947,180.

W. E. JEWELL.

CHARGING TRUCK FOR FURNACES.

APPLICATION FILED NOV. 25, 1908.

Patented Jan. 18, 1910.

3 SHEETS—SHEET 1.

Fig. 1.

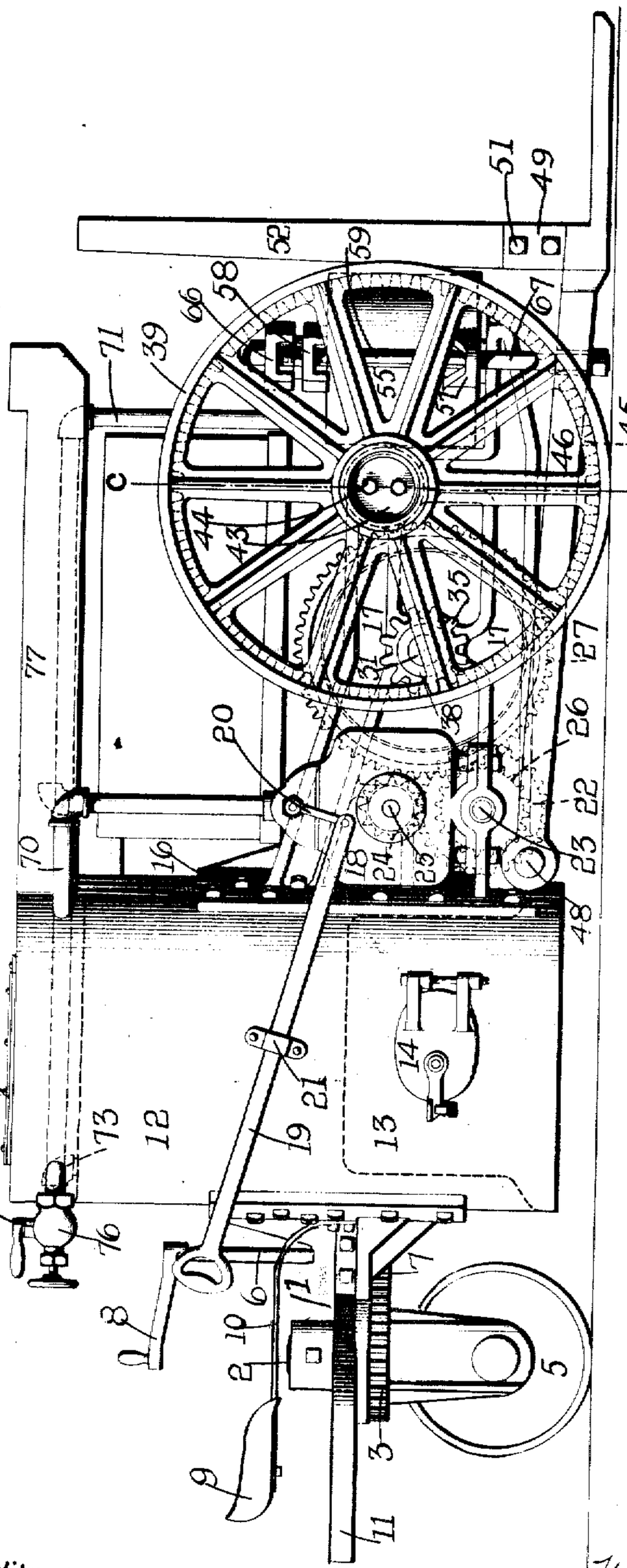
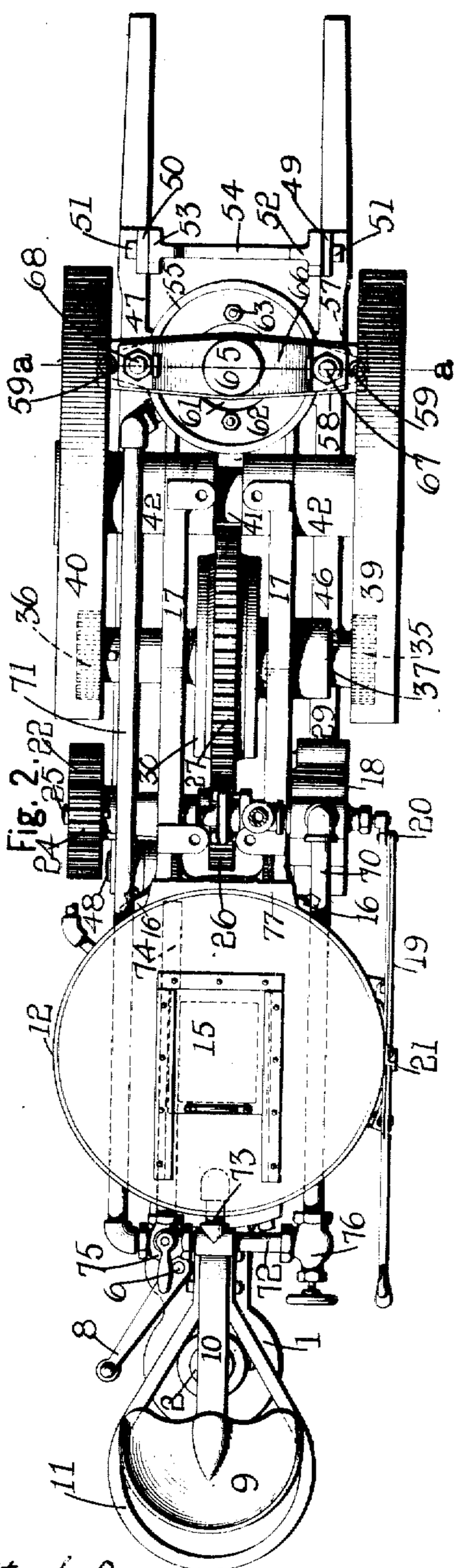


