J. W. KENDRICK.

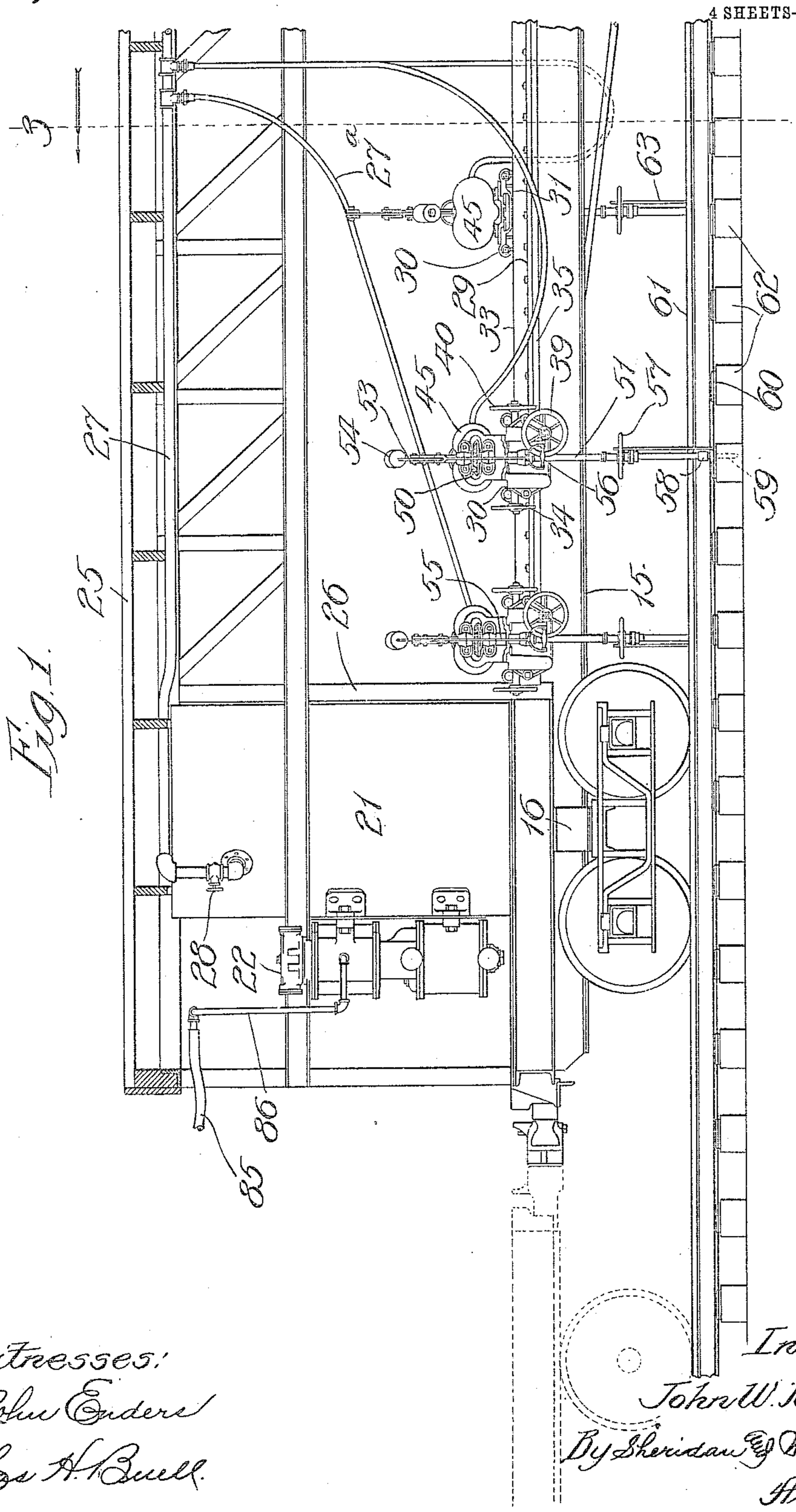
TOOL CAR.

APPLICATION FILED SEPT. 14, 1908.

953,668.

Patented Mar. 29, 1910.

