June 6, 1939. J. B. STRAUSS 2,161,105

RAPID TRANSIT SYSTEM

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FIG. 1.

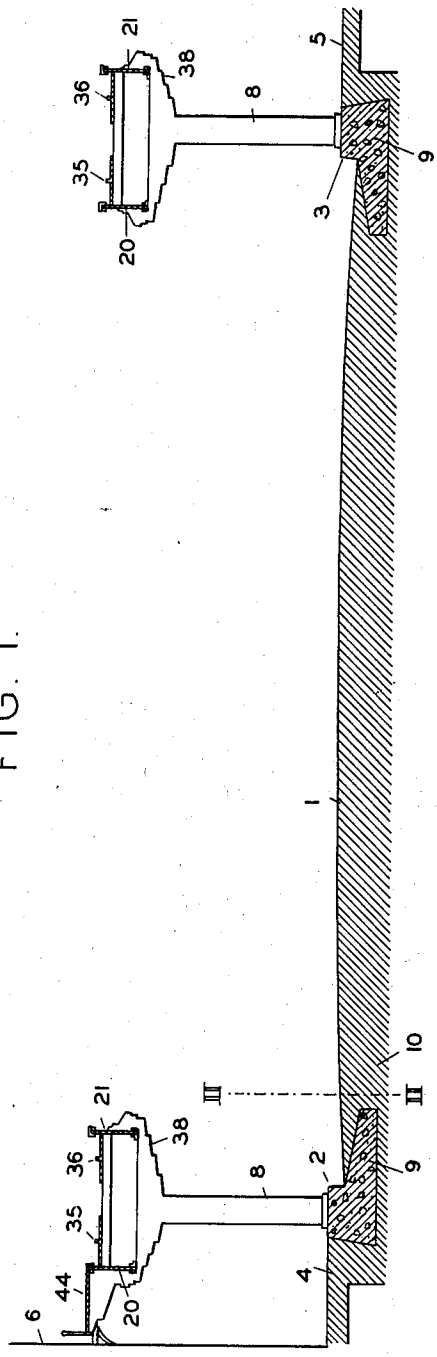
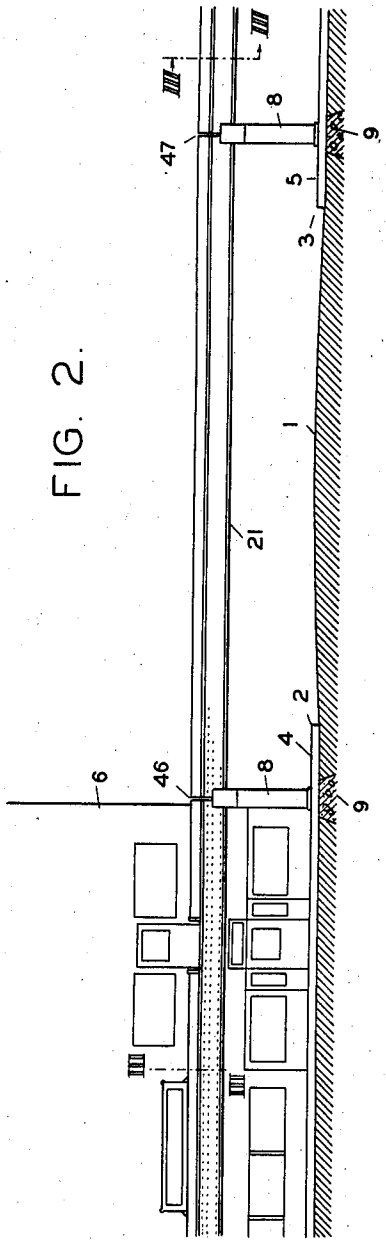


FIG. 2.



