No. 704,020. Patented July 8, 1902.

L. A. & C. I. FREEDMAN.

SYSTEM OF TRAIN MANIPULATION.

(Application filed Mar. 1, 1902.)

(No Model.) 5 Sheets—Sheet I.

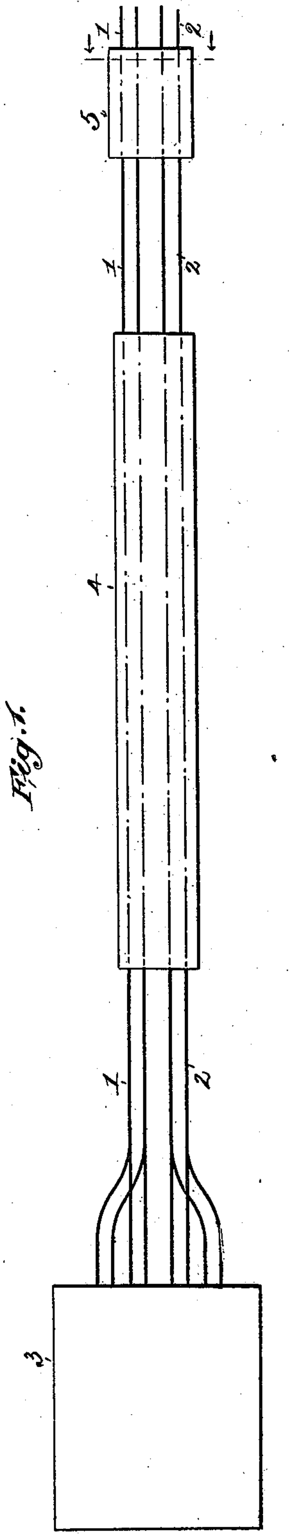

Fig. 1.

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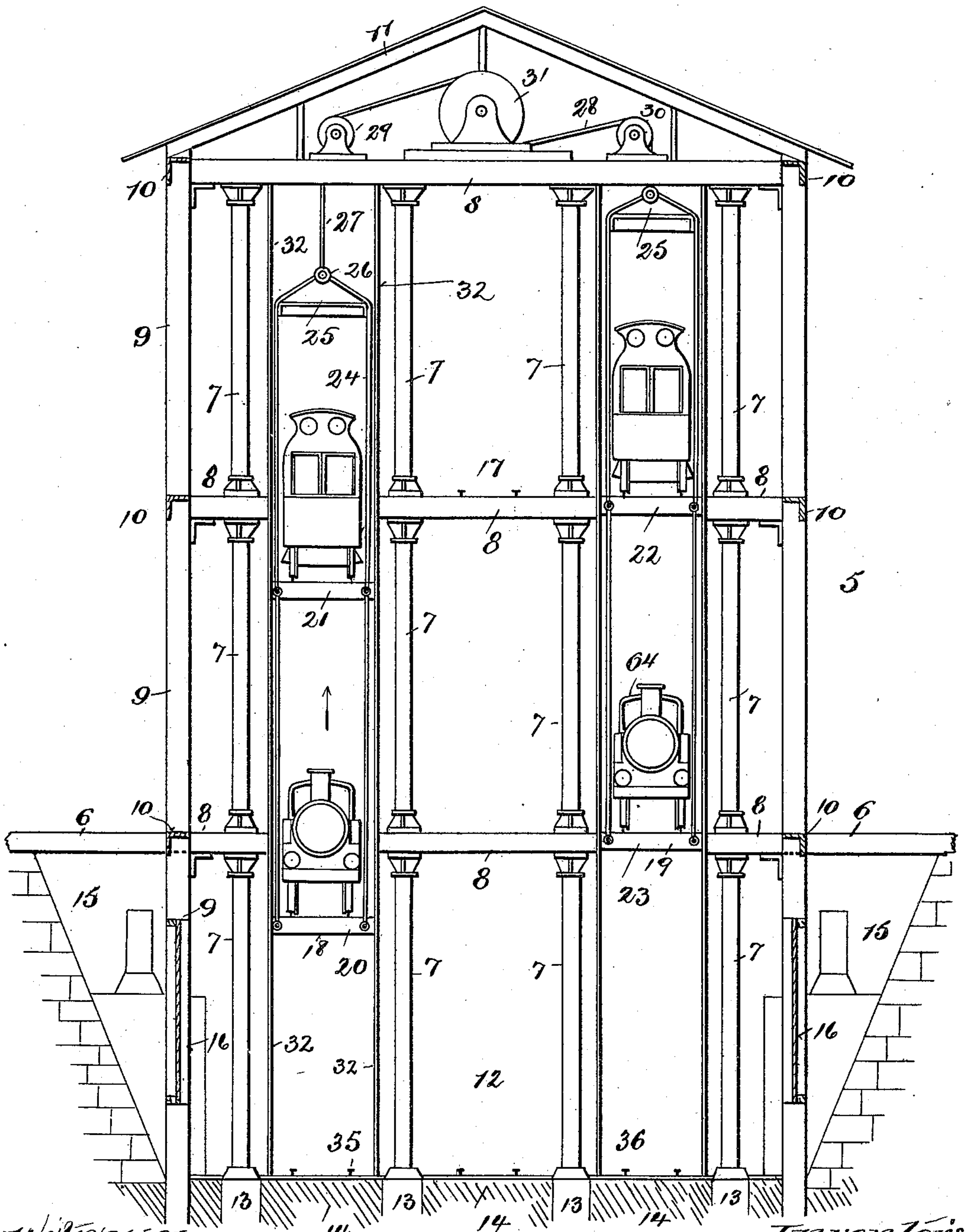

