

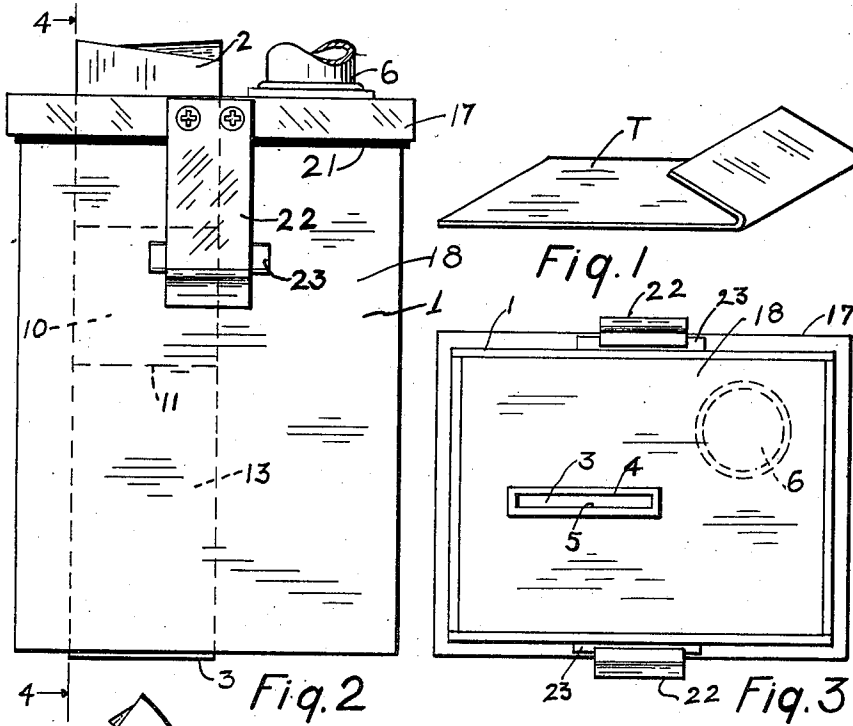
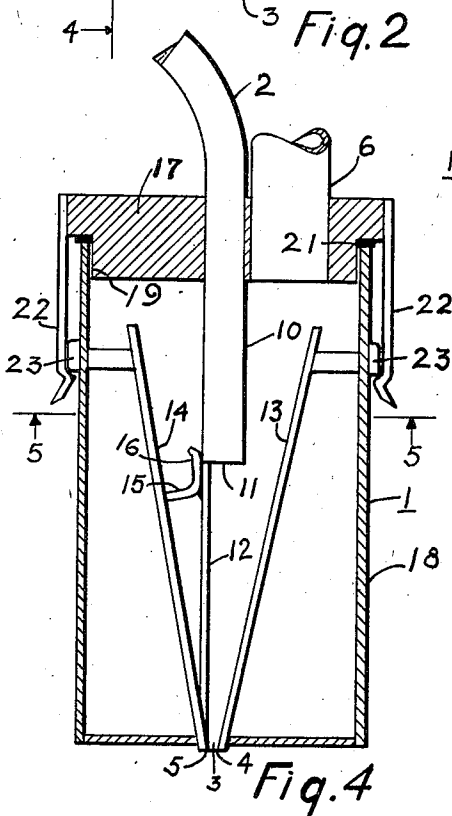
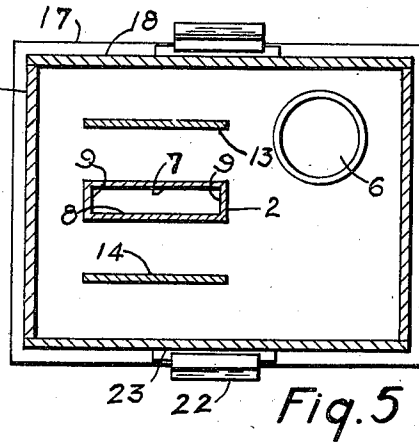
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W. L. WEIGELE

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TICKET TUBE TERMINAL

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Inventor

Walter L. Weigle

By

Jas. E. Britt

His Attorney

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TICKET TUBE TERMINAL

Walter L. Weigele, Cliffside Park, N. J., assignor
to Airmatic Systems, Inc., New York, N. Y., a
corporation of New York

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6 Claims. (Cl. 302—2)

This invention relates to terminals for pneumatic dispatch tube systems, and more particularly, to terminals for systems known as pneumatic ticket dispatch systems in which the ticket itself without any carrier therefor is the article being conveyed and usually has written upon it information which it is desired to transmit from one point to another. The ticket usually is formed of a rectangular piece of cardboard having a transverse crease or score spaced from one end so that the cardboard may be folded back along this crease to form what is termed as a "flag portion" behind which the air passing through the tube gathers to transport the ticket. The cross-section of the transit tube for this type of ticket is usually rectangular and of a size which would be filled with the ticket with its flag portion raised suitably to gather the air. Such systems may be operated to cause the air to travel through the tube by a means for producing a slight vacuum or a slight pressure upon the air fed into the system of tubes.

