J. E. NOEGGERATH.

RAILWAY SYSTEM.

APPLICATION FILED MAR. 27, 1912.

1,027,354.

Patented May 21, 1912.

4 SHEETS—SHEET 1.

Fig. 1,

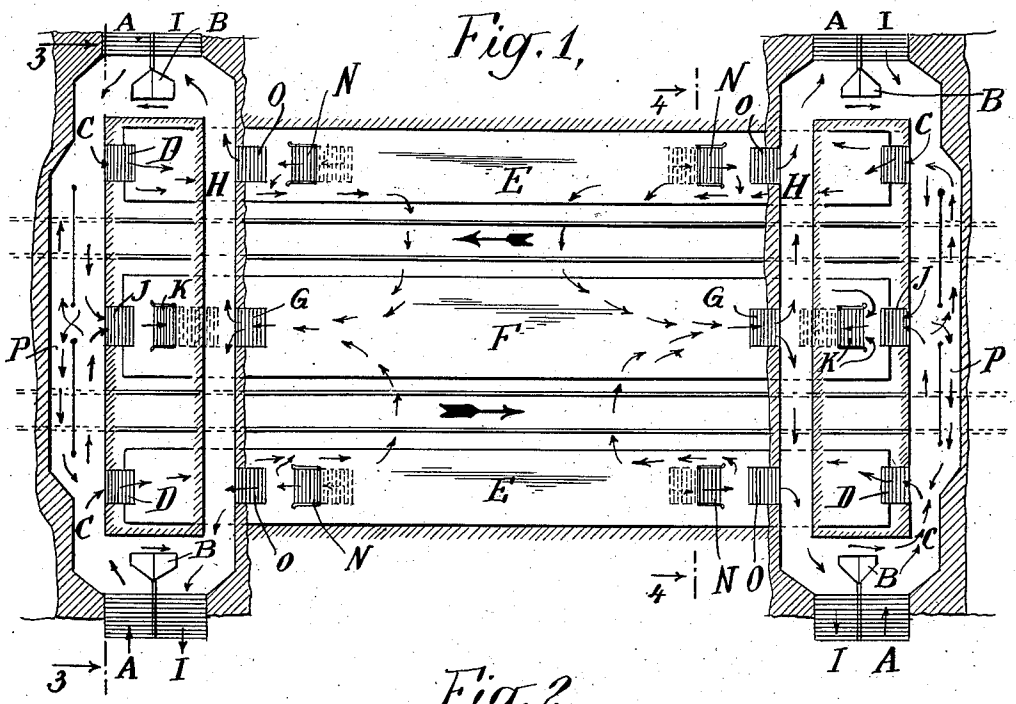
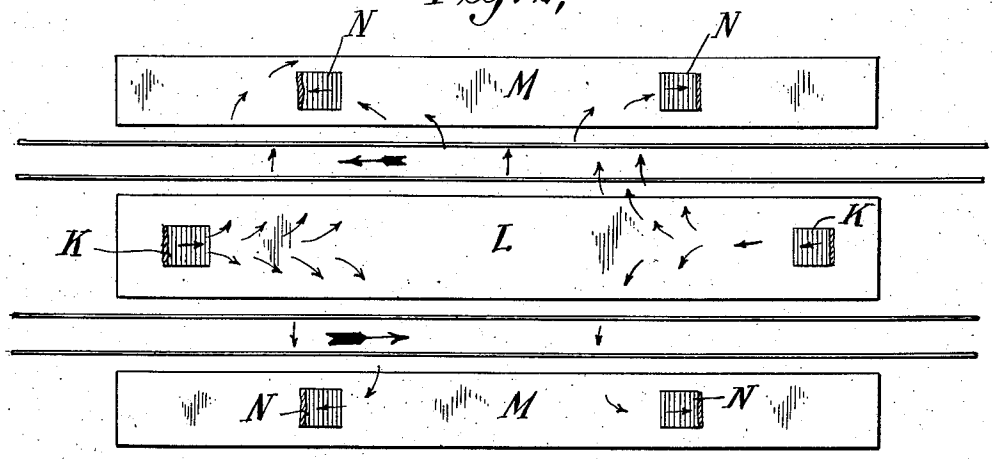


Fig. 2,



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4 SHEETS—SHEET 2.