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Fig. 2.

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(No Model.) **5 Sheets—Sheet 3.**

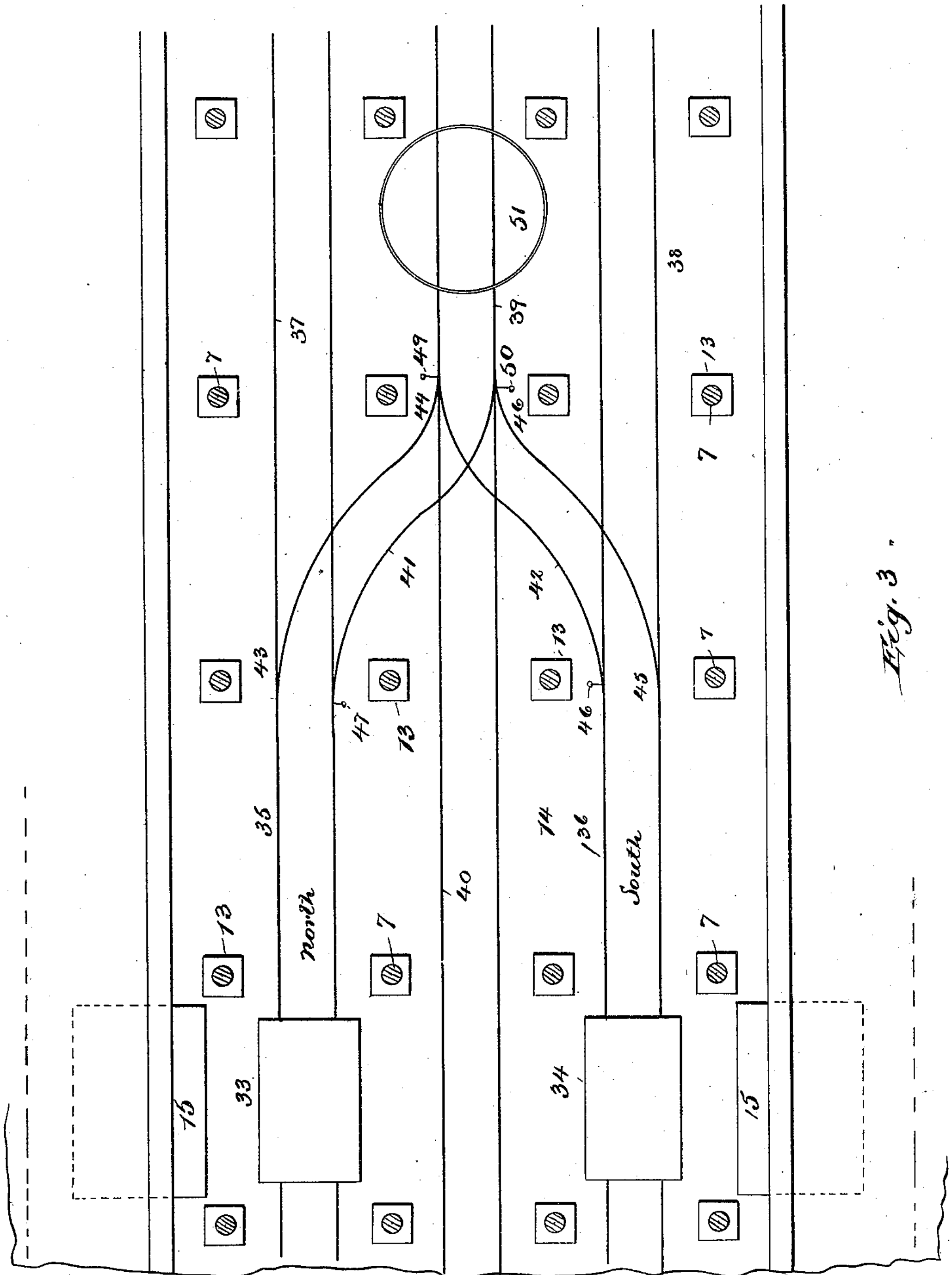

Fig. 3.

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(No Model.)