Fig. 2.



Witnesses.

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3 SHEETS—SHEET 2.

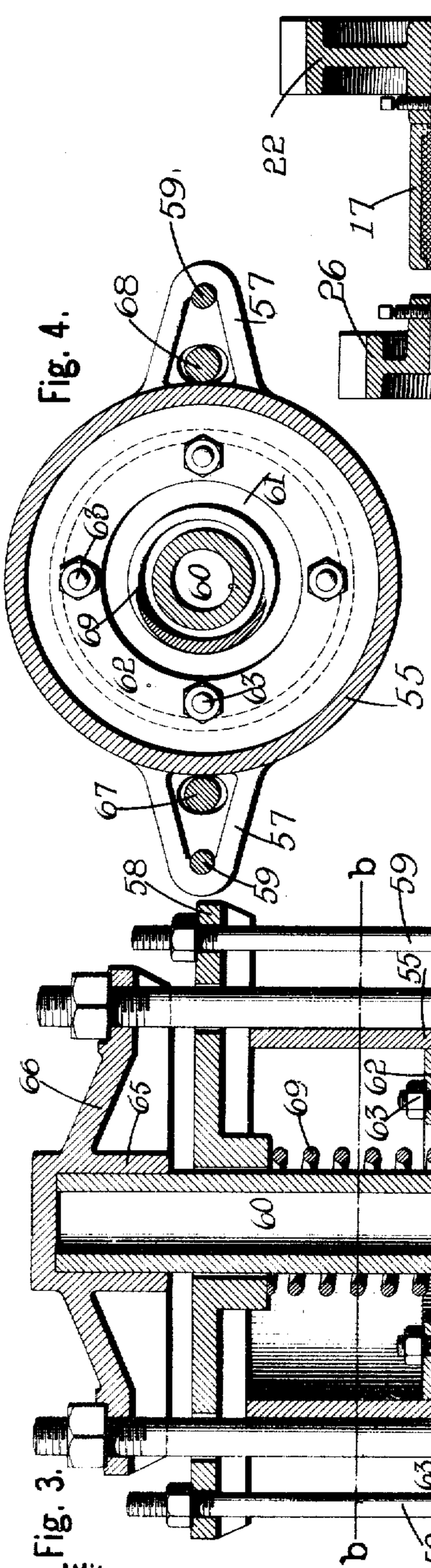

Fig. 4.