In the known systems of the prior art, more particularly, in the vacuum operated type of systems it is necessary to provide a terminal at the receiving point into which the ticket must be discharged where the influence of the air stream upon the ticket is diverted or separated from the ticket path and the air exhausted from the terminal. Heretofore, in the more simple type systems these tickets have been removed manually. If ticket operated automatic discharge is desired it has been necessary to contrive some delicate device which may be operated by the very small impact produced by the small mass or weight of the ticket as it is discharged into the terminal.

The principal object of this invention is to construct a discharge terminal for so-called ticket dispatch systems in which it is not necessary to incorporate any type of device or element which must be operated continuously or intermittently independent of the ticket or operated by or respond to the arrival of a ticket in the terminal and yet at the same time will automatically discharge the ticket from the terminal into the outside air.

According to this invention, in a pneumatic tube dispatch system of the character referred to, the ticket or other light article being transported is passed out of the end of the transit tube into the terminal along with the transporting air stream and the ticket guided beyond the influence of the air stream while at the same time the air stream is diverted to a return channel so that the ticket is not drawn to one side nor in

any manner diverted from its straight line path of travel. As the same ticket passes beyond the influence of the air stream at exit end of the transit tube it approaches a slot provided in the outside wall of the terminal housing. This slot remains open at all times but is substantially narrower than the cross-section of the tube and is in direct line with the travel of the ticket from the exit end of the transit tube. Guide means are provided approaching this slot which depresses the flag section of the ticket substantially down to the thickness of the flag and body section of the ticket. With the flag portion of the ticket depressed, the head resistance is so reduced that momentum of the ticket is sufficient to eject it through this narrow slot against the small air stream continually entering the terminal.

The object of the apparatus according to this invention is to automatically eject the tickets solely by virtue of their momentum.

Another object is to reduce the head resistance of the ticket as it approaches discharge to open air.

Still another object of this invention is to provide a continuously open discharge slot in the terminal with a reduced amount of air entering through the opening so that the momentum of the ticket will be sufficient to carry it through the discharge opening against the reduced air stream.

These and other objects will be apparent from the following description taken in connection with the accompanying drawing in which:

Fig. 1 is an isometric view of a typical form of ticket.

Fig. 2 is a view in elevation of the front side of the discharge housing.

Fig. 3 is a view in elevation of the end of the housing embodying the discharge slot; and

Fig. 4 is a sectional view taken along line 4—4 of Fig. 2.

Fig. 5 is a sectional view taken along line 5—5 of Fig. 4.

Referring now to the drawing, in general, the terminal comprises a closed box-like structure 1 into which a transit tube 2 enters at one side or end. At a point directly opposed to the outlet of the tube 2 a discharge slot 3 having opposed edges 4 and 5 is provided opening through the end of the housing to the atmosphere. Also connected to the housing is an exhaust tube 6 by means of which air entering the terminal through both transit tube 2 and discharge slot 3 is withdrawn by a suitable exhauster. A typical

ticket T of folded paper or cardboard or the like suitable for transmission is shown in Fig. 1.

The terminal 1 may be disposed in any suitable position, that is to say, either with the transit tube 2 entering the terminal along a horizontal line and discharging in a horizontal direction through a slot in substantially the same line or with the corresponding elements arranged in vertical relation.

More specifically the transit tube 2 is formed with a rectangular cross-section having opposite flat walls 7 and 8 and side walls 9, as viewed in Fig. 5. Also it is preferred that a small section 10 of the transit tube be enclosed to extend into the terminal 1 so as to give direction or aim to the ticket as it emerges from the exit end 11 of the tube even though the tube may be curved in its approach to the terminal. The slot 3 is located in the end wall of the housing at a point directly in line with the enclosed portion 10. The length of this slot, or in other words, the horizontal dimension as viewed in Fig. 3 is substantially the same as the corresponding dimension of the transit tube 2. However, the width of the slot, or in other words, the vertical dimension as viewed in Fig. 3 is considerably less than the corresponding dimension of the transit tube. This latter dimension is chosen such that it will accommodate the ticket with the flag portion bent down substantially in contact with the body portion, or in other words, a dimension equivalent to slightly over double the thickness of the material of which the ticket is formed.

In order to guide the ticket into the slot a guide or slide 12 in the form of a single plate or a plurality of bars extends from the exit terminus 11 all the way across to the outlet 3 with the upper surface of the slide as viewed in Fig. 4 forming a smooth continuation of the lower interior surface 8 of the tube merging with the lower edge 5 of the slot 3.

Opposed to the slide 12 is disposed another element 13 having a smooth surface with its outer end merging with the surface 4 of the slot 3 and disposed angularly with respect to slide 12 so that its inner end is spaced away from the slide a sufficient distance to permit the flag portion of the ticket to pass between the elements 12 and 13 without coming in contact with the inner end of the element 13. These two elements form a funnel-like structure which at the same time depresses the flag portion of a ticket being discharged and guides the head of the ticket into the slot 3 with very little friction.