4 SHEETS—SHEET 1.



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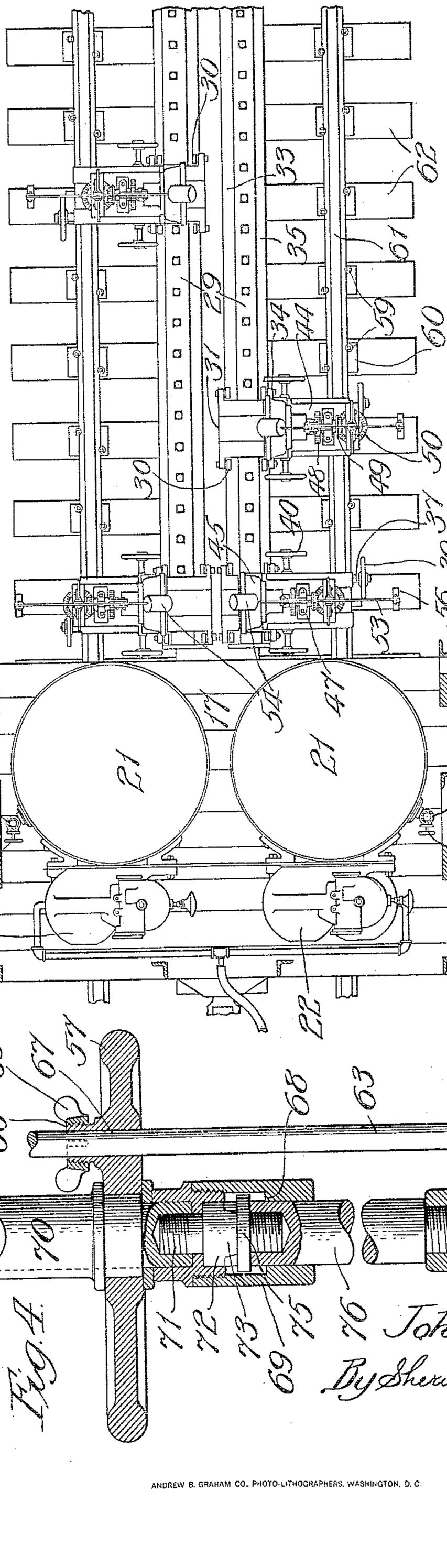

Fig. 2.

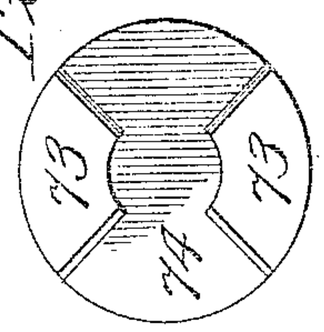

Fig. 3.

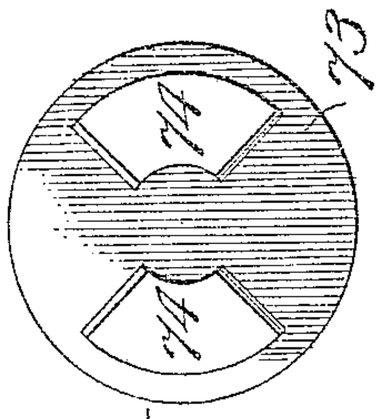

Fig. 5.

Fig. 4.

