R. A. ILG.

SMOKE ABATING SYSTEM FOR RAILWAY STATIONS.

APPLICATION FILED MAR. 9, 1914.

1,114,001.

Patented Oct. 20, 1914.

3 SHEETS—SHEET 1.

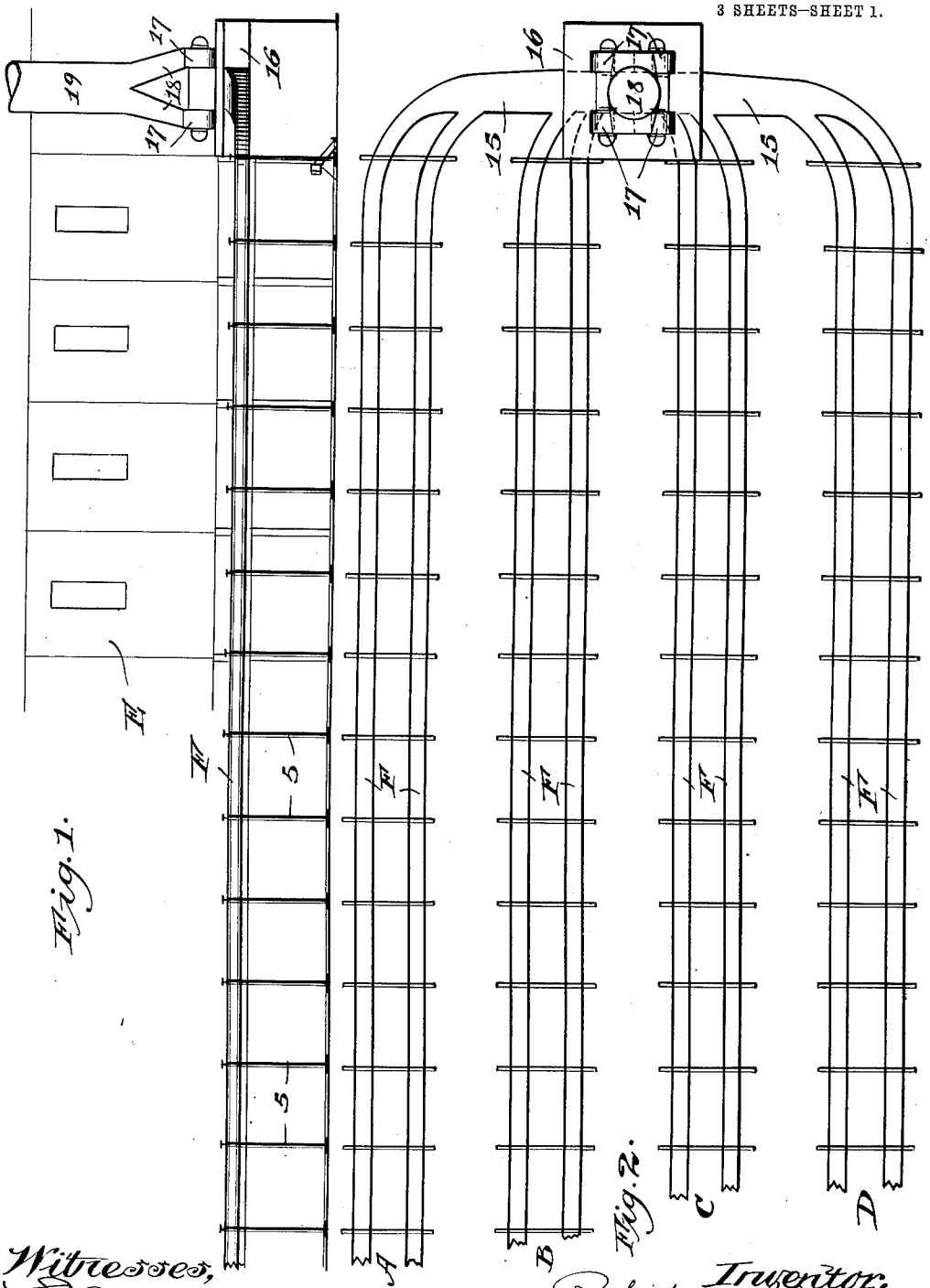


Fig. 1.

Fig. 2.

