of illustrating one of the ways in which my improvements can be employed.

The locomotive shown in the drawings is adapted to be moved and guided from place to place in the mine in any of the well known manners now employed for these purposes. Herein, F indicates as an entirety a winding mechanism by which a flexible conductor or paid section of conductor can be wound up or out as desired.

G indicates as an entirety the car or vehicle which carries the winding mechanism, it being adapted to move along the tracks at A' and having the wheels g g' fitted to the tracks.

The winding mechanism F includes with other parts a reel H mounted in suitable supports on the car. To this reel are connected the ends of the positive and negative conductor sections of wire respectively insulated but bound together in the form of a cable I, the end of the negative conductor being shown at i' , and that of the positive

at i . The other ends of the cable conductors are respectively connected to the fixed positive conductor at a remote point, and the negative or return conductor to some grounded object as the track rails in the main entry near the fixed conductor. The fixed conductor referred to is an insulated wire adapted to have a trolley wheel contact therewith. The fixed conductor and its opposite return conductor (as the track rail) are, in a mine, in the main entry. Expense will not permit the establishing of these fixed conductors in all of the branch entries or side entries and in the various rooms throughout the mine, and it is in these latter places that use is made of the reel conductors. As the car G moves from the fixed conductors, it pays out the cable. As it returns toward them, it takes the cable up and winds it again.

The winding mechanism is as a whole indicated by J. As here constructed, it consists of a wheel j actuated by the car wheels g' , preferably by frictional contact. Power for rotating the reel is transmitted from the wheel j to the wheel j' on the axis of the drum. In the present machine, this is accomplished by means of a sprocket gear having the chain j^2 , the sprocket wheel j^3 on the same shaft with the friction wheel j and the sprocket wheel j' on the reel shaft.

When it is desired to take up or cause the winding of the cable upon the reel, the wheel j is moved into engagement with the car wheel g' . The wheel j' is mounted on an arm or frame at K, pivoted at k . The frame is moved up and down by means of a rod L pivoted to a bell lever l which is flexibly connected by a link l' to the bar or frame K. The bell lever is pivoted at l^2 to the vehicle. At l^3 there is a lock and also preferably a power device in the form of a threaded nut. At l^4 there is a hand wheel. When this is turned in one direction, it not only permits the rod L to move longitudinally, with the result that the bar or frame K is allowed to move downward, but the threaded devices insure a positive force of the parts referred to. At M there is a weight which tends to draw the bar or frame K and the friction wheel j downward. I have found a weight of this character in many respects superior to the spring heretofore used by me; it maintains the contact of the frictional parts more firmly and steadily. Adjacent to the friction wheel j there is a brake device N, here

consisting of a curved plate or bar secured to the car, and having the operative curved part n so disposed that as the wheel j rises, it comes against this plate and is stopped in its rotation, and this in turn causes a stoppage of the turning of the winding reel. The reel is mounted on frame bars $O O'$ secured by the bars O^2 to the frame or body of the vehicle.

When the operator desires to let the cable pay out, he draws the rod L forward longitudinally, this resulting in the lifting of the swinging frame K , releasing it from the track wheels, and shortly thereafter a frictional engagement is attained of this friction wheel with the brake device at N , and such engagement he has under his control, increasing or decreasing the freedom of rotation for the reel as he deems necessary. When he desires the cable to be automatically taken up, he forces the rod L in the other direction, the screw and the weight bringing the arm K and the friction wheel j tightly against the track wheel, and thereupon through the sprocket gear the reel is wound in such direction as to take up the cable. The reel terminals of the negative and positive conductors in the cable are connected in any suitable way with the motor or motors on the vehicle. If one terminal of the motor circuits is connected to the metallic framework, the corresponding terminal of the reel cable is connected to the same; and consequently the current comes to the car over one of the reel conductors and returns over the other to the distant fixed conductor such as the rail in the mine entry, as aforesaid.

Another set of parts of great importance that I have devised for the winding mechanism is an automatically acting cable guide adapted to direct the cable both as it pays out and as it is taken up. The copper conductors in such cables are expensive, and the breaking that results from frequently bending them back and forth should be avoided. To avoid unnecessary bending of the wires and to insure that they shall be always properly flexed as they are leaving the drum or are approaching it, it is requisite that the cable should be accurately guided. This I accomplish by the devices illustrated. P is a traveler having a framework p , a vertically arranged grooved wheel p' and two horizontally arranged grooved wheels p^2 , the grooves on these being so related to each other that an anti-friction passageway is provided for the cable, the walls of which give it uniform support at all times. This traveler is moved back and forth parallel to the axis of the drum by an actuating mechanism properly "timed" relatively to the revolutions of the drum. As shown, it consists of the shaft Q having a right hand thread and a left hand thread arranged to intersect each other, and a projection R carried by the traveler P .