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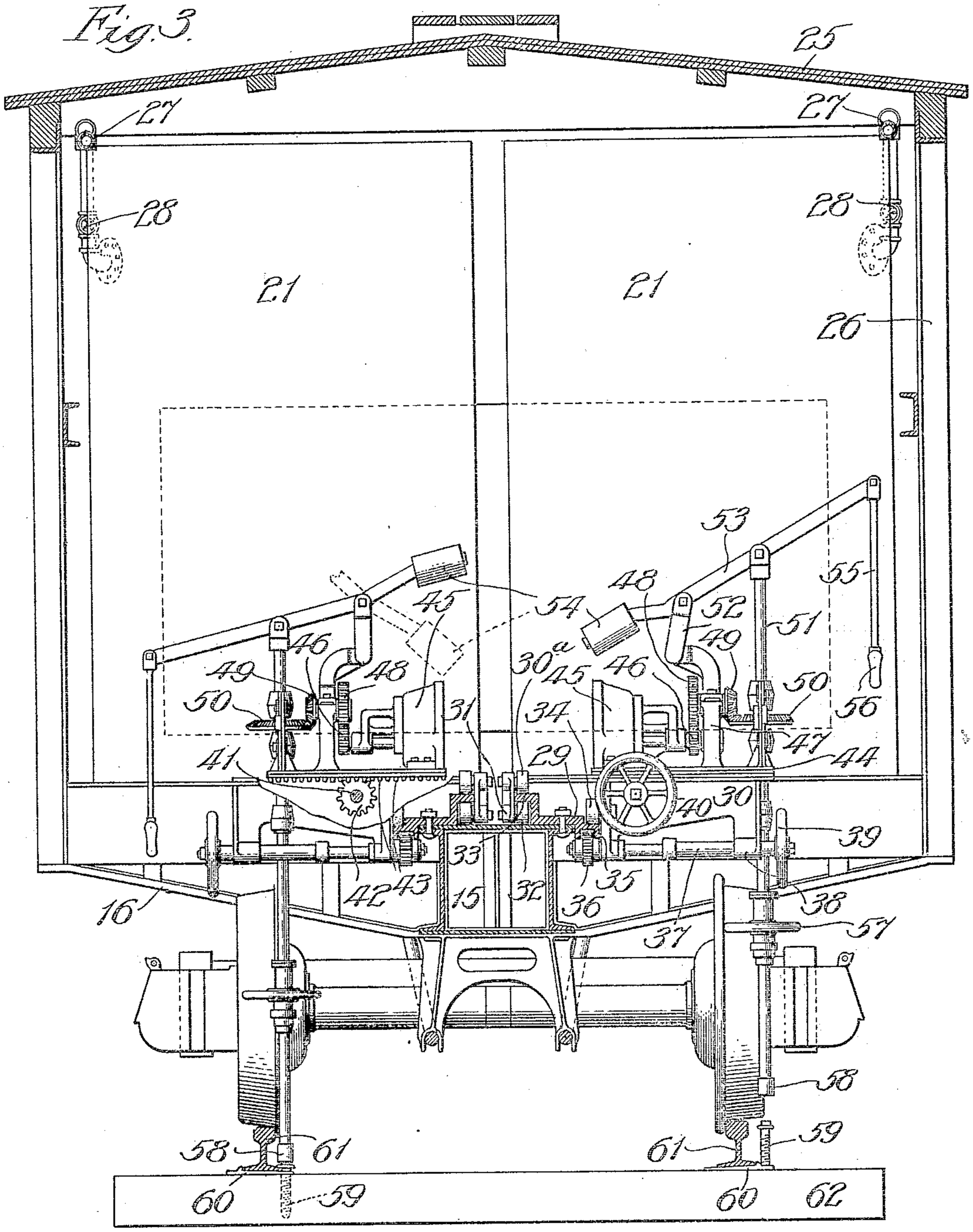
4 SHEETS—SHEET 3.

Fig. 3.