5 Sheets—Sheet 4.

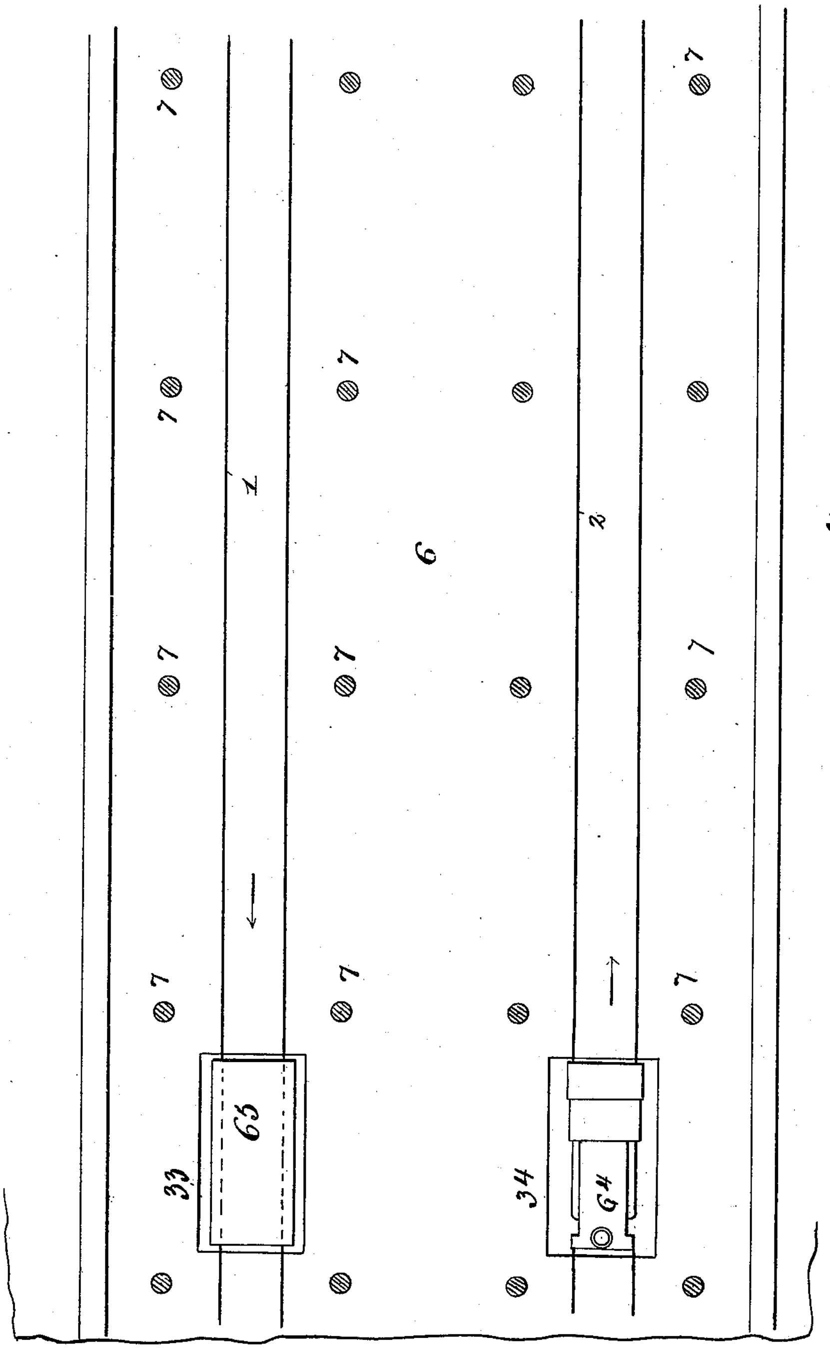

Fig. 4.