Fig. 3.

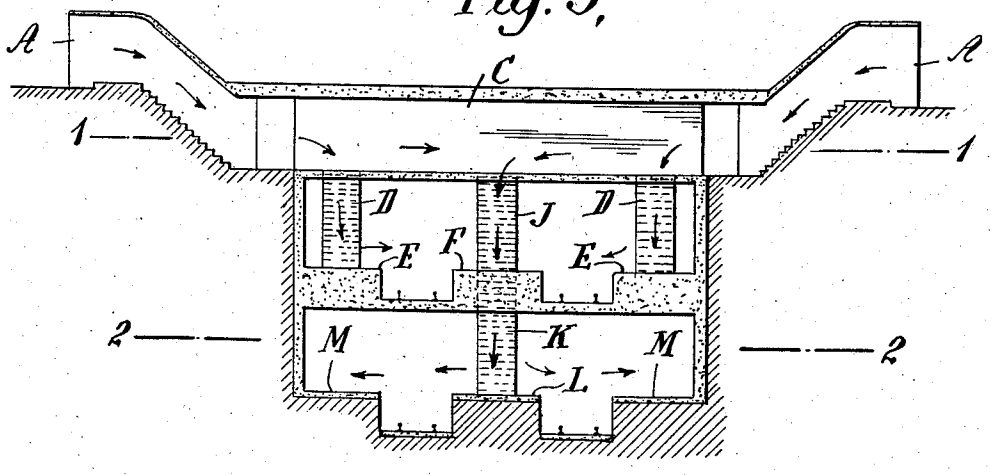
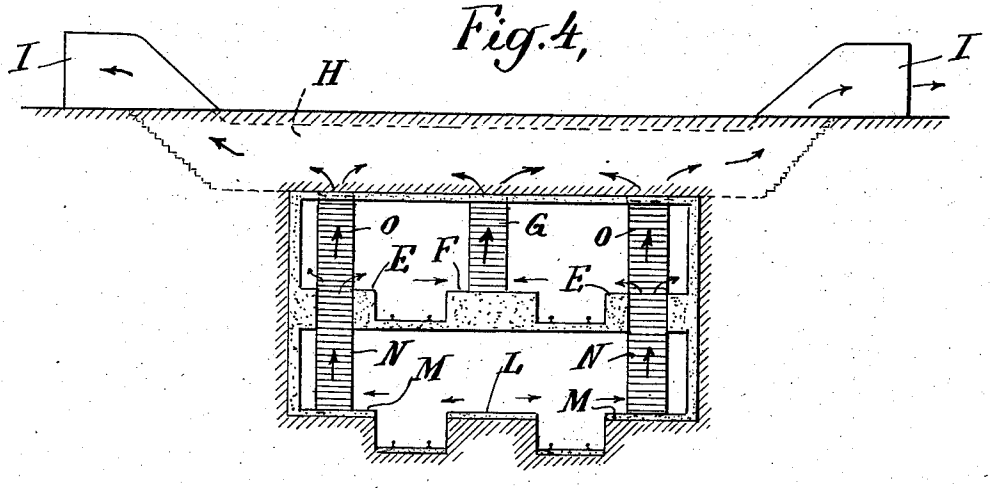


Fig. 4.



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4 SHEETS—SHEET 3.