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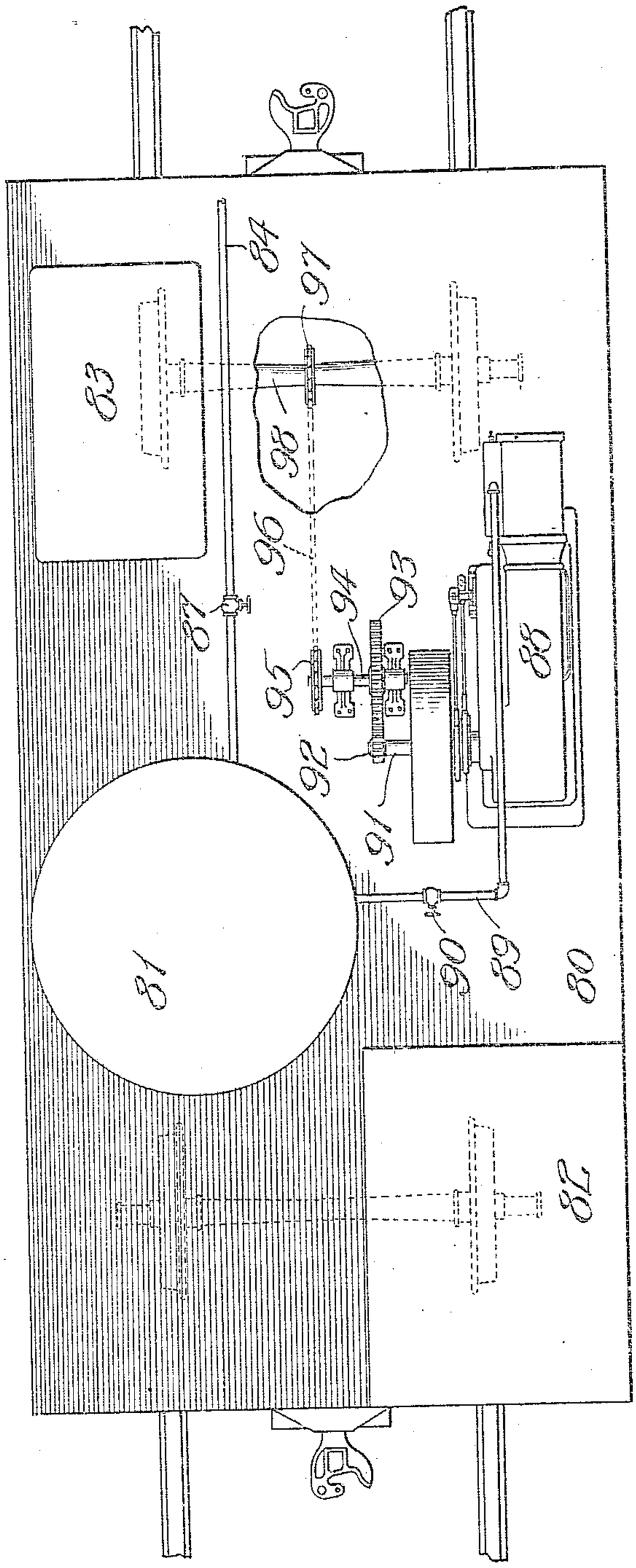
4 SHEETS—SHEET 4.

Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN W. KENDRICK, OF CHICAGO, ILLINOIS.

TOOL-CAR.

953,668. Specification of Letters Patent. Patented Mar. 29, 1910.

Application filed September 14, 1908. Serial No. 452,874.

To all whom it may concern:

Be it known that I, JOHN W. KENDRICK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Tool-Cars, of which the following is a specification.

The object of my invention is to provide apparatus for driving screw spikes in railway ties.

More particularly my object is to provide a car carrying apparatus by which a plurality of screw spikes may be driven simultaneously into the ties beneath the car.

These and other objects will be made apparent in the following specification and claims, when taken in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of a car embodying my invention. Fig. 2 is a top plan view of the same, the roof being removed. Fig. 3 is a cross section of the car, taken on the line 3 of Fig. 1 looking in the direction of the arrow. Fig. 4 is a sectional view of a detail. Fig. 5 is a top plan view of the element designated as 75 in Fig. 4. Fig. 6 is a bottom plan view of the opposed element designated as 72 in Fig. 4. Fig. 7 is a top plan view of a car which is intended to be coupled to the main tool car for the purpose of supplying power thereto and also moving it over the track.

As is well known, the ordinary straight railroad spikes are usually driven by the blows of a hammer actuated manually. One objection to the use of screw spikes is that a great deal of time and effort is required to drive them manually. The wrenches by which the screw spikes are driven by hand usually require two men to operate them, and it is a long slow process to drive a single spike,—requiring several minutes. By my invention screw spikes can be driven with great rapidity by the application of power, and thus an obstacle to their use is overcome.

In the particular form of my invention which I have chosen to illustrate in the drawings a long car is provided having the center sill 15 and the body bolsters 16 above the trucks. At one end of the car a floor 17 is provided above the center sill 15, and on this floor two compressed air tanks 21 are placed. These are supplied with compressed air from the steam-driven compressors 22, which are attached, respectively, to the external side walls of the tanks 21. These air compressors 22 are of any well known type, and therefore need not be described in detail.