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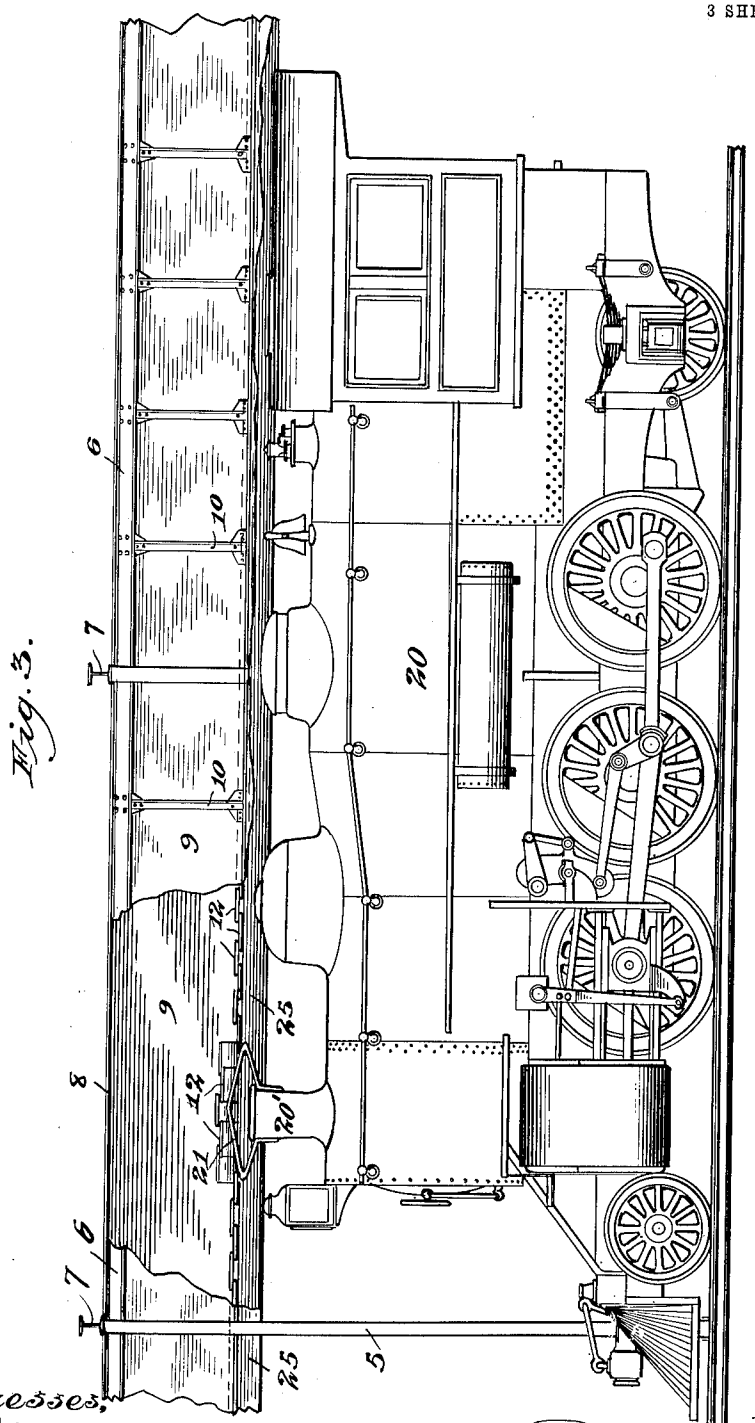
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3 SHEETS—SHEET 2.

Fig. 3.



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3 SHEETS—SHEET 3.

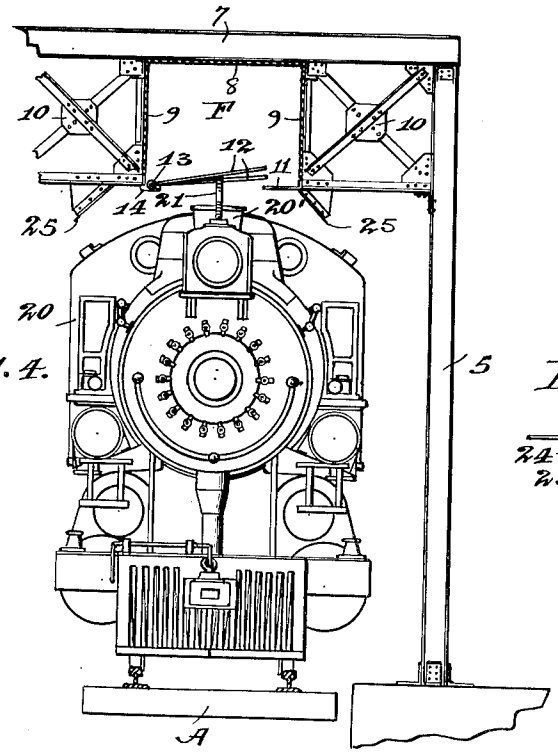


Fig. 4.