Fig. 5,

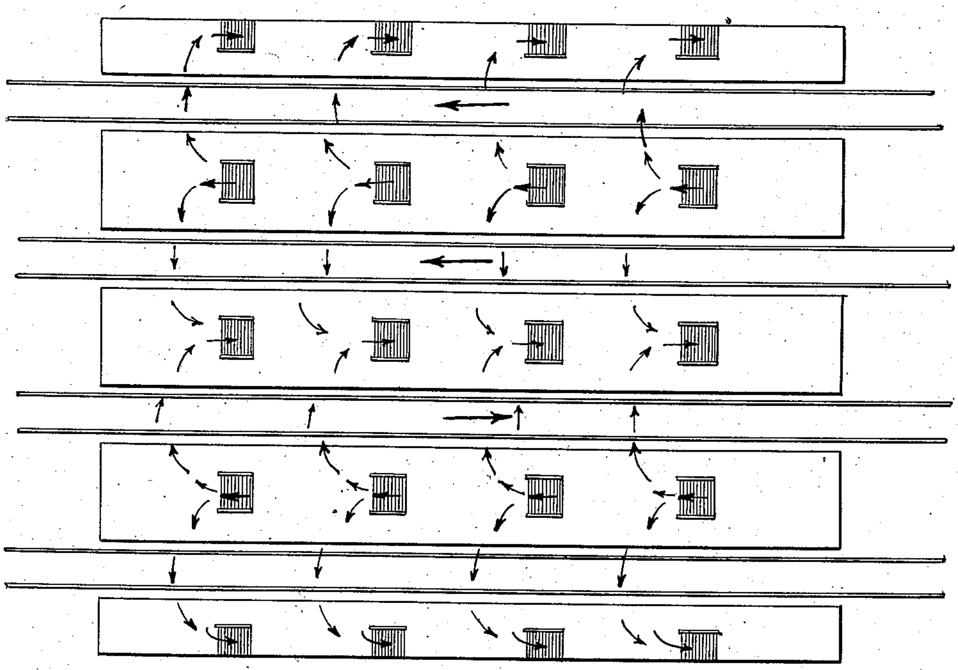
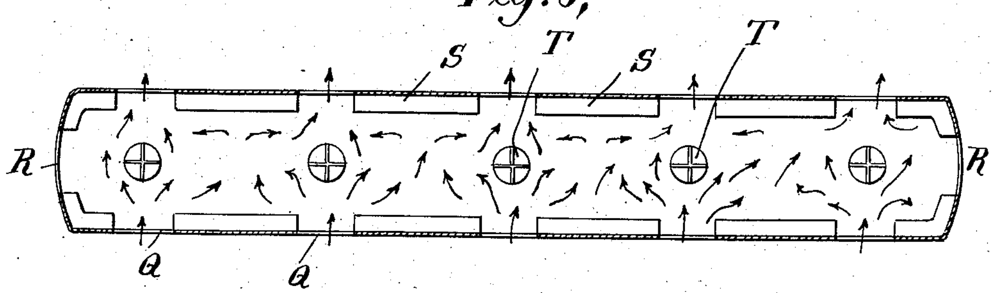


Fig. 6,



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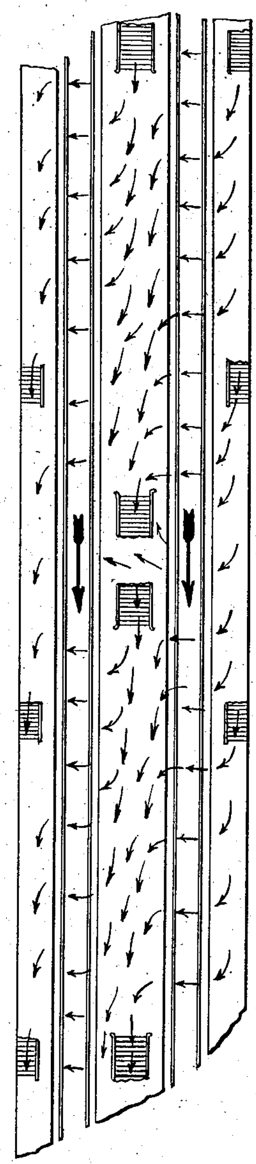
4 SHEETS—SHEET 4.

Fig. 7,



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UNITED STATES PATENT OFFICE.

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RAILWAY SYSTEM.

1,027,354. Specification of Letters Patent. Patented May 21, 1912.

Application filed March 27, 1912. Serial No. 686,472.