Above the car is the roof 25, supported by the side posts 26. Under the roof, on each side, the longitudinal compressed air supply pipes 27 extend the full length of the car from the respective tanks 21, control valves 28 being provided in each pipe. From the supply pipes 27 flexible branch pipes 27^a extend to the pneumatic spike-driving tools, which will be described presently.

Attached to the upper side of the center sill 15 are the two long plates 29, having the cross section shown in Fig. 3. These plates or frames are bolted to the center sill, as shown. Riding on each frame plate 29, and supported thereby, are a plurality of pneumatic spike-driving tools, one of which will now be described in detail.

The bed frame 30 has rollers 30^a at its inner end, which rest upon the inner flange 33 of the frame plate 29. The bed 30 also has an extension 31, which reaches over behind the flange 33 and carries rollers 32 on the under side of said flange. The bed 30 also carries other rollers 34, which rest upon the outermost flange 35 of the frame plate 29. This flange 35 has rack teeth cut on its under side, and a gear pinion 36 engages these rack teeth. This gear pinion 36 is carried at the end of the shaft 37, which is mounted in brackets 38 on the bed 30, and at the end of the shaft 37 is a hand wheel 39 for rotating it. The bed 30 also carries a transverse shaft 41, having a hand wheel 40 at one end and a gear pinion 42 at the other end. This gear pinion 41 engages a rack 43 on the under side of the overlying bed plate 44.

On the upper bed plate 44 is mounted a pneumatic motor 45, which is adapted to rotate the gear pinion 46. A bracket 47, standing on the bed plate 44, carries a shaft with a gear wheel 48 which engages the said gear pinion 46. This shaft also carries a bevel pinion 49, which engages a bevel gear wheel 50 on the vertical shaft 51. This shaft 51 has non-rotative engagement with the bevel gear wheel 50, but is free to slip vertically with relation thereto. A link 52 has one end pivoted to the upper end of the standard 47, and its other end is pivoted to an intermediate point on the lever 53, which has a counterweight 54 at one extremity and at another point is pivotally connected to the upper end of the sliding shaft 51. At

its outer extremity this lever 53 has a handle 56 attached thereto by means of the link 55. Near its lower end the sliding shaft 51 carries a sleeve 70, with a hand wheel 57 thereon. This sleeve 70 is rotatably mounted on the shaft 51, and hence may be employed to raise and lower the sliding shaft 51 or to direct the movements of the same. A stud 71 is screwed into the lower end of the shaft 51, and this has a head 72 with sector-shaped teeth 73 on its lower face. The shaft 76, which hangs directly below the shaft 51 and in line therewith, has a stud with a projecting flange 75 screwed in its upper end. The sleeve 69 screws on the lower end of the shaft 51, and has an inturned flange 68, which engages the flange 75. Sector-shaped teeth 74 project up from the flange head 75 and are adapted to engage the downwardly projecting teeth 73. The teeth 73 and 74 are slightly beveled, and the play afforded the flange 75 within the sleeve 69 is such that these teeth may or may not engage one another. The shaft 76 carries a socket 58 at its lower end, adapted to fit over the head of the screw spike 59.

The stem 63 projects through a hole 67 in the hand wheel 57. On its upper side the hole 68 is bounded by a split tapered threaded sleeve 66. The correspondingly threaded wing nut 65 engages the sleeve 66.

A small car, shown in Fig. 7, is provided to carry a steam generator for the air compressors 22, and also to carry a steam motor for moving the tool car. On a platform 80 stands a steam boiler 81. The fuel box 82 and the water tank 83 also stand on this platform. A steam supply pipe 84 leads from the boiler 81 and connects by a section of flexible tubing 85 to the branch pipes 86, which lead to the air compressors 22. A valve 87 is provided in the steam pipe 84.

A reciprocating steam engine 88 stands on the floor 80, being supplied with steam through the valve 90 by means of the steam pipe 89. The crank shaft 91 of this engine carries a gear pinion 92, which engages a large gear wheel 93 on the countershaft 94. This countershaft carries a sprocket wheel 95, from which a chain 96 transmits the power to a sprocket wheel 97 on the axle 98.