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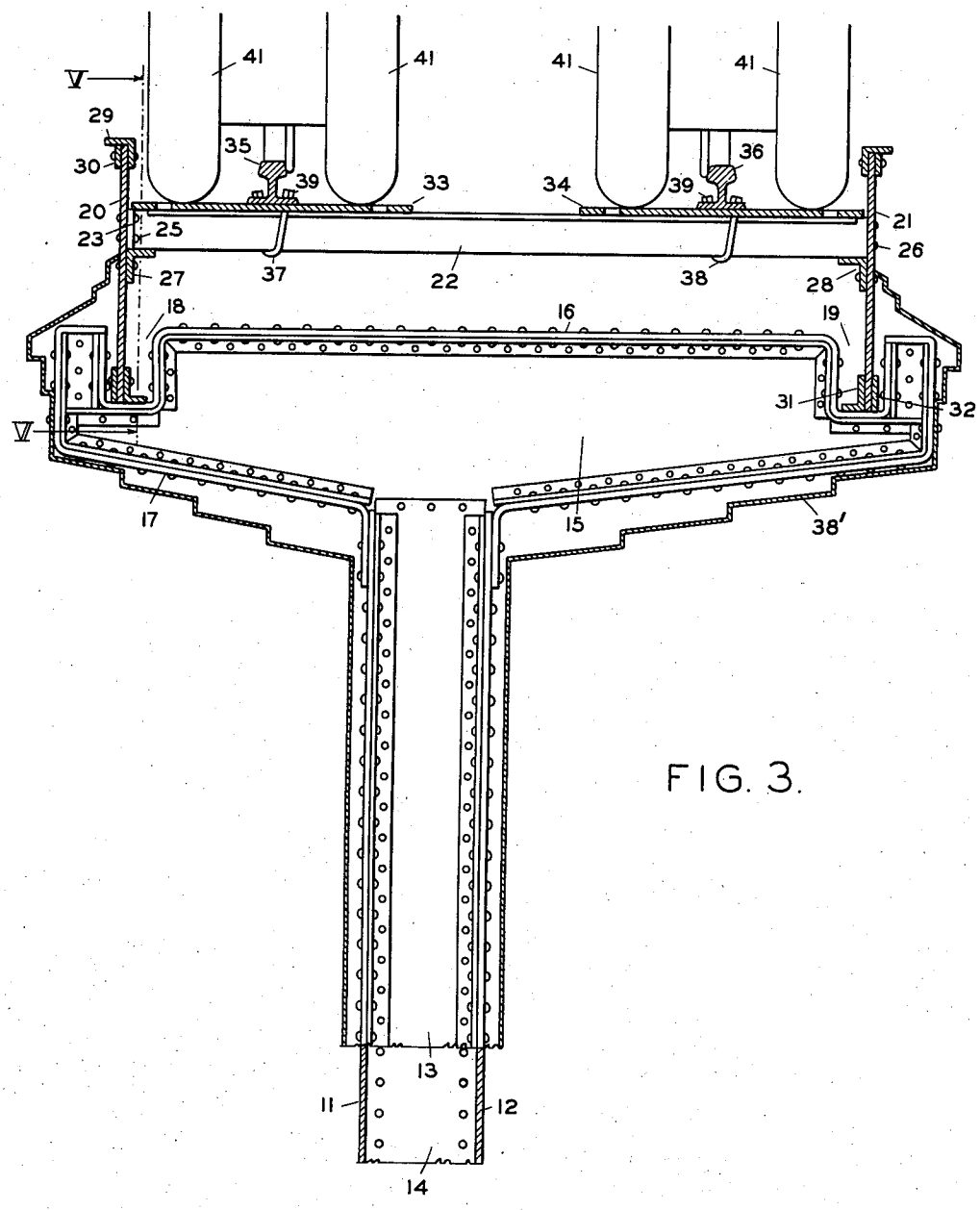


FIG. 3.

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FIG. 4.