To all whom it may concern:

Be it known that I, JAKOB EMIL NOEGGERATH, a citizen of the United States, residing in New York city, in the county and State of New York, have invented certain new and useful Improvements in Railway Systems; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention is an improvement in an organization of correlated elements cooperating to constitute a rapid transit railway system and is more particularly directed to the improvement of such an organization in which four or more tracks are employed for express and local service and in which a station is required to be so associated with the tracks and other necessary fixtures and designed to coöperate with the cars or trains run upon the tracks in such manner as to afford the greatest facility for directing passengers to, from and between local and express cars or trains with the object in view of raising the efficiency of the organization as a whole and adding to the convenience of those using the system as a means of transportation.

The movement of cars and trains in rapid transit systems has been developed to a high degree of efficiency and it remains for the further increase of the efficiency to refine the design of the stations, comprising entrances, exits and pathways to and from the cars or trains, with a view to facilitating the movement of passengers therein, and consequently reducing the time required for loading and unloading the trains so that full advantage may be taken of the already existing development of the transportation elements, and the system as a whole may be operated in the most effective manner. This is particularly true in connection with a rapid transit system in which four or more tracks are employed for express and local service. The development of such a system in underground or subway installations has created the need for a scientifically designed station for the single level subway, and this need is still more pressing in connection with a double deck or two level subway in which two local tracks are built upon one level and two express tracks are placed either below or above upon a second level, or wherein two uptown tracks are placed upon one level and two downtown tracks upon the other.

The time required for passengers to leave and board the cars or trains, owing to the unscientific plan of the pathways which must be traveled by the passengers in executing these maneuvers, has been greater than should be required for this purpose, and as this time has determined the length of the stops of the cars or trains the improvement in efficiency of the system has been restrained by this lack of perfection in the plan of the stations. Advances have been made in the direction of improving the plans of the stations in recent times owing to the swift advance in the development of subways but much is yet to be desired in this connection, especially with reference to the stations of the type above referred to wherein passengers are to be directed to, from and between both local and express cars or trains running in both directions.

The present invention is not intended to embrace mechanical devices for absolutely requiring passengers to move in fixed directions, such as stiles, and the like, nor a specific plan of action for the conduct of guards and employees personally engaged in directing the course of passengers within the station, but it is confined to the provision of structural characteristics in the design of the station to provide facilities for movement of the passengers throughout the station, that it may be possible to readily control such movement by such mechanical devices, by indicators or by guards carrying out a definite plan of directive control of the moving body of passengers.

This invention contemplates the employment of that type of car which is provided with a plurality of side doors and arranged to permit the entrance of passengers from one side and exit from the other side, the interior arrangement affording easy access to and out from the seats through the entrance and exit doors with the minimum amount of opposition between the incoming and outgoing streams of passengers.

The platforms adjacent the cars are intended for movement of passengers in one direction only, *i. e.*, toward the cars on the entrance side and from the cars on the exit side and as it is a requirement of great importance in my improved system that passengers passing to, from and between the trains need not oppose one another, I ar-

range the entrances and exits from such platforms as require both entrance and exit in such manner that with unobstructed platforms the most obvious and direct pathways to the cars from the entrances to the platforms and the most obvious and direct pathways from the cars to the exits from the platforms do not coincide except where passengers moving along both move in the same direction. Such an arrangement is only possible where the cars are entered from one side only and left by the other side and it is here made available by the combined use of cars of that type and the advantageous arrangement of platform entrances and exits hereinafter more particularly described in connection with the accompanying drawings.

The transfer of passengers from an express train bound in one direction to an express bound in the other direction is not desirable nor essential, and is in any case exceptional, and the platform arrangement just described is more particularly designed to be used between an express and a local track upon which trains are bound in the same or opposite directions.

While the arrangement just described, wherein a platform serves for passengers leaving one train and entering another, illustrates a possible embodiment of my present invention in a rapid transit system, which will effect a marked improvement in efficiency of such a system where the requirement for this arrangement is due to existing circumstances which would preclude a better, I prefer in some cases to so arrange the platform that one may be used solely for entering passengers and another for those leaving the cars.