Fig. 7.

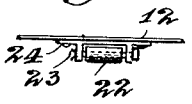


Fig. 5.

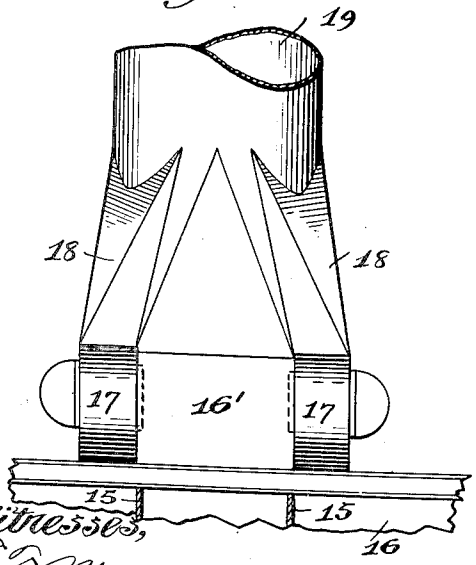
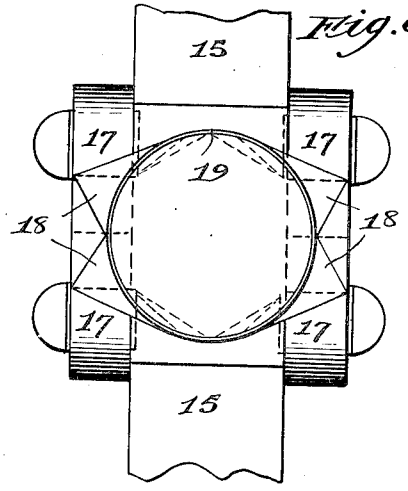


Fig. 6.



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UNITED STATES PATENT OFFICE.

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SMOKE-ABATING SYSTEM FOR RAILWAY-STATIONS.

1,114,001. Specification of Letters Patent. Patented Oct. 20, 1914.

Application filed March 9, 1914. Serial No. 823,559.

To all whom it may concern:

Be it known that I, ROBERT A. ILG, 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 Smoke-Abating Systems for Railway-Stations, of which the following is a specification.

This invention relates to systems for abating the smoke nuisance in railway terminals and other stations.

Among the salient objects of the invention are, to provide a system whereby the smoke and steam emitted from the smoke-stack of a locomotive as it enters and remains within a railway station shall be carried off through a suitable conduit and chimney, thus avoiding the fouling of the atmosphere by objectionable smoke and gases, to provide a system wherein, in connection with the withdrawal of the smoke and steam, the tracks and platforms may be fully covered and protected from rain and snow, to provide a system which will permit the area or space above that required for the handling of trains and passengers to be utilized for building purposes, to provide a new and improved automatic valve or shutter-operating mechanism for smoke outlets that extend above the tracks, and, generally, to provide a new and improved railway station structure combining an economy of space with the elimination of the smoke and steam nuisance and complete protection to passengers and rolling stock from the elements while in the station.

My invention, its mode of operation, and the benefits and advantages resulting therefrom will all be readily understood from a consideration of the following detail description taken in connection with the accompanying drawings in which I have illustrated one practical embodiment of the invention and in which—

Figure 1 is a side elevational view illustrating my invention mainly in diagrammatic form. Fig. 2 is a top plan view, more particularly illustrating one practical arrangement and organization of smoke conduits and discharge chimney. Fig. 3 is an enlarged detail side elevation, partially broken away, of a portion of a railway track and smoke conduit, showing a locomotive with my improved valve or shutter-operating means in connection therewith. Fig. 4 is a front elevation, partly in cross-section, of the parts shown in Fig. 3. Fig. 5 is an enlarged detail of the lower portion of the smoke-stack, suction box and suction blowers associated therewith. Fig. 6 is a top plan view of the parts shown in Fig. 5. Fig. 7 is a detail view in edge elevation of a fragment of one of the shutters, more particularly illustrating an anti-friction device thereon for engaging the shutter-opening shoe of the locomotive.

Referring to the drawings, Figs. 1 and 2 illustrate in a diagrammatic way a railway terminal track arrangement comprising, in the instance shown, four pairs of tracks A, B, C and D, with suitable space between adjacent pairs of tracks for the accommodation of the usual floors or platforms facilitating access to and exit from trains.