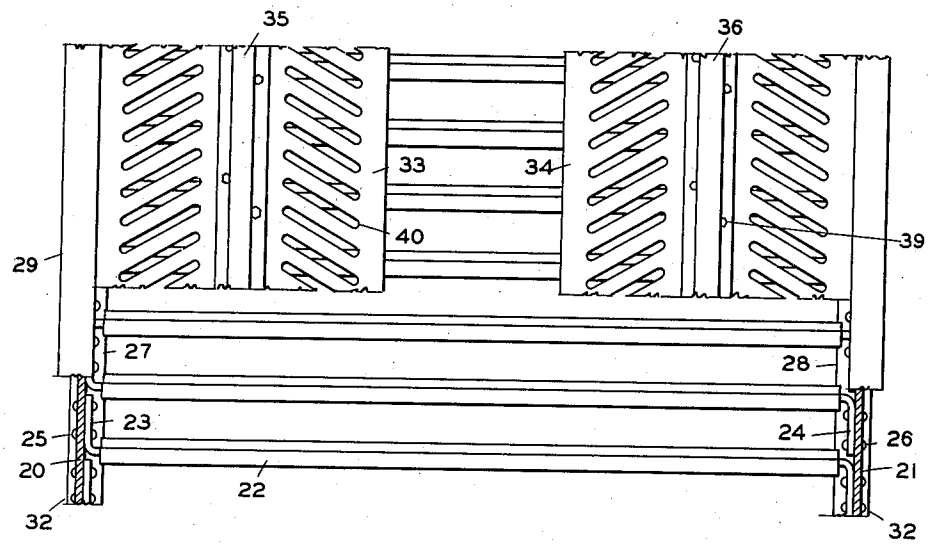
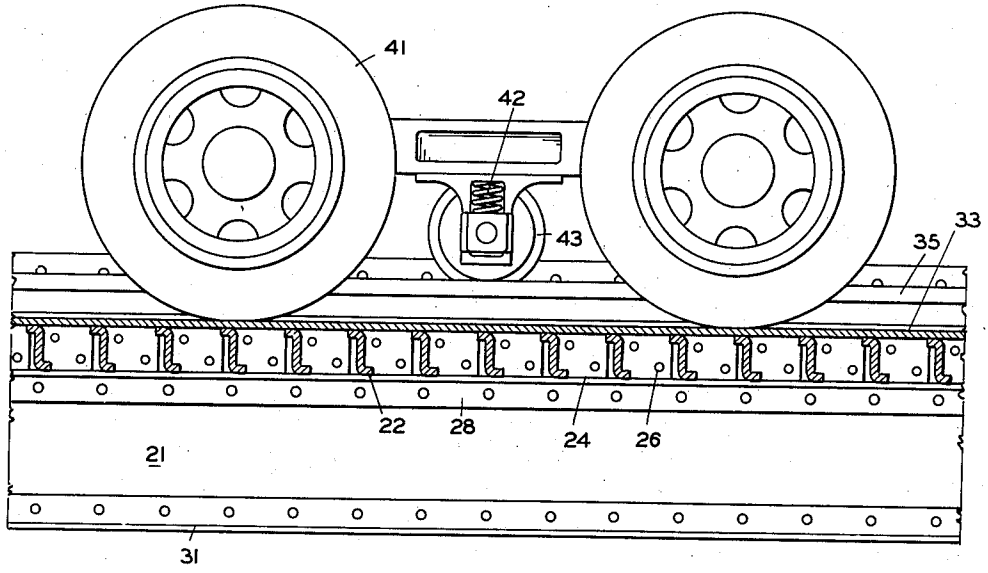


FIG. 5.



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UNITED STATES PATENT OFFICE

2,161,105

RAPID TRANSIT SYSTEM

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Application March 23, 1937, Serial No. 132,509

1 Claim. (Cl. 104—124)

This invention relates to improvements in "rapid transit systems" and more particularly to the construction and arrangement of overhead traffic means with respect to city streets.

The growth of modern cities, necessitating the development of suburban residential sections, taxes transportation facilities to the point where surface congestion at peak periods slows up distribution to an intolerable extent.

Subsurface transportation presents engineering and economic problems that do not justify the financial outlay and the physical disturbances incidental to construction of subways in congested districts. Elevated railways have heretofore been noisy, unsightly and incidentally have encroached upon the very street traffic that they are supposed to relieve.

It is an object of the present invention to increase the traffic capacity of a city street without the many disadvantages set forth above.

Another object is to increase rather than to depreciate the value of adjacent property by installing the present system.

Another object is to facilitate pedestrian as well as vehicular traffic in congested districts.

Another object is to so construct and locate the overhead traffic system, that it may be installed with minimum interference with existing conditions.

Another object is to provide for railway and motor bus traffic on a common right-of-way.

Another object is to provide for overhead pedestrian traffic between the elevated right-of-way and the second stories of adjacent property, giving added street frontage value to such property.

Another object is to increase the available street area and to increase the speed of surface vehicular traffic by reducing the number of pedestrians on the lower level.

Another object is to reduce the probable accident ratio in city traffic of all forms, by reducing congestion and facilitating distribution during peak periods.

Other objects and advantages will appear as the description progresses.

In this specification and the accompanying drawings the invention is disclosed in its preferred form. But it is to be understood that it is not limited to this form because it may be embodied in other forms within the purview of the claim following the description.

In the three sheets of drawings:

Fig. 1 is a transverse section of a conventional city street having elevated traffic means applied thereto in accordance with this invention.

Fig. 2 is a longitudinal section of the same, taken on the line II—II, Fig. 1.

Fig. 3 is a detail in cross section of the upper portion of the elevated right-of-way, taken on the line III—III, Fig. 2.

Fig. 4 is a plan view of the same.

Fig. 5 is longitudinal section of the same taken on the line V—V in Fig. 3.

In detail the construction illustrated in Fig. 1 comprises the conventional street pavement **1**, extending between the curbs **2** and **3**, and the usual sidewalks **4** and **5** extending to the building façades **6**.

The supporting standards **8—8** are erected at the curb lines, with the proper set back, and have the sub-pavement footing **9**, preferably of reinforced concrete adapted to combine with and form an integral part of the base structure **10** of the street pavement to give mass stability to the overhead structure. These standards may be reinforced concrete or built up of architectural steel shapes such as the four vertical plates **11**, **12**, **13** and **14** joined at the corners by riveted angles as shown in Fig. 3.