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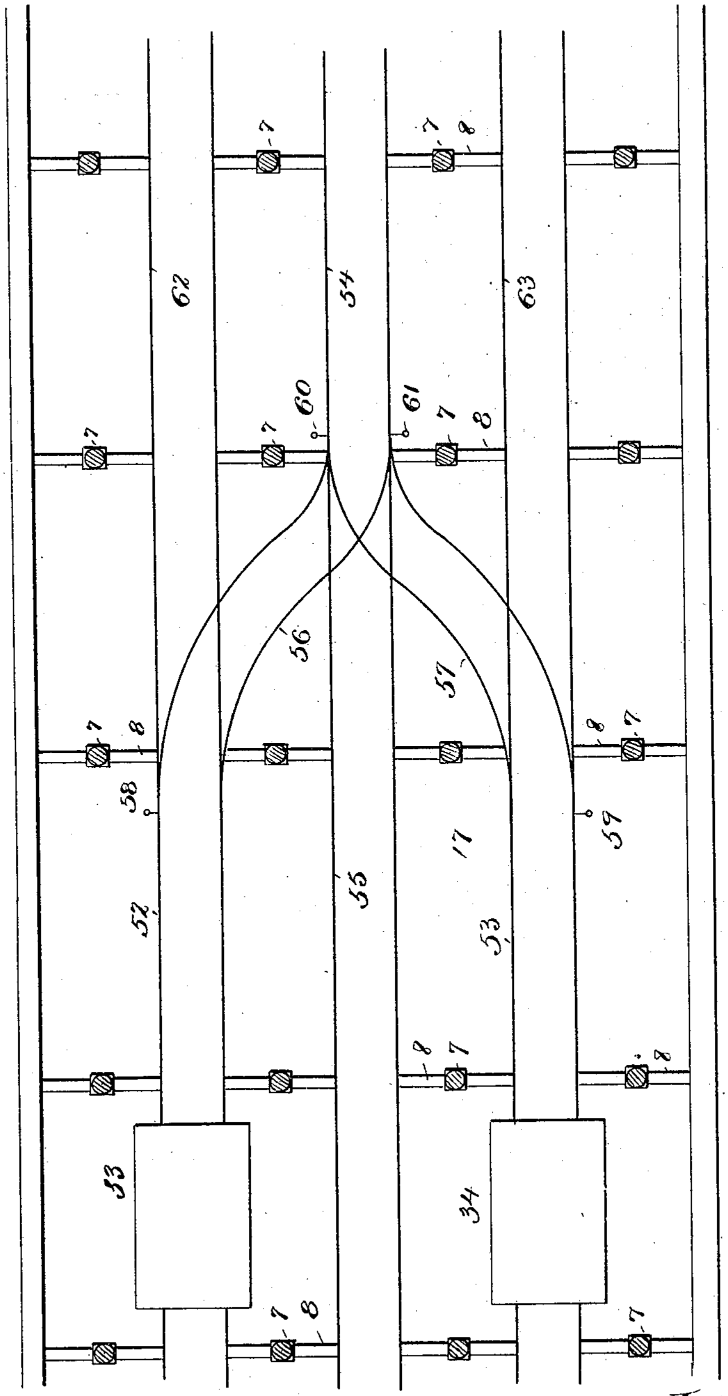

Fig. 5.