Above the entire series of tracks and platforms is erected a skeleton steel structure comprising in the main steel posts 5 and longitudinal and transverse girders 6 and 7 extending to a height slightly greater than the maximum height of the locomotive smoke-stack, and forming a general supporting structure for the erection thereupon of a building structure of one or more stories in height diagrammatically indicated at E in Fig. 1. This general steel sub-structure last mentioned also constitutes a support or carrier for a series of smoke conduits, each of which is located centrally above a track. These individual smoke conduits are designated as an entirety by the reference letter F in Figs. 1 and 2, and each consists in the main of sheet metal top and side walls 8 and 9, respectively, secured to and supported by the cross girders 7 and suitable lateral skeleton frames indicated at 10 in Fig. 4. The bottom wall of the smoke conduit F comprises a stationary part wall or ledge 11, and a series of valves 12 herein shown as of shutter form, said valves being hinged at one end at 13 to suitable hinge lugs 14 on the lower edge of the side wall 9 of the conduit, and the opposite free ends of said valves overlapping the stationary ledge 11. As best shown in Fig. 3, these valve-shutters are arranged in edgewise overlapping relation, whereby the raising of one shutter from beneath as hereinafter described automatically effects a simultaneous raising of the shutter on each side thereof.

The several smoke conduits F, constructed as described, communicate at their respective inner ends with manifolds 15 (Fig. 2), the

inner ends of which latter in turn communicate with opposite sides of a smoke-box 16 preferably located substantially centrally of the width of the series of tracks and opposite the inner end of the latter. At the four corners of the upper portion 16′ of the smoke-box is located a battery of rotary blowers 17, each of which communicates on its suction side with the interior of the smoke-box and, at its upper discharge end, communicates through a hollow leg 18 with a vertical smoke-flue or chimney 19 leading upwardly to a suitable height for the delivery of the smoke and gases.

The outer ends of the horizontal smoke conduits F are not illustrated, but it is to be understood that said outer ends are suitably sealed to the atmosphere; and hence it will be readily understood that when the blowers 17 are in operation, a suction effect is produced through the several smoke conduits F, thereby creating a vacuous condition therein. Preferably a sufficient leakage is permitted between the overlapping edges of the valve-shutters 12 and the outer ends of the upper shutters of the series to draw off from the train shed space such minor quantities of smoke, gases and steam as are not directly drawn into the conduit from the smoke-stack of the locomotive. It is to be understood that the valve-shutters 12 are of sufficient weight to resist the opening tendency caused by the vacuous condition within the conduit.

20 designates as an entirety a locomotive, to the upper end of the smoke-stack 20′ of which is secured a valve-opening shoe 21. This shoe preferably consists of a strip of metal bent to the substantially diamond shape or form shown in Fig. 3, the ends of which are attached to opposite sides of the upper end of the smoke-stack 20′ with the body of the shoe projecting slightly above the latter. The shoe thus constitutes a double-ended cam, the upper inclined sides of which engage the under sides of the valve-shutters 12 as the locomotive enters or leaves the train shed, raising a group of said shutters in the manner indicated in Figs. 3 and 4, thus affording a local opening in the valved bottom wall of the conduit for the direct drawing off by the vacuum in the latter of the smoke and gases issuing from the smoke-stack. To reduce wear and facilitate this automatic opening of the shutter-valves, I preferably apply to the lower side of each of the latter an anti-friction roller 22 which may conveniently be journaled on a spindle 23 mounted in a roller supporting bracket 24 secured to the under side of the shutter. The roller 22 is somewhat shorter than the space between the spindle-supporting lugs of the bracket 24, thereby permitting a slight endwise movement of the roller which must take place during the lifting movement of the shutter by the shoe. To further facilitate the complete abstraction of the smoke and gases directly from the locomotive smoke-stack as well as the minor quantities of such smoke and gases as may tend to escape into the general space of the train shed, I preferably secure to the lower side of the frame structure carrying the smoke conduits and opposite each vertical wall of the latter downwardly and outwardly inclined guards or louvers 25 which have the effect of creating a shallow channel on the under side of each conduit. This latter feature, however, is not essential to the practical and successful working of the invention but constitutes simply a preferred accessory.

From the foregoing it will readily be seen how the structure and apparatus of the invention effect the several stated objects of the latter.