These standards have the T shape heads comprising interspaced plates such as **15** riveted to the overlying plates **13**, **14** and encircled by the plates **16**, **17** joined to the head plates by riveted angles in accordance with prevailing practice. These heads are provided with the gaps **18** and **19** to receive the superstructure.

The elevated traffic lane comprises two plate girders **20** and **21**, see Fig. 3, extending the length of the elevated system. These girders are great enough in depth and cross section to bridge the distances between the supporting standard **8** and carry the traffic loads when properly braced. Intermediate the height of the girders the traction deck is interposed forming a structure substantially H shaped in cross section. It comprises the transverse grid bars **22** having the bent ends **23**, **24**, riveted at **25**, **26** to their respective girders. These ends are preferably bent in opposite directions to prevent the bars turning for greater vertical stability, see Fig. 4. The angle stringers **27**, **28** are riveted to the girders to reinforce the support of the ends **23**, **24**. The upper and lower edges of the girders are reinforced with the angles and plates **29**, **30** and **31**, **32** to prevent buckling of these edges.

The traction plates **33**, **34** are laid upon the grid bars **22** and are surmounted by the railway rails **35**, **36** respectively, throughout the length of the

girders. These traction plates and rails are held in assembly with the grid bars by the yokes **37**, **38** see Fig. 3 looped at intervals beneath the bars and passing through the traction plates and rail bases, where they are drawn taut by the nuts **39**, **39** on their opposite ends. The combination of elements assembled with the plate girders, form a superstructure substantially H shape in cross section, all mutually cooperating to meet the line of applied load. This is further strengthened by the manner of supporting the superstructure. The lower edges of the H rest within the gaps **18** and **19** formed in the tops of the heads of the standards **8**, which in conjunction with the grid bars **22** permits easy seating of the girders and prevents spreading.

As a contribution to architectural refinement the T head of the standards may be enclosed with sheet metal caps such as **38'** to hide the rugged structures beneath.

The grid bars **22** supporting the traction deck permit the penetration of light therebetween, also provide for proper drainage for rain water and snow. This is further provided for by the perforations **40** through the traction plates **33**, **34**, see Fig. 4. These perforations provide improved traction for resilient tires such as **41**. The extension of the girders above the traffic deck acts as guard rails to keep a disabled or derailed vehicle from plunging into the street below. Besides the simplicity and strength of the solid plate girders **20**, **21** they also act to prevent the diffusion of incidental traffic sounds, especially toward the adjacent property frontage.

The rails **35**, **36** provide traction for conventional flanged wheel traffic vehicles such as trains with rubber mounted rolling stock operated with minimum noise for interurban express service to downtown stations.

Fig. 5 schematically illustrates a four wheel pneumatic tired supporting truck of a motor bus having the flanged guide wheels **43** mounted upon the bolster thereof. The interposed spring **42** on each side insures the proper downward pressure of the wheels on the guide rails **35**, **36**. These wheels insure the proper alinement of all pneumatic tires **41** with the traction plates **33**, **34** for obvious reasons. These rails **35**, **36** are thus the conjunctive element in adapting the overhead structure to combined railway and motor bus vehicles; converting the motor bus into a railway coach while operating thereon during which the driver has no independent directional control. When the motor bus leaves the elevated way at selected points the guide wheels remain elevated above the traction surface of the tires **41**. This is accomplished by inclining the traction plates **33**, **34** up to the level of the rails **35**, **36** to lift the guide wheel free of the rails, restoring the motor bus to control by its independent steering gear.

Pedestrian traffic is provided for by the elevated pedestrian walks **44** supported by the inner girder **20** and extending to the adjacent building façades **6** at the second story level; these walks are at the approximate level of the top of the girder to facilitate access to the vehicle floor levels without cutting through the girders. By this arrangement the waiting rooms can be within the adjacent buildings, with advantages to property owners and travelers.

Expansion joints as at **46**, **47** are provided at proper points, see Fig. 2, to permit elongation and contraction of the integral structure of the girders **20**, **21** due to temperature variations.

Having thus described this invention what is claimed and desired to secure by Letters Patent is:

A traffic structure comprising a pair of vertical plate girders; interspaced transverse bars having their opposite ends fixed to the sides of said girders respectively, and forming a deck above the vertical centers of said girders; a pair of traction plates arranged on said deck adjacent said girders; railway rails mounted on the transverse center portions of said plates respectively; and rail-anchoring means comprising yokes looped under said bars and having their opposite ends extending through said traction plates and engaging the bases of said rails respectively.

JOSEPH B. STRAUSS.