In the accompanying drawings, I have illustrated in Figure 1, a plan of the upper level of a two-level subway express station constituting the preferred embodiment of this invention and showing the entrances, exits, galleries, platforms and stairways; in Fig. 2, a similar plan of the lower level of the same station; in Fig. 3, a section in elevation on line 3—3 of Fig. 1; in Fig. 4, a similar section on line 4—4 of Fig. 1; in Fig. 5, a plan of a modified arrangement adapted for a single level station; in Fig. 6, a floor plan of the type of car which I prefer to use in my improved system; and in Fig. 7, a plan of one level of a station wherein an express track and a local track for trains bound in the same direction occupy the same level.

Referring to Figs. 1 to 4, the station illustrated has two levels, the upper level being occupied by two local tracks and the lower level by two express tracks. The arrows upon the tracks indicate the directions in which trains move along the same.

The directions which passengers may take throughout the station upon the galleries, stairways and platforms are indicated upon the several figures by arrows.

Four entrances A are shown from which passengers passing before the booths B pass along an entrance gallery C, and if they are bound for local trains they will descend the stairways D to the local platforms E upon the upper level (see Fig. 1). From the platforms E they will pass into the cars by the side doors. Passengers leaving the cars of a local train at this station leave the cars through the doors upon the opposite side from that at which they enter the cars and emerge upon the central platform F of the upper level from which they mount the stairways G to the exit galleries H and along these galleries to the exits I.

Passengers bound from the entrances A to express trains pass along the entrance galleries C to and down the stairway J to the upper central platform F and continue down the stairway K which is directly in front of the stairway J, to the central platform L of the lower level from which they enter the express trains, passengers leaving express trains emerge therefrom on to the side platforms M of the lower level, pass up the stairways N to the side platforms of E of the upper level and then up the stairway O which is directly in front of the stairway N, to the exit galleries H where they join the stream of passengers passing from the stairway G as before described and move to the exits I.

A passenger leaving a local train and emerging upon the center platform F on the upper level will pass along this platform to and down the stairway K to the central platform L of the lower level from which he may reach the express trains.

A passenger leaving an express strain and emerging upon a side platform M on the lower level and wishing to board a local train going in the same direction, moves up the stairway N on to the platform E and into the local train. If he wishes to board a local train moving in the opposite direction to the express which he has just left, he moves up the stairway O, instead of turning out onto platform E, passes behind the booth B and joins the incoming stream of passengers continuing to the center of the entrance gallery C and entering a bypass P to avoid the incoming stream of passengers from the other side, reaches the far stairway D leading to the side platform E on the upper level and upon the opposite side of the station from that where he emerged from the express train; and from this platform E he may board a local train bound in the opposite direction.

It will be noted that platforms, stairways and galleries have been provided in the station described through which passengers may move to and between the entrances and

to trains in every required direction without having to oppose a passenger who is bound in the opposite direction.

By referring to the arrows in the several figures, it will be seen that the pathways have been arranged as far as possible to make the most obvious course through the station one in which a passenger will not oppose those traveling in an opposite direction.

Referring to Fig. 5, the arrangement of a single level station will be clearly understood by simply referring to the directions of the arrows.

Fig. 6 indicates the preferred floor arrangement of the car which I prefer to employ. This car, as will be seen has five doors Q upon each side and end doors R to give access from one car to another. Side seats S are provided between the doors and center quadruple seats T are arranged opposite the doors. The facility with which passengers may enter by the doors upon one side find seats and pass to and leave by the doors upon the other side will be best appreciated by referring to the arrows upon the drawing indicating the general movement of passengers to and from every part of the car.

In Fig. 7, I have shown an arrangement of a platform for use where circumstances require that a single unobstructed platform must be used for the exit of passengers from one train, the entrance for passengers to a train upon the opposite side and transfer of passengers from the first named train to the latter. Here too the direction of travel indicated by the arrows will clearly show the arrangement of exits and entrances to and from the platform, the arrangement of which coöperates with the type of car used to prevent opposition between the streams of incoming and outgoing passengers.

Moving stairways may be used and the direction of travel of the passengers controlled in this way.