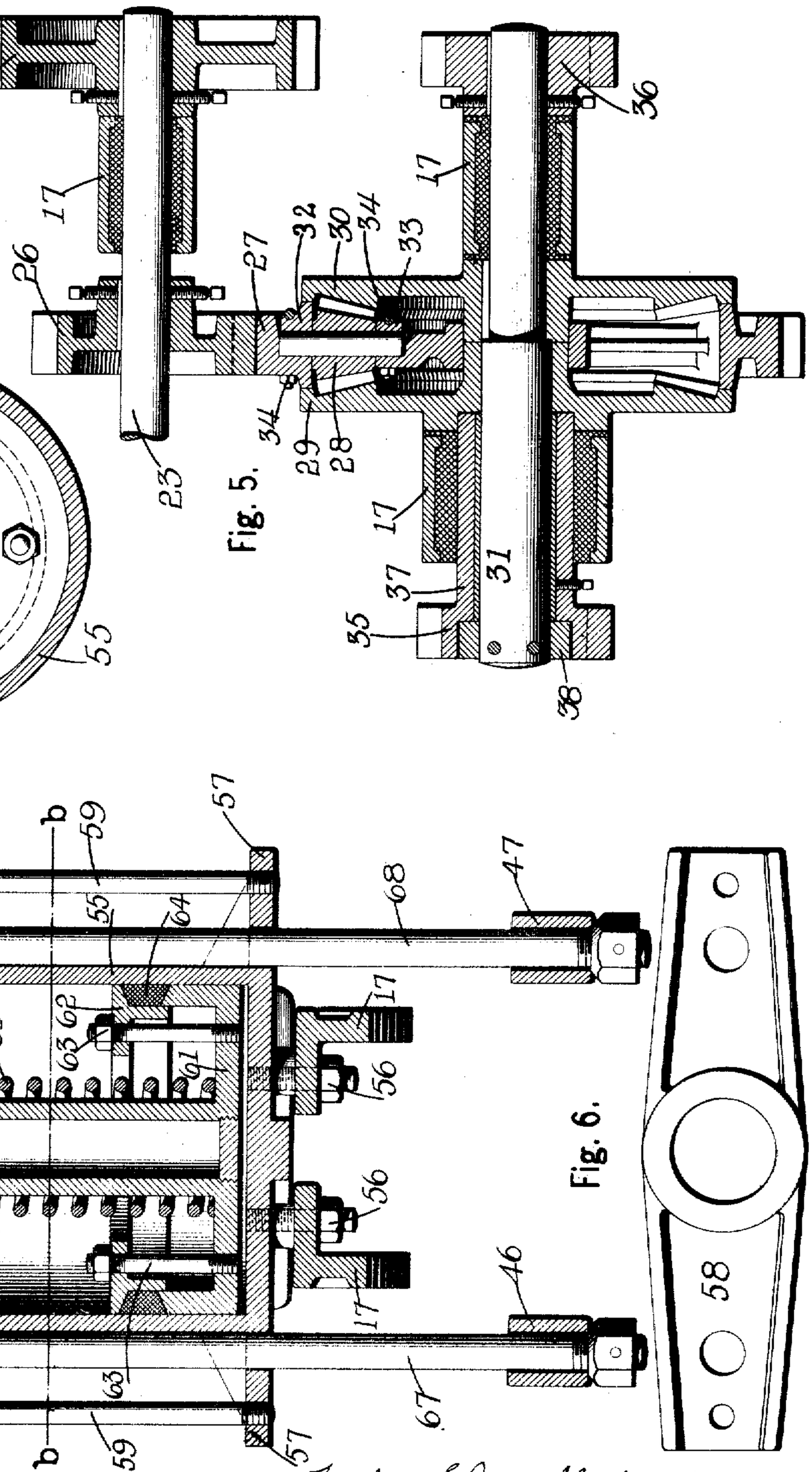

Fig. 5.

Fig. 6.

Fig. 3.

Witnesses.

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3 SHEETS—SHEET 3.

Fig. 7.