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UNITED STATES PATENT OFFICE.

LOUIS A. FREEDMAN AND CHARLES I. FREEDMAN, OF NEW YORK, N. Y.

SYSTEM OF TRAIN MANIPULATION.

SPECIFICATION forming part of Letters Patent No. 704,020, dated July 8, 1902.

Application filed March 1, 1902. Serial No. 96,231. (No model.)

To all whom it may concern:

Be it known that we, LOUIS A. FREEDMAN and CHARLES I. FREEDMAN, citizens of the United States, residing at the city of New York, borough of Manhattan, and State of New York, (and whose post-office address is 565 Broadway, in said city,) have invented a certain new and useful System of Train Manipulation, of which the following is a specification.

Our invention has for its object to provide means and appliances organized into a system whereby the hauling or management of trains running to or from a destination or terminal the approach to which is made extra hazardous owing to the necessity of main-line trains, with their fuel-burning engines, having to pass through one or more long tunnels and where there is a constant liability to accident owing to the presence of steam, fog, &c., the obscuring of signals, and the heaviness of the traffic or where the approach to said destination or terminal may be through a section of city or country which may make it inadvisable to haul the heavy main-line trains into the city by means of fuel-burning engines.

Our invention therefore resides in the application of the hereinafter-described instrumentalities to the accomplishment of results whereby with very little interference with the traffic the main-line trains may be at a point distant from the depot or terminal relieved of their fuel-burning engines and with very little loss of time hauled through said tunnel or locality to the terminal or depot and rehauled back to the point of change of power and there put in connection with the main-line engine, all as hereinafter described and finally pointed out in the claims.

In the drawings forming part of this specification, Figure 1 illustrates diagrammatically a railroad plan wherein and whereby our invention may be utilized. Fig. 2 represents a vertical section of the lock or switching house on the line *x x*, Fig. 1, looking south. Fig. 3 represents the underground or depressed floor plan. Fig. 4 shows a plan of the main-level tracks. Fig. 5 is a plan view of the upper level.

Similar numerals of reference indicate corresponding parts throughout the several views.

Referring to the drawings, Fig. 1 diagrammatically illustrates in plan a section of a railroad which embodies an application of our invention. In this drawing is diagrammatically illustrated "north" and "south" bound tracks 1 and 2, terminating at a depot or terminal. These tracks in the embodiment illustrated (and of course there may be any number of them) are, through necessities created by the topography of the country through which the tracks pass to the depot, compelled to be laid through a tunnel 4.

It has been determined that in hauling trains through a tunnel of some length, especially where the tunnel passes through a city, where it must be largely closed up, it is highly undesirable to haul the main trains through the tunnel by steam or other power, whereby gas, smoke, or other noxious or signal-obscuring vapors are given off or where the air-currents are not sufficient to carry off the fog and other signal-obscuring media.

The plan of our invention therefore embraces a lock or switch system whereby the incoming or outgoing (north or south bound) trains which have been hauled by steam-locomotives and can be intercepted before they reach the tunnel by causing them to enter a lock or switch house 5 and there, in the manner hereinafter described, be relieved of the steam-locomotive and the train hauled through the tunnel and into the depot by, say, for example, an electric locomotive, and as to the outgoing or north-bound trains an electric locomotive will haul the train to the lock or switch house, which electric locomotive will there be detached from the outgoing train, as hereinafter described, and the steam-locomotive coupled to enable it to continue its journey.

In the manner hereinafter described locomotives employing steam or other objectionable motive power can be entirely prevented from entering a tunnel, a city, or other place where their use is objectionable and the substitution of the non-objectionable forms of motive power be utilized expeditiously and economically for and in place of said objectionable form of motive power.