I am aware that it has heretofore been proposed to cover the central overhead slot of the modern type of train shed with a series of shutters to exclude the elements from the space beneath the train shed, and to operate these shutters by electrical means controlled by the locomotive as it enters and departs from the shed. My present invention is distinguished from such a system in that it provides a permanently closed roof or cover for the train shed and a smoke conduit located within said roof or cover with means for maintaining a constant vacuous condition in said smoke conduit for positively drawing off and delivering at any convenient point of discharge the smoke and gases, in lieu of merely delivering them into the atmosphere above the roof of the train shed. It will thus be apparent that by means of my invention the space directly over the tracks and above the part required for the handling of the trains is available for building purposes; and in large cities where building space is a factor of great value, my invention effects a pronounced economy to railroad companies in relation to their terminal and other stations. Moreover, it is apparent that the novel and simple valve mechanism for closing the bottom wall of the smoke conduit and the novel and simple valve-operating device mounted on the smoke-stack of the locomotive as herein shown and described are capable of general application not only to systems such as I have described, but also to systems employing simply a valve-closed slot in the roof of a train shed, tunnel, subway or the like; and hence, so far as this feature of the invention is concerned, I do not limit myself to its use in connection with a smoke conduit.

I claim—

1. In a smoke-abating system for railway stations, the combination of a smoke conduit extending above a railway track, means for

maintaining a vacuous condition therein, a series of normally closed valves in the bottom wall of said conduit, and means actuated by a locomotive on said track for opening said valves successively as it travels therebeneath.

2. In a smoke-abating system for railway stations, the combination of a smoke conduit extending above a railway track, means for maintaining a vacuous condition therein, a series of valves in the bottom wall of said conduit, means for maintaining said valves normally closed against the suction existing in the conduit, and means actuated by a locomotive on said track for opening said valves successively as it travels therebeneath.

3. In a smoke-abating system for railway stations, the combination of a smoke conduit extending above a railway track and having a longitudinal slot in its lower wall, a series of hinged shutter-valves normally closing said slot, means for maintaining a vacuous condition in said conduit, means for maintaining said valves normally closed against the suction existing in the conduit, and means actuated by a locomotive on said track for opening said valves successively as it travels therebeneath.

4. In a smoke-abating system for railway stations, the combination of a smoke conduit extending above a railway track and having a longitudinal slot in its lower wall, a series of shutter-valves hinged adjacent to one edge of said slot and extending transversely of the latter in edgewise overlapping relation, means for maintaining a vacuous condition in said conduit, means for maintaining said valves normally closed against the suction existing in the conduit, and means actuated by a locomotive on said track for opening said valves successively as it travels therebeneath.

5. In a smoke-abating system for railway stations, the combination of a track-shed having a longitudinal slot located centrally above a track, a series of valves normally closing said slot, and a shoe mounted on the smoke-stack of a locomotive for opening said valves successively as said locomotive travels therebeneath.

6. In a smoke-abating system for railway stations, the combination of a track-shed having a longitudinal slot located centrally above a track, a series of shutter-valves hinged adjacent to one edge of said slot and extending transversely of the latter, and a shoe mounted on the smoke-stack of a locomotive and having duplicate cam-shaped ends adapted to engage and open said valves successively as said locomotive travels therebeneath.

7. In a smoke-abating system for railway stations, the combination of a smoke conduit extending above a railway track, means for maintaining a vacuous condition therein, a series of normally closed valves in the bottom wall of said conduit and a shoe mounted on the smoke-stack of a locomotive for opening said valves successively as said locomotive travels therebeneath.

8. In a smoke-abating system for railway stations, the combination of a smoke conduit extending above a railway track, means for maintaining a vacuous condition therein, a series of normally closed valves in the bottom wall of said conduit and a shoe mounted on the smoke-stack of a locomotive and having duplicate cam-shaped ends adapted to engage and open said valves successively as said locomotive travels therebeneath.

9. In a smoke-abating system for railway stations, the combination of a smoke conduit extending above a railway track, means for maintaining a vacuous condition therein, a series of normally closed valves in the bottom wall of said conduit, a pair of outwardly and downwardly inclined louvers or guards on either side of said conduit below said bottom wall, and a shoe mounted on the smoke-stack of a locomotive for opening said valves successively as said locomotive travels therebeneath.

10. In a smoke-abating system for railway stations, the combination of a plurality of smoke conduits extending above railway tracks, respectively, a series of normally closed valves in the bottom wall of said conduits, means actuated by locomotives on said tracks for opening said valves successively, a smoke-chamber into which said conduits lead, a plurality of fans connected on their suction sides to said smoke-chamber, and a chimney communicating at its lower end with the discharge outlets of said fans.

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