This projection fits in the threads q and q' , first one and then the other, the thread grooves at the ends of the shaft terminating in circular grooves which permit the projection R , after traveling through one of the grooves, to pass to the other and return. The pitch of the threads and the speed of rotation of shaft Q are arranged so that the resultant movement of the traveler corresponds with that of the convolutions of the cable as it wraps upon the drum. The shaft Q is driven from the drum by sprocket gear having the chain S engaging with the driving sprocket s on the drum shaft and the sprocket s' on the shaft Q . The traveler P is suitably supported by a guide at T . When the cable is unwinding, the shaft Q is turned in one direction by the sprocket gear, and it advances the traveler in such way that the convolution of the cable which is leaving the drum passes directly through the anti-friction guideway. And on the other hand, when the cable is being taken up and power is applied from the car wheel g' to the drum, the latter imparts a reverse rotation to the shaft Q , and the traveler is moved in the opposite direction to guide the cable as it winds on the drum.

What I claim is:

1. The combination with the vehicle having the driving wheel or power wheel, of the cable reel, the driving sprocket chain, devices for connecting the sprocket chain to the cable reel, means for connecting the sprocket chain with the said driving wheel or power wheel, and means for throwing out of action the last said connecting devices, and simultaneously applying a brake to control the travel of said chain substantially as set forth.

2. The combination with the vehicle having the power or driving wheel, of a reel for winding and unwinding cable, the sprocket chain for driving said reel, means interposed between said chain and said wheel, adapted when in frictional engagement with the wheel to cause the driving of the chain when the wheel is revolving, the brake shoe, and means for bringing said last described means alternately into engagement with said shoe and power wheel, substantially as set forth.

3. The combination with the vehicle having the driving wheel or power wheel, the reel for winding and unwinding the cable, the power-transmitting devices interposed between the said power wheel and the reel, the movable frame or arm for the power-transmitting devices, the weight connected to the said frame or arm and adapted to move the power-transmitting devices into their operative position and to hold them therein, and means for holding the power-transmitting devices in inactive position in opposition to the weight, substantially as set forth.

4. The combination with the vehicle having the power wheel or driving wheel, of the reel for winding and unwinding the cable, the power-transmitting devices interposed between the power wheel and the reel, the movable support for the power-transmitting devices, means for holding the power-transmitting devices in their operative position, a manually controlled device for moving the power devices to an inoperative position, and supplemental power devices connected with the manually controlled devices for increasing or assisting in holding the power-transmitting devices in operative position, substantially as set forth.

5. The combination with the vehicle having the power wheel or driving wheel, the reel for winding or unwinding the cable, the sprocket chain having sprocket connection with the reel, the sprocket wheel for driving the chain movable from an active to an inactive position, means interposed between the power wheel and the sprocket wheel for transmitting power to the sprocket wheel when in active position, and means for holding the driving sprocket wheel in its active position, substantially as set forth.

6. The combination with the vehicle having the power wheel or driving wheel, of the reel for winding and unwinding the cable, the friction wheel having a bearing support movable relatively to the driving wheel and the reel, the positively acting power-transmitting devices interposed between the friction wheel and the cable reel, and means for throwing said friction wheel into and out of active position relative to the power wheel, substantially as set forth.

7. The combination with the vehicle having the power wheel or driving wheel and the reel for winding and unwinding the cable, of the positively acting power-transmitting devices interposed between the power wheel and the reel, and the frictional power-transmitter interposed between the power wheel and the positively acting power-transmitting devices, substantially as set forth.

8. The combination with the vehicle having the power wheel or driving wheel, of the reel for winding and unwinding the cable, the train of positively acting power-transmitting devices interposed between the reel and the power wheel, and the checking or retarding devices adapted to engage with the initial elements of said train of transmitting devices, substantially as set forth.

9. The combination with the vehicle having the driving wheel or power wheel, of the reel for winding and unwinding the cable, the friction wheel adapted to engage with the power wheel, the train of power-transmitting devices interposed between said friction wheel and the reel, and the brake or retarding device adapted to engage with said friction

wheel when out of engagement with the power wheel, substantially as set forth.

10. The combination with the vehicle having the driving wheel or power wheel, of the reel for winding and unwinding the cable, the power-transmitting friction wheel interposed between the power wheel and the reel, and the brake or retarding device adapted to engage with said friction wheel independently of the reel, substantially as set forth.

11. The combination with the vehicle having the driving wheel or power wheel of the reel for winding and unwinding the cable, the train of power-transmitting devices interposed between the power wheel and the reel, the swinging support for said train of transmitting devices, the weight adapted to draw the said swinging support downward, and means under the control of the operator for moving said support upward, and means for positively fastening it in its uppermost position, substantially as set forth.