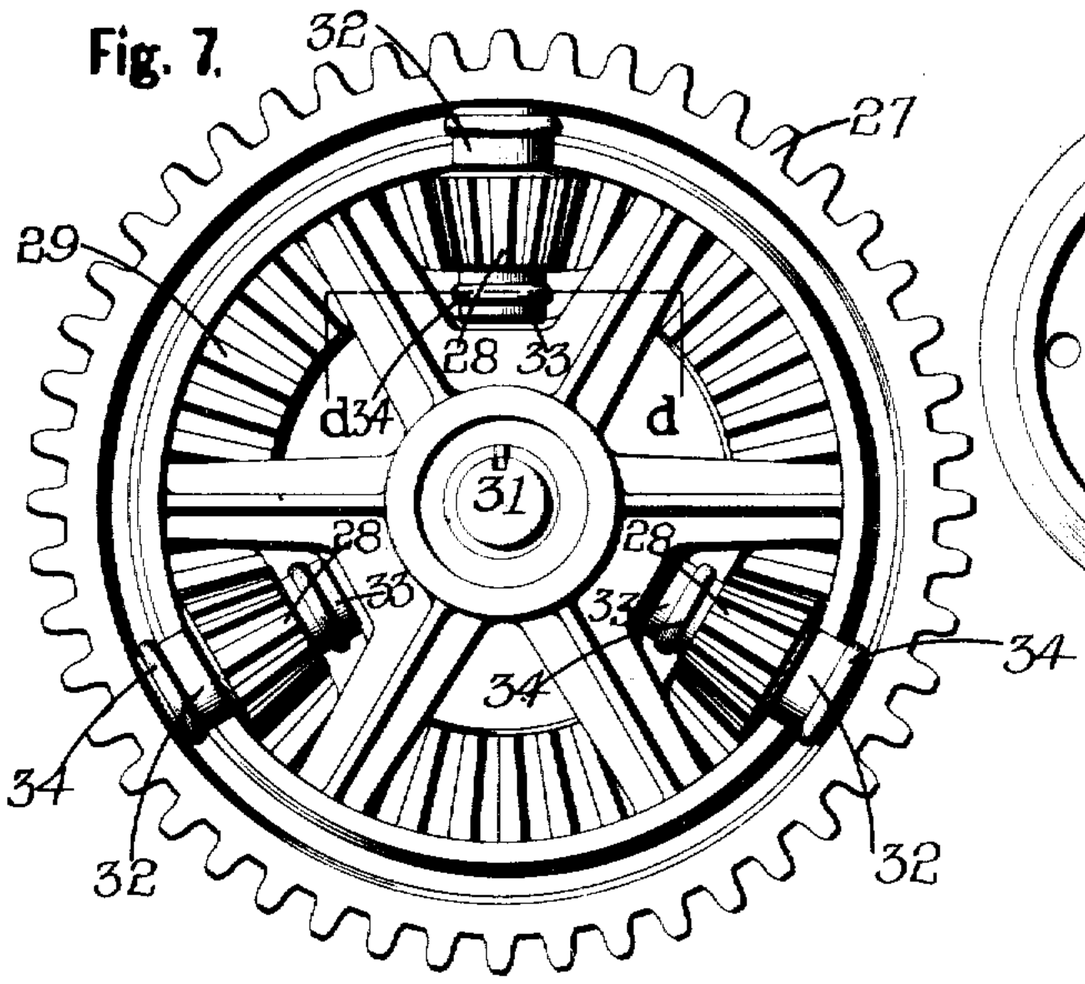


Fig. 8.

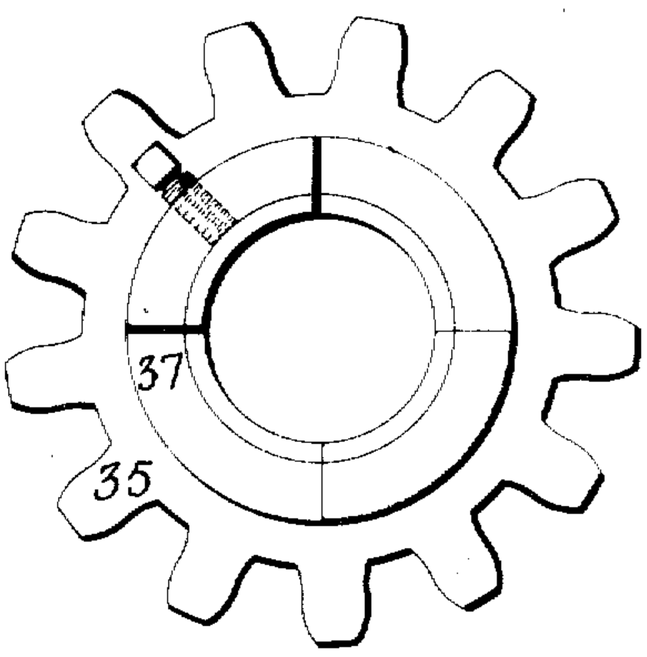


Fig. 9.