The lock or switch house 5 may be located beyond a city's limits or at one station remote from a tunnel, so that the interception of the trains for change of motive power will not materially retard the progress of the train nor militate against the maintenance of the time-table.

A lock or switch house embodying our invention may be constructed as illustrated in Fig. 2, in which a suitable building for this purpose is illustrated. At 6 is the main-line level, and starting from this point a structure comprising pillars 7, floor-beams 8, girders 9 10, and a roof 11, diagrammatically illustrating a suitably inclosing and supporting structure, may be employed. Below the main-line level 6 an excavation 12 is made in which the pillars 7 extend, the latter resting upon suitable masonry or foundation work 13, the lower bed 14 supporting a track system, hereinafter described, and constituting the lower-track plan, a well 15 being formed about the building extending from the main-line level 6 to the lower level 14 for lighting purposes, the sides of the building being provided with windows 16 for the purpose of giving light and ventilation to the lower level. The upper and lower levels 14 17 each comprise a three-track system, while the intermediate or main level 6 embraces the two main-line tracks. Of course it will be understood that there may be any number of tracks and that the herein-described arrangement may be modified accordingly. In line with the main-line tracks (there being two illustrated) and the tracks of the upper and lower levels an elevator system comprising two double-deck elevators 18 19 is employed. These elevators comprise two platforms 20 21 22 23, each having tracks laid thereon in the same vertical plane as the upper and lower levels, both platforms being securely bound together by the connecting-rods or stay-pieces 24, tied together at the top by the brace 25 or otherwise suitably constructed, the rods 24 leading to an eye 26. Each elevator is provided with a hoisting rope or wire 27 28, which, as illustrated, may run from the eye 26 to and over sheaves 29 30, supported by the framework of the building, as the floor 8, and about a drum 31, which may be adapted to operate both elevators at once, hoisting one and lowering the other, or which may be, as is preferred, adapted to independently operate either elevator. Both of the elevators run between guides 32, which may be constructed in the usual manner and firmly affixed to the structure of the building, as to the floor-beam 8. In the well 15, formed between the main level 6 and the lower level 14, extending partly within the building or outside of it, as indicated in Fig. 3, or located in any other desired way, may be placed independent machinery for operating the elevators.

In Fig. 3 is illustrated the track system of the lower level 14. At 33 34 are the elevator-shafts for the elevators 18 19, which intercept the north and south bound switch-tracks 35 36 with extensions 37 38 for storage of extra locomotives. At 39 is an intermediate track with an extension 40 for storage purposes, which is connected to the main shunting or switch tracks 35 36 by turnouts or crossings 41 42, at the points of juncture 43 44 45 46 of which the rails may be operated by suitable switching devices 47 48 49 50, the turnouts connecting the main shunting or switch tracks and both connecting with the intermediate track. As arranged in the drawings, the turnouts connecting the main shunting or switch tracks with the intermediate track are connected with the elevator-shafts in line with rails on the respective elevator-platforms, and a turn-table 51 is located in line with the intermediate track 39. The plan of the upper level 17 is illustrated in Fig. 5, and it comprises a construction of the shafts 33 34, the two main shunting-tracks 52 53, connected with the intermediate and reserve tracks 54 55 by the turnouts 56 57, adapted to be operated by switches 58 59 60 61, the main shunting-tracks 52 53 also having reserve extension-tracks 62 63.

In Fig. 4 is illustrated the main level 6, having the two main tracks 1 and 2, over which the trains pass to or from the lock or switch house, intercepted by the elevator-shafts 33 34. All of the tracks leading from the lock or switch house and those leading from said house through the tunnel and to the terminal, as well as those on the levels 14 and 17, (and for expediency sake on the main lock-house level 6,) may be provided with a third-rail system, an underground or overhead trolley system, in case, as is preferred, electric locomotives are employed for shunting in the lock-house or hauling the trains between the latter and the terminal. As previously described, all of the tracks—that is, the main-line and main shunting tracks on the levels 14 17—are in vertical alinement with the rails on the respective elevator-platforms.