When more than two tracks are used on one level as would be the case in a four-track single level subway or where eight tracks are employed and arranged in my preferred manner, illustrated in Figs. 1 to 4, it would be difficult for passengers to transfer, were not some provision made for transferring from one to another track upon the same level. In the form shown in Figs 1 to 4, transferring is done by means of the stairways from or to a platform above a second platform, but when four tracks on a level are employed, as in an eight-track two-level system, it is quite necessary that passengers may transfer directly across the platform, and when it is desirable, I prefer to so arrange the tracks that the platform arrangement shown in Fig. 7 is brought into play. This arrangement requires the stairways leading to and from the platform to be alternated along the length of the platform, in order that the passengers may move in but one direction upon any given part of the platform. It is not necessary that all transferring be done on such platforms but, as in the case of the 8-track two-level arrangement, one or two of such transfer platforms may be used upon each level, and at other points the transferring may be effected by means of the stairways, as shown in Figs. 1 to 4.

The alternating entrance and exit stairways leading to and from a transferring platform may be spaced at equal distances, or at unequal distances, as in Fig. 7. Of course, two stairways occupying substantially the same position upon the platform though passing in opposite directions, if they were both used as an entrance or as an exit, would be considered one stairway in so far as the term "alternating entrance and exit stairways" applies in this specification.

Having thus described my invention what I claim is:—

1. In a railway system the combination with express and local tracks and cars having entrance doors on one side and exit doors upon the other side thereof, of an express station having a pathway for passengers leading to, through and from a car on one of said local tracks, a pathway leading to, through and from a car on one of said express tracks, a connecting pathway affording communication between said pathway from said local track and said pathway to said express track, and a second connecting pathway affording communication between said pathway to said local track and said pathway from said express track, whereby streams of incoming and outgoing passengers may move, in one direction only, along said pathways and through said cars; substantially as described.

2. In a railway system the combination with express tracks for the movement of express trains in both directions and local tracks for the movement of local trains in both directions, of an express station having an incoming trunk pathway from the entrance of said station, an outgoing trunk pathway to the exit of said station, a branch pathway leading from said incoming trunk pathway to, through and from the cars of a train on either of said local tracks and thence to said outgoing trunk pathway, a branch pathway leading from said incoming trunk pathway to, through and from the cars of a train on either of said express tracks and thence to said outgoing trunk pathway, a connecting pathway between said branch pathway to said local tracks and said branch pathway from said express tracks, and a connecting pathway between said branch pathway to said express tracks

and said branch pathway from said local tracks, whereby streams of incoming, outgoing and transferring passengers may move, in one direction only, along said pathways and through said cars; substantially as described.

3. In a railway system, the combination of two lower tracks and two superposed tracks, two of said tracks being utilized for the movement of cars in one direction and the remaining two for the movement of cars in the opposite direction, a central platform between the tracks upon each level, side platforms at the outer sides of each of said tracks, cars upon said tracks and having entrance doors upon their one side and exit doors upon their opposite side, a station entrance communicating with the central platform of one level and the side platforms of the other level, a station exit communicating with the remaining platforms and stairways connecting each lower platform with its corresponding superposed platform, whereby passengers may pass to, from and between said cars in unopposing streams; substantially as described.

4. In a railway system, the combination of a plurality of tracks located upon one level, a plurality of tracks located upon another level, platforms adjacent each side of each of said tracks, transfer stairways between the outermost platforms on one level and the corresponding platforms on the other level, and alternately arranged entrance and exit stairways leading to an intermediate platform on each of said levels to permit passengers to transfer directly across said platform and pass to and from the cars from and to said entrance and exit stairways in unopposing streams; substantially as described.

5. In a railway system, the combination, with two tracks of a platform located between said tracks and serving as an exit platform from a train on one of said tracks and as an entrance platform to a train on the other of said tracks of entrance and exit stairways leading to and from said platform, said entrance stairways alternating with said exit stairways to admit of entering and leaving passengers passing to and from the trains and transferring passengers passing between the trains in unopposing streams upon said platform; substantially as described.

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

JAKOB EMIL NOEGGERATH.

Witnesses:
MARCUS C. HOPKINS,
MINERVA LOBEL.