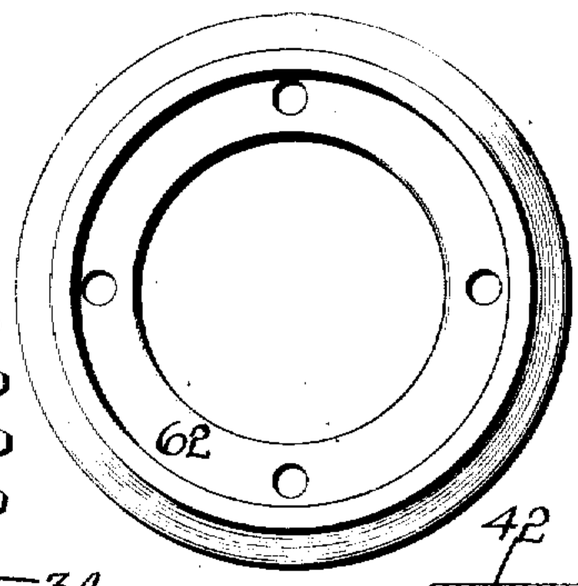


Fig. 10.

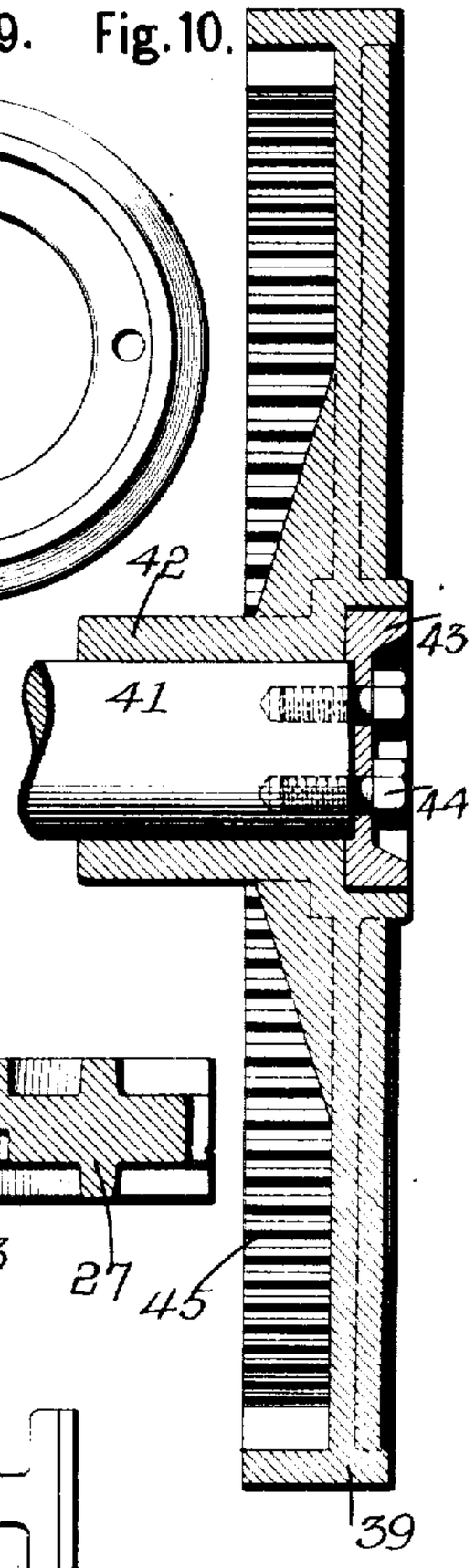


Fig. 11.

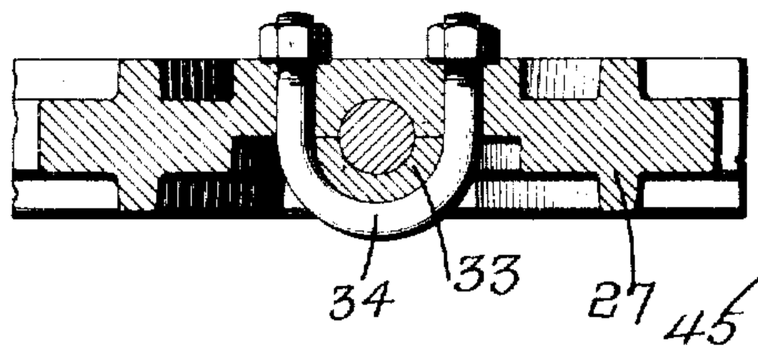


Fig. 12.