12. The combination with the vehicle having the driving wheel or power wheel, of the reel for winding and unwinding the cable, the sprocket wheel connected to the reel, the sprocket chain connected therewith, the sprocket wheel for driving the chain, the rising and falling support for the driving sprocket wheel, means for connecting the sprocket wheel with the power wheel, the weight for holding the last said means in their operative position, and means under the control of the operator for holding them in their inactive position, substantially as set forth.

13. The combination with the vehicle and the cable reel thereon, of the power devices for rotating the reel, to wind a cable thereon, the brake for controlling the rotation of said reel during the unwinding of the cable therefrom, the transversely moving cable-guide, power devices connecting the reel and the cable-guide, whereby the former operates the latter, as the cable is wound or unwound, substantially as set forth.

14. In a gathering locomotive, the combination with a suitable electric locomotive, of a cable reel mounted thereon, a train of power transmitting mechanism for driving said cable reel including a friction drive and an endless chain, means for connecting said train of power transmitting devices to and disconnecting it from a rotating part on the car, and a friction retarding device for controlling the unwinding movements of the reel.

15. In a gathering locomotive, the combination with a suitable electric locomotive of a cable reel carried thereby, a train of power transmitting devices interposed between said cable reel and a rotating part on the car and including in said train an endless chain driving element and a friction drive, means

for making said train of power transmitting devices operative or inoperative at will to transmit power to drive said reel, and a friction retarding device for controlling the unwinding movements of the reel.

16. In a gathering locomotive, the combination with a vehicle having supporting wheels, of the cable reel carried by said vehicle, an endless chain drive for said cable reel, and means for connecting said endless chain with or disconnecting it from one of said vehicle supporting wheels at will.

17. In a gathering locomotive, the combination with a suitable locomotive, of a cable reel mounted thereon, a train of power transmitting devices interposed between said reel and a rotating part on the car and including in said train an endless chain driving element, means for connecting said chain with and disconnecting it from said rotating part on the car, and a friction retarding device for controlling the unwinding movements of said reel.

18. In a gathering locomotive, the combination with a suitable electric locomotive, of a cable reel mounted thereon, an endless chain drive for said cable reel, means for connecting said chain to and disconnecting it from a rotating part on the car, and a friction retarding device for controlling the unwinding movements of said reel.

19. In a gathering locomotive, the combination with a locomotive frame, supporting wheels therefor and a motor on the frame, of a cable reel, a friction wheel for actuating said cable reel, a driving chain connecting said reel and said friction wheel, means for throwing said friction wheel into and out of its power transmitting position, and a friction retarding device for controlling the unwinding movements of said reel.

20. In a gathering locomotive, the combination with a suitable electric locomotive, of a cable reel mounted thereon, a friction wheel for actuating said cable reel, a chain connection between said friction wheel and said cable reel, means for throwing said friction wheel into and out of driving relation with a rotating part on the car, and a friction retarding device for controlling the unwinding movements of said reel.

21. In a gathering locomotive, the combination with a movable vehicle, and a cable reel carried thereby, of a train of power transmitting devices interposed between said reel and a rotating part on the car and including in said train an endless chain driving element, means for making said chain operative or inoperative at will to transmit power to drive said reel, and a friction retarding device for controlling the unwinding movements of said reel.

22. In a gathering locomotive, the combination with a movable vehicle, and a cable reel carried thereby, of a train of power trans-

mitting devices interposed between said reel and a rotating part on the car and including in said train a friction drive and an endless chain power transmitting element, means for making said chain operative or inoperative to drive said reel, and a friction retarding device for controlling the unwinding movements of the reel.

23. In a gathering locomotive, the combination of a truck, a motor mounted thereon, truck wheels driven by said motor, a cable reel mounted upon said truck, a flexible conductor arranged to be reeled upon and unreel from said reel, a friction driving wheel, an endless chain driving connection between said driving wheel and said reel, means for throwing said friction driving wheel into and out of operative position, and a friction retarding device for controlling the unwinding movements of said reel.

24. In a gathering locomotive, the combination of a truck, a motor mounted thereon, truck wheels driven by said motor, a cable reel mounted upon said truck, a flexible conductor arranged to be reeled upon and unreel from said reel, a friction driving wheel, an endless chain driving connection between said driving wheel and said reel, means for throwing said friction driving wheel into and out of operative position, means tending normally to hold said friction driving wheel in its operative position, and a friction retarding device for controlling the unwinding movements of said reel.

25. The combination of a vehicle having supporting and driving wheels, a cable reel mounted on said vehicle, a driving sprocket chain connected with said reel for positively driving the latter, and means for intermittently connecting said sprocket chain with a supporting wheel on the vehicle.