The operation is as follows: When the south-bound train, for example, arrives at the lock or switch house on track No. 2, the steam-locomotive 64 is brought to rest on the platform 23 of the elevator 19, its track being then in alinement, an electric engine 65 having been previously run from the level 17 onto the elevator-platform 22, then in alinement with the track 53. The locomotive 64 is then detached from the train and lowered, with the electric locomotive 65 on the upper platform of the elevator, to the ground floor or lower level 14, where the rails in the platform 23 are brought into alinement with track 36. The rails on the platform are then in alinement with the main-line track, and the electric engine can haul the train to the terminal. The engine then goes through the turnout 42 to the track 39 and on the turn-table 51, where it is reversed around to the northward position. It is then moved to elevator-platform 20, the rails on which are in alinement with track 33, where it awaits the arrival of a north-bound electric locomotive. When the electric north-bound train arrives on the elevator, the electric locomotive is detached. They are both raised to one story to bring the steam-locomotive on a level with the north-bound train, which will then draw the same off. The electric locomotive is then on the upper level and is moved over to the other elevator to await the arrival of another south-bound train. In this way the operation of manipulating the trains may be carried on continuously and with considerable latitude of variation.

We claim—

1. A system for handling trains comprising main-line tracks and a plurality of elevators in connection with the said main-line tracks, and tracks supported at a level above and below the main line, each of the auxiliary system of tracks being connected by switches, one of them being provided with a turntable.

2. A system of handling trains comprising main-line tracks, and elevator and lower-level track to which said elevator may descend, a shunting-track leading from said level, a further lower-level shunting-track, an elevator operating in connection therewith, means for placing both lower-level shunting-tracks in connection with each other, another main-line track between which and the latter lower-level shunting-track said elevator may operate, substantially as described.

3. A system of handling trains comprising main-line tracks, an elevator and lower-level track to which said elevator may descend, a shunting-track leading from said lower level, a further lower-level shunting-track, an elevator operating in connection therewith, means for placing both lower-level shunting-tracks in communication with each other, another main-line track between which and the latter lower-level shunting-track said elevator may operate, a turn-table in connection with the shunting-track, substantially as described.

4. In a system for manipulating railroad-trains, the combination with the following instrumentalities: a plurality of main-line tracks, a double-decked elevator adapted to be vertically operative in alinement with the main-line tracks so as to bring either deck in alinement with said main-line track, and a plurality of shunting-tracks arranged at a level above and below, and in alinement with the main-line tracks, and switches for placing the shunting-tracks in communication with each other and with the several elevator-tracks.

5. In a system for manipulating railroad-trains, the combination with the following instrumentalities: a plurality of main-line tracks, a double-decked elevator adapted to be vertically operative in alinement with the main-line tracks so as to bring either deck in alinement with said main-line tracks, and a plurality of shunting-tracks arranged at a level above and below, and in alinement with the main-line tracks and switches for placing the shunting-tracks in communication with each other and with the several elevator-decks, and an intermediate storage-track in communication with the shunting-tracks.

6. In a system for manipulating railroad-trains, the combination with the following instrumentalities: a plurality of main-line tracks, a double-decked elevator adapted to be vertically operative in alinement with the main-line tracks, and a plurality of shunting-tracks at a level above and below, and in alinement with the main-line tracks, and switches for placing the shunting in communication with each other and with the several elevator-decks, and a turn-table and the lower-level shunting-tracks.

7. In a system for manipulating railroad-trains, the combination with the following instrumentalities: a plurality of main-line tracks, a double-decked elevator adapted to be vertically operative in alinement with the main-line tracks, and a plurality of shunting-tracks at a level above and below, and in alinement with the main-line tracks and switches for placing the shunting in communication with each other and with the several elevator-decks, an intermediate storage-track in communication with the shunting-track, a turn-table and the lower-level shunting-tracks, and an intermediate track and turntable.

Signed at the city, county, and State of New York this 27th day of February, 1902.

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CHARLES I. FREEDMAN.

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