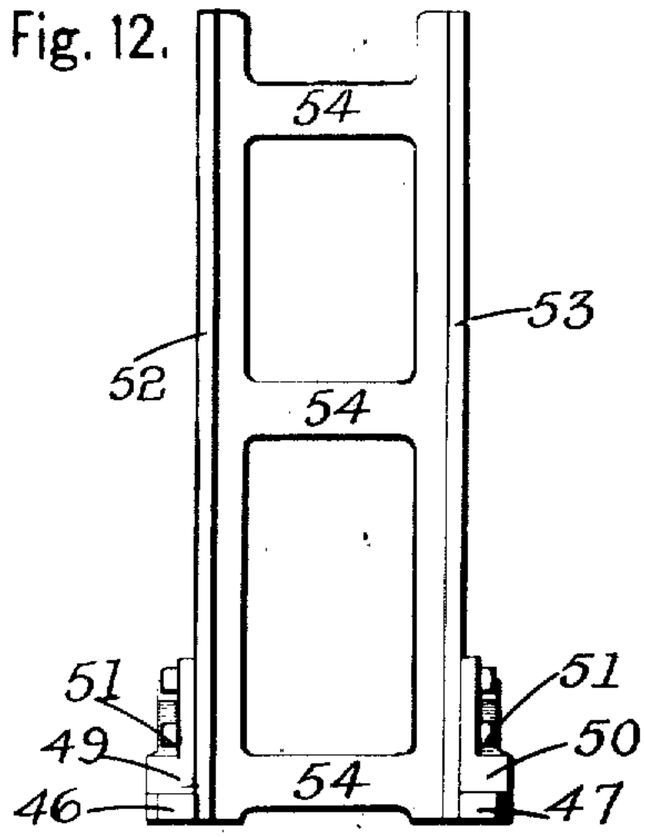
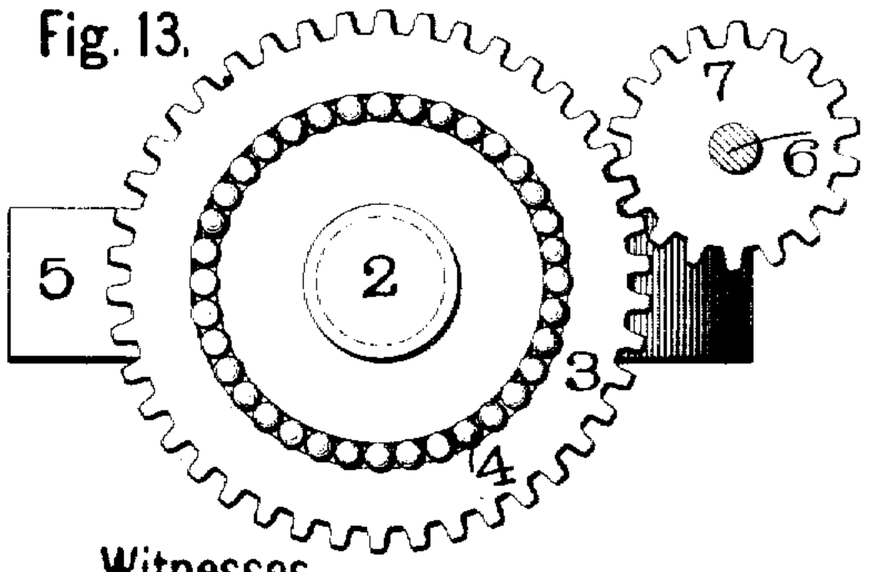


Fig. 13.



Witnesses.

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UNITED STATES PATENT OFFICE.

WALTER E. JEWELL, OF BUFFALO, NEW YORK.

CHARGING-TRUCK FOR FURNACES.

947,180. Specification of Letters Patent. Patented Jan. 18, 1910.

Application filed November 25, 1908. Serial No. 464,454.

To all whom it may concern:

Be it known that I, WALTER E. JEWELL, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a certain new and useful Improvement in Charging-Trucks for Furnaces, of which the following is a specification.

This invention relates to a charging machine which is principally adapted for carrying boxes to or from annealing ovens.

The object of the invention is to provide a very simple machine capable of traveling and operating under its own power and in which the lifting mechanism is movable independently of the balance of the machine.

The invention also relates to certain details of construction, which will be hereinafter described and claimed reference being had to the accompanying drawings in which a preferred adaptation of the machine is shown.

Figure 1 is a side elevation of the machine complete. Fig. 2 is a top plan view of the machine complete. Fig. 3 is an enlarged detached central vertical section on line *a a*, Fig. 2 through the lifting cylinder. Fig. 4 is a horizontal section on line *b b*, Fig. 3. Fig. 5 is an enlarged detached central section through the differential mechanism and the connecting gearing, the supporting shafts being shown in side elevation. Fig. 6 is a detached bottom view of the top supporting bar of the lifting cylinder. Fig. 7 is an interior view of the differential gearing. Fig. 8 is a detached view of the clutch gear. Fig. 9 is the upper annular member of the piston of the lifting cylinder. Fig. 10 is a central section through one of the driving wheels. Fig. 11 is a fragmentary section through the differential gearing on line *d d*, Fig. 7. Fig. 12 is a detached front view of the lifting frame. Fig. 13 is a detached top view of the rear traction wheel and its operating gear.