When in use the tool car shown in Fig. 1 and the auxiliary car shown in Fig. 7 are coupled together. By means of the engine 88 the auxiliary car acts as a motor car to move the tool car from one place to another as may be necessary. The steam generator 81 supplies steam through the pipe 84 to the steam cylinders of the air compressors 22, and these air compressors compress a supply of air in the tanks 21. Then when the tool car shown in Fig. 1 has been moved over a section of the track in which spikes are to be driven, the pneumatic tools employed on the center sill 15 are moved by operators to the exact positions required for driving the spikes. Rotation of the hand wheel 39 moves the tools longitudinally, and then a transverse adjustment may be secured by means of the hand wheels 40. Through the driving connections that have been described the pneumatic tool 45 causes the sliding shaft 51 to rotate. Normally the counterweight 54 holds this shaft up, and at such time the flanged head 75 on the lower shaft 76 drops to the bottom of the sleeve 69, and thus the teeth 73 and 74 do not engage each other. But when it is desired to drive a spike 59, the shaft 51 is pulled down by means of the handle 56, causing the socket 58 to engage the head of the spike 59, and also causing the teeth 73 and 74 to interlock. When the spike is driven home, if the operator fails to disconnect the socket 58 therefrom, the stem 63 will strike upon the tie or the tie plate. This will prevent the shaft 51 from descending, and will thus cause the interlocking teeth 73 and 74 to separate slightly. For the reason that they are beveled, they will slip entirely apart the moment they are started apart. Thus the driving shaft 51 will be disconnected from the spike 59, and there will be no danger of loosening the spike in the hole in the tie.

After driving the spike the operator can quickly shift the machine by means of the hand wheels 39 and 40 to drive another spike. Thus, in a few minutes all the spikes can be driven under the entire length of the tool car. Then steam can be turned into the engine 88 on the auxiliary car, and the tool car can be moved by its own length to an adjoining section of the track, where the spikes can be driven in the same manner.

It is obvious that instead of transmitting the power by compressed air I could provide a single mechanical motor with shafts and belts to communicate the power therefrom to the several spike-driving tools. It is also obvious that the steam generator and other elements and apparatus mounted on the auxiliary car could, if preferred, be mounted on the main tool car. All these variations, and others, are comprehended within my invention in its broader aspect.

It may be desirable in certain cases to employ several spike driving tool cars coupled together in series and supplied with steam from a single boiler. For example, an ordinary locomotive could be substituted for the auxiliary car illustrated in Fig. 7 and this locomotive could perform the two functions of supplying steam to the air compressors on the tool cars and acting as a motor car to move the tool cars from place to place.

I claim:—

1. In a device of the class described, a car comprising a longitudinal frame, rotary

screw-spike-driving tools movably mounted on said frame, a source of energy associated with said car, and means to communicate the energy to the respective tools.

2. In a device of the class described, a car comprising a longitudinal frame, spike-driving tools movably mounted on said frame, pneumatic motors to actuate the several tools, a compressed air tank mounted on the car, and pipes leading therefrom to the said motors.

3. In a device of the class described, a car comprising a center sill, laterally projecting frames mounted to slide along said sill, spike-driving tools mounted on said frames, a source of energy associated with said car, and means to communicate energy to the respective tools.

4. In a device of the class described, a car comprising a center sill, laterally projecting frames mounted to slide along said center sill, movable spike-driving tools carried on the respective frames, a motor associated with each tool, and means to supply energy to actuate the motors.

5. In a device of the class described, a car comprising a longitudinal frame, spike-driving tools mounted to slide longitudinally along said frame, said tools being also adjustable transversely to the frame, a source of energy associated with said car, and means to communicate the energy to the respective tools.

6. In a device of the class described, a car comprising a longitudinal frame, a spike-driving tool movably supported on said frame, a pneumatic motor associated with said tool, a compressed air tank at one end of the car, a supply pipe extending therefrom along the length of the car, and a flexible branch pipe therefrom to the motor.

7. In a device of the class described, a car and a spike-driving machine movably mounted thereon, said machine comprising a vertical shaft adapted to be moved up and down by the operator, and a vertical guide for the shaft, said guide being fixed relatively to the machine, a motor, and gearing from the motor to rotate the shaft.