26. The combination of a vehicle having supporting and driving wheels, a cable-winding and unwinding reel mounted thereon, a train of power transmitting devices including a friction wheel interposed between a rotating part on said vehicle and the reel, and a retarding device adapted to engage with said friction wheel.

27. The combination of a vehicle having supporting and driving wheels, a cable winding and unwinding reel mounted thereon, a train of power transmitting devices including a friction wheel interposed between a rotating part on said vehicle and the reel, means for making said train of power transmitting devices active or inactive during the travel of said vehicle, and a retarding device adapted to engage with said friction wheel to control the unwinding movements of the reel.

28. The combination of a vehicle having supporting and driving wheels, a cable winding and unwinding reel mounted thereon, a train of power transmitting devices including a friction wheel interposed between a

rotating part on said vehicle and the reel, means for making said train of power transmitting devices active or inactive during the travel of said vehicle, and a non-rotary retarding device adapted to engage with said friction wheel to control the unwinding movements of the reel.

29. In a gathering locomotive, the combination with a motor driven vehicle, and a reel for winding and unwinding an electrical conductor mounted thereon, of power transmitting mechanism interposed between a rotating part on said vehicle and the said reel and including a friction drive, a double threaded shaft arranged parallel to the axis of said reel, power transmitting mechanism connecting said shaft with the reel, a follower on said shaft having a conductor guide thereon, and a friction retarding device for opposing the rotation of said wheel.

30. In a gathering locomotive, the combination with a motor driven vehicle, and a reel for winding and unwinding an electrical conductor mounted thereon, of a double threaded shaft arranged parallel to the axis of said reel, a train of power transmitting devices interposed between said reel and a revolving part on said car and having in said train a friction drive, means for making said train of power transmitting devices active or inactive, power transmitting mechanism connecting said shaft with the reel, a follower on said shaft having a conductor guide thereon, and a friction retarding device for opposing the rotation of said reel.

31. In a gathering locomotive, the combination with a suitable electric locomotive, of a cable reel mounted on the truck of the locomotive, power transmitting mechanism interposed between said cable reel and a motor-driven part on the locomotive including a friction drive the elements of which are normally held in forced engagement with each other through the action of gravity on the mass supported by one of said elements, and means for frictionally resisting the cable unwinding movements of the reel.

32. In a gathering locomotive, the combination with a suitable electric locomotive, of a cable reel mounted on the truck of the locomotive, power transmitting mechanism interposed between said cable reel and a motor-driven part on the locomotive including a friction drive the elements of which are normally held in forced engagement with each other through the action of gravity on the mass supported by one of said elements, and means for frictionally engaging one element of said friction drive to control the cable-unwinding movements of the reel.

33. In a gathering locomotive, the combination with a suitable electric locomotive, of a cable reel mounted on the truck of the locomotive, power transmitting mechanism

interposed between said cable reel and a motor-driven part on the locomotive including a flexible endless chain and a friction drive, the elements of said friction drive being normally held in forced engagement with each other through the action of gravity on the mass supported by one of them, and means for frictionally engaging one element of said friction drive to control the unwinding movements of the said reel.

34. In a gathering locomotive, the combination with a suitable electric locomotive, of a cable reel mounted on the truck of the locomotive, a train of power transmitting devices interposed between a revolving part on the locomotive and the said reel and including a friction drive and positive acting power transmitting devices connecting one element of the said friction drive with the cable reel, and means for making said friction drive operative or inoperative to transmit power from said revolving part, as desired.

35. In a gathering locomotive, the combination with a suitable electric locomotive, of a cable reel mounted on the truck of the locomotive, a train of power transmitting devices interposed between a revolving part on the locomotive and the said reel and including a friction drive and positive acting power transmitting devices connecting one element of the said friction drive with the cable reel, means for making the friction drive operative or inoperative to transmit power for rotating said reel, and a friction-retarding device for controlling the unwinding movements of the reel.

36. In a gathering locomotive, the combination of the locomotive frame, the cable reel rotatably mounted on the frame, a friction wheel having a bearing support movable relative to the frame and the reel, positively acting power-transmitting means interposed between the reel and friction driving wheel, and means for moving said driving wheel into and out of engagement with a relatively moving surface, substantially as set forth.

37. The combination with the vehicle and the cable reel thereon, of the power devices for rotating the reel to wind cable thereon, retarding means for controlling the rotation of said reel during the unwinding of the cable therefrom, the transversely moving cable guide, power devices connecting the reel and the cable guide to drive the latter at a speed proportional to the speed of the reel as the cable is wound or unwound, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK L. SESSIONS.

Witnesses:

GEO. HORST,
A. S. HARTLE.