In referring to the preferred adaptation of the machine shown in the drawings in detail like numerals designate like parts.

The machine briefly consists of a rear steering section, an intermediate boiler section and a forward driving and lifting section.

The steering section consists of a frame 1 which is riveted to the rear side of the intermediate boiler and extends rearwardly therefrom, a vertical shaft 2 journaled in said frame and carrying a horizontal gear wheel 3 near its upper end which is journaled on ball bearings 4 as shown in Fig. 13, and a vertical traction wheel 5 at its lower end and a steering column 6 having a pinion 7 at its lower end which meshes with the gear wheel 3 and a steering handle 8 at its upper end.

A seat 9 is arranged over the frame 1 being mounted at the rear end of a spring member 10 which is attached at its front extremity to the front portion of the frame 1 and bends rearwardly, see Fig. 1.

A guard consisting of a metal loop 11 is fastened at its front ends to the frame 1 and bends rearwardly to form a protecting element extending behind the rear extremity of the seat 9.

The boiler section consists of an upright cylindrical shell 12 having a furnace portion 13 at the bottom. The furnace portion 13 has the usual door 14 and a slide door 15 is arranged in the top of the boiler to constitute a damper.

The driving and lifting mechanisms are located forward of the furnace section and are both operated by steam supplied from the boiler. The driving mechanism and lifting mechanism are independent of each other and are operated and controlled separately. The frame of the driving and lifting mechanisms is of skeleton form consisting of two vertical plates 16 which are riveted to the front side of the boiler section and frame members 17 which extend forward from the plate. A steam engine 18 of any well known form is mounted in the frame members 17 and has the usual reversing mechanism which is operated by a hand lever 19 extending rearwardly from a crank 20 on the valve rock shaft. The lever 19 is slidably supported by a cleat 21 attached to the boiler section, see Fig. 1. A large gear wheel 22 on a counter shaft 23 meshes with a gear wheel 24 on the engine shaft 25 and an annular gear wheel 26 on the counter shaft 23 meshes with the large master spur gear wheel 27 of a differential mechanism. The form of differential mechanism preferably employed is shown in Figs. 5 and 7 consisting of the master gear wheel 27 previously described, a plurality of planet pinions 28 journaled on radial shafts which are supported by the master gear wheel and two opposed beveled gear wheels 29 and 30 which mesh with opposite sides of and in-

close the planet pinions. A differential shaft 31 is journaled in the forward frame and the hubs of the two beveled gear wheels are supported thereon, one being unrotatably fastened on said shaft and the other being loosely journaled thereon so as to rotate independently. The shafts of the pinions are journaled in two part bearings 32 and 33 which are secured together by a U-shaped bolt 34 as shown in Fig. 11. Spur gear wheels 35 and 36 are supported on the shaft 31 the gear wheel 35 being mounted on a sleeve 37 which in turn is fastened to the bevel gear wheel 29 and the gear wheel 36 being fastened directly to the shaft 31 by set screws and a key in the well known way. The gear wheel 35 and its supporting sleeve 37 are rotatably mounted on the shaft 31, and are locked against removal by a collar 38 pinned to the shaft, see Fig. 5.

The forward supporting wheels 39 and 40 of the machine are journaled at opposite ends of a stationary transverse shaft 41 which is mounted in the forward frame members. These wheels are provided with comparatively long inwardly extending sleeves 42 which form hubs having wide bearing surfaces and are secured in place by end plates 43 which fit in recesses in the outer surface of the wheel and are fastened to the shaft by bolts 44 or other fastenings. The supporting wheels are each provided with an internal gear 45 connected to the opposed bevel gear wheels of the differential mechanism, see Figs. 1 and 10.