8. In a device of the class described, a car and a spike-driving machine movably mounted thereon, said machine comprising a bed plate, a motor thereon, a vertical shaft adapted to slide longitudinally with reference to the bed plate, means at the lower end of the shaft to engage a spike, and gearing from the motor to the said shaft.

9. In a device of the class described, a car, spike-driving machines movably mounted thereon, a steam generator, an air compressor, an air tank, pneumatic motors associated with the respective spike-driving tools, and means to supply air from said tank to said motors.

10. In a device of the class described, a car, spike-driving tools movably mounted thereon, a steam generator, a steam engine adapted to move the car along the track, a steam-driven air compressor, an air tank supplied thereby, pneumatic motors associated with the respective spike-driving tools, and pipes from the air tank to the said motors.

11. In a spike-driving machine, a motor, a vertical shaft adapted to slide longitudinally, connections from the motor to rotate said shaft, another shaft in alinement therewith at the lower end, a socket to engage a spike at the lower end of the last named shaft, and clutch members adapted to connect the opposed ends of the two shafts.

12. In a spike-driving machine, a vertical driving shaft adapted to slide vertically, means to rotate said shaft, a loose sleeve on said shaft, a handle attached to said sleeve, a tool-engaging shaft in alinement with the first named shaft, and clutch means connecting the two shafts.

13. In a spike-driving machine, a movable bed plate, a shaft adapted to slide vertically with relation thereto, means on the bed plate to rotate the shaft, means to normally raise the shaft, hand-actuated means to depress the shaft, a member at the lower end of said shaft adapted to engage a spike, and interlocking means between the said shaft and the said member.

14. In a spike-driving machine, a movable bed plate, a vertical shaft adapted to slide longitudinally, means to rotate said shaft, clutch teeth at the lower end thereof, an alining shaft below the first named shaft with opposed clutch teeth on its upper end, and a coupling sleeve for the two shafts permitting them to lock or unlock with one another.

15. In a spike-driving machine, two alining vertical shafts with opposed interlocking clutch members, a sleeve on the upper shaft, a socket adapted to engage a spike on the lower end of the lower shaft, and a stem attached to the sleeve and adapted to act as a stop to disengage the clutch.

16. In a device of the class described, a plurality of cars each comprising a longitudinal frame, rotary screw-spike driving tools movably mounted on each frame, a source of energy associated with said cars, and means to communicate the energy to the respective tools.

17. In a device of the class described, a plurality of cars each comprising a longitudinal frame, spike driving tools movably mounted on said frames, means for storing energy on each car, an auxiliary motor car, and means on the motor car for generating energy to be delivered to the storage means on the respective tool cars.

18. In a device of the class described, a

railway car, a rotary screw spike driving tool, connections between the car and the said tool such as to permit displacement of the tool relatively to the car, but to prevent any angular movement of the tool with respect to the car, a source of energy associated with said car, and means to communicate the energy to the said tool.

19. In a device of the class described, a railway car, a rotary screw spike driving tool associated with said car, connections between the car and the tool constraining the latter to restricted movement relatively to the car and preventing angular movement with respect thereto, a source of energy associated with said car, and means to communicate the energy to the tool.

20. In a spike driving machine, a motor, a member adapted to rotate on a vertical axis, said member having at its lower end a socket to engage the head of a screw spike and drive the same into a tie lying on the ground, connections from the motor to rotate said member, and means to break said connections when the screw spike is driven to a certain limit by the rotaton of said member.

21. In a spike driving machine, a motor, a member adapted to rotate about a vertical axis and having a socket in its lower end to engage the head of a screw spike and drive the same into a tie lying on the ground, driving connections from the motor to rotate said member, a stop carried by the member and adapted to come in contact with some part fixed relatively to the tie, means to check the said member from being rotated by the motor, and connections from the stop to actuate said means.

22. In a spike driving machine, a motor, a member adapted to rotate about a vertical axis and having a socket at its lower end adapted to engage the head of a screw spike and drive the same into a tie lying on the ground, driving connections from the motor to rotate the said member, and means to stop the rotation of said member when the spike has been driven to a certain limit in the tie.

In testimony whereof, I have subscribed my name.

JOHN W. KENDRICK.

Witnesses:
P. M. KUNN,
F. H. APPLETON.