The lifting mechanism consists of a lifting frame and means for raising or lowering the lifting frame. The lifting frame is of skeleton form having two side members 46 and 47 which are pivoted on pivot pins 48 at their rear ends to the frame of the driving and lifting section at points slightly in front of the boiler section and extend forward in front of the forward supporting wheel, projecting sufficiently to provide means for carrying a load of annealing boxes. The members 46 and 47 are not separated as much as the supporting wheels and extend within and between the wheels. Just in front of the supporting wheels the members 46 and 47 are provided with short vertical extensions 49 and 50 to which the lower end of a vertical back or support is firmly secured by bolts 51. The construction of the vertical back is shown in Fig. 12 consisting of two vertical bars 52 and 53 connected by horizontal cross bars 54. The lifting frame is raised by means of a steam cylinder the piston of the cylinder being connected to the lifting frame. A detail cut of the steam cylinder is shown in Fig. 3 in which the cylinder 55, is fastened at the bottom to the forward frame by a screw 56 and is provided with side flanges 57 to which a top supporting bar 58 is fastened by vertical screw bolts 59. The piston is of peculiar form consisting of a tubular stem 60 having a head 61 at its lower end, an upper ring like member 62 above the head and adjustably secured to the head by bolts 63 and a piston ring 64 between the head 61 and the ring like member 62. The surfaces of the ring like member 62 and the head 61 between which the piston ring 64 is located are beveled so as to diverge outwardly so that tightening the bolts 63 will force the piston ring outwardly against the inner surface of the cylinder thereby providing adjustment to take up wear. The upper end of the tubular stem is fitted in a middle socket or hub 65 in a bar 66. This bar 66 is connected to the side members 46 and 47 of the lifting frame by vertical connecting rods 67 and 68 so that elevation of the piston in the cylinder will correspondingly raise the lifting frame. A compression spring 69 is arranged between the head 61 of the piston and the top supporting bar 58 which is compressed by the upward movement of the piston and serves to force the piston down and lower the lifting mechanism when the steam pressure within the cylinder is sufficiently diminished.

The driving mechanism and the lifting mechanism are connected respectively to the boiler by independent steam pipes 70 and 71 and the rear ends of these pipes are connected by a transverse connecting pipe 72 which in turn connects to a common feed pipe 73 extending from the boiler and shown partially in full and partially in dotted lines in Fig. 2. An exhaust pipe 74 also extends from the connecting pipe 72 to within a smoke stack 77 as shown in dotted lines in Fig. 2, and a three-way cock 75 is located in the connecting pipe at its juncture with the exhaust pipe. By employing a three way cock, steam can be admitted to the pipe 71 and conducted to the lifting cylinder by said pipe to raise the piston upon turning the cock one way and then the pipe 71 can be shut off from the boiler and brought into communication with the exhaust pipe 74 to exhaust the steam in the lifting cylinder and permit the piston to lower. A throttle valve 76 is located at the rear end of the pipe 70 at its juncture with the connecting pipe 72 and controls the admission of steam to the engine.

It will be noted by referring to Figs. 1 and 2 that the throttle valve 76, three way cock 75, steering handle 8 and engine controlling lever 19 are all arranged within convenient reach of an operator seated on the steering section.

One of the great advantages of this machine resides in its simplicity and the strength and rigidity of its construction as the boiler section in fact forms a portion of the frame of the machine connecting the front driving

and lifting section and rear steering section. Other advantages are in the separate and independent operation of the driving mechanism and the lifting mechanism, the ease and convenience with which it can be operated and controlled and the fact that the movable frame of the lifting mechanism is comparatively light and is movable independently of the main portion of the machine.

While this improved machine is principally adapted for conveying annealing pots, it may also be utilized with but slight alterations as a shop or foundry power operated machine for transporting heavy articles to various parts of a shop or foundry.

I claim—

1. In a machine of the character described, the combination with a boiler section, of a rear steering section having a frame provided with a vertical portion riveted directly to the rear side of the boiler section and a front section having independent driving and lifting mechanisms and a frame having a vertical portion riveted directly to the front side of the boiler section.

2. In a machine of the class described, the combination with the machine frame, of a lifting frame pivoted at its rear end to the machine frame and extending in front of the machine frame, a steam cylinder mounted on the machine frame, a piston in said cylinder having a piston head and a stem, a cross bar on the stem and rods connecting the cross bar to the lifting frame.

3. In a machine of the class described, the combination with the machine frame, of a lifting frame pivoted at its rear end to the machine frame and extending in front of the machine frame, a steam cylinder mounted on the machine frame, a piston in said cylinder having a piston head and a stem, rods connecting the piston stem to the lifting frame, a supporting bar and a spring between the piston head and the supporting bar adapted to return the piston and lifting machine to their lower position when the steam pressure is diminished sufficiently.

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