An element 14 corresponding to 13 is preferably provided on the other side of the discharge slot. This permits flexibility in design and use. In the most simple form of the device the slide 12 may be omitted without making the terminal inoperative. On the other hand, the slide 12 may be secured to 14, directly at its outer end and by means of a bracket 15 at its inner end. The bracket 15 may be extended back and shaped to provide an alining guide 16 as shown in Fig. 4.

The stream of air emerging from the transit tube 2 is drawn backward toward the rear end of the housing and withdrawn through an exhaust tube 6. A relatively small amount of air will also normally enter the housing through the narrow slot 3 which air must also be withdrawn from the housing. The capacity of the exhaust line 6 is therefore arranged to take care of air from both sources.

Ordinarily the walls of the box forming the terminal housing will be in regular rectangular

form for facility of construction. However, they may be designed in any other desirable form. In order to give access to the housing for removing any tickets which may arrive in a condition unsuitable to pass through the discharge opening 3, it is preferred to divide the terminal 1 into a fixed base or head portion 17 and a removable body portion 18. The head 17 may depend for its security on its junction with tubes 2 and 6 or it may be provided with additional security by a suitable bracket. The head is undercut around its perimeter to provide a recessed portion 19 around which the body 18 may fit. A gasket 21 or other suitable means may be employed to provide a substantially air tight joint.

The body is held in place by means permitting easy removal. This may comprise clips 22 extending down from the opposite sides of head 17 and engaging bosses 23 secured to the sides of the body. The coacting surfaces of the clips and bosses are arranged so that pulling on the body will disengage the clips and permit the body to be removed. The body may be reassembled by pushing it up to its original position between the clips which due to their shape slide over the bosses and engage them as illustrated in Fig. 4 to retain the body in assembled position. With this arrangement the terminal may be readily opened for examination or for removal of any tickets which because of their imperfections or otherwise have failed to discharge. In addition the construction is such that the body may be reassembled with either side to the front if desired.

In order to provide for readily determining when some of the tickets have failed to be discharged a portion or all of the housing may be made of transparent material. For instance, a part or all of the side walls of the body 18 and the guides may be made of transparent material. Another arrangement might be to use transparent material for the portion of the side walls of the housing giving a view edgewise into the funnel area between guides 12 and 13 and into other parts of the housing.

In order to provide for the most ready diversion and arrestment of the air from the funnel section included between guides 12 and 13 it is desired that the housing should be of sufficient width to provide considerable space at each side of this area so that the air may emerge sideways in both directions and travel towards the rear of the terminal to the exhaust outlet 6. If it is desired that the exhaust line should be disposed at the side of the dispatch tube 2, instead of above or below, it will readily be seen that this may be provided for by increasing the width of the housing horizontally as viewed in Fig. 3. This would naturally provide a larger area at one side of the funnel surfaces above referred to and would cause the discharge slot 3 to be located to one side instead of in the center of the front surface.

In its preferred form it is desired that the volume of the space enclosed within the terminal housing be relatively large. In this manner the streams of air entering the housing are largely arrested or absorbed in the large space enclosed, thus providing an area of relatively small air travel through which the ticket passes from the terminal 11 of the transit tube to the discharge slot 3.

In operation a ticket T such as illustrated in Fig. 1 is introduced into the transit tube at a

sending point and is carried at high speed along the tube by the rapidly traveling stream of air being drawn therethrough. The ticket travels along the tube with its body portion in engagement with the lower flat side 8 of the tube and the flag portion raised at an angle to bring the upper end of it in engagement with the opposite flat side 7 of the tube. As the ticket emerges from the tube the flag portion will tend to rise slightly as the expanding stream emerges from the terminal of the transit tube. This is not an objectionable action but would utilize the expanding stream at the exit in speeding up or at least maintaining the speed of the ticket as it leaves the tube. However, as the air stream emerges into the large enclosed space of the terminal the air stream will be arrested by mingling with the enclosed air as it emerges at the sides of the space between the guides 12 and 13 as well as at the space between the end of the guide 13 and the terminus 11 of the tube.

Meantime, air is all the while entering the restricted slot 3 but this stream is in like manner reduced in speed upon entering the relatively large enclosed terminal space. At the same time the ticket proceeds toward the discharge slot 3 under its own momentum due to its speed of exit from the tube and the extra puff given it by the expanding air stream leaving the tube. With the body section of the tube and the extended guide surface 12 aimed at the discharge slot, the surface 13 by reason of its angular position with respect to surface 12 bends down the flag portion of the ticket as it proceeds, reducing its head resistance to the air in front of it. Thus prepared and acted upon the momentum of a cardboard or like ticket easily carries it through the narrow discharge slot 3 against the incoming air.

Employing a narrowed or restricted slot as a discharge opening in connection with a wedge or funnel shaped arrangement of guide surfaces accomplishes two results contributing toward the smooth and efficient operation of the invention. Here the primary result is the reduction of the amount of air necessarily entering the terminal through a restricted opening or discharge slot making it easier to check this air stream. The second result is reducing head resistance of the ticket to air entering the slot by folding down of the flag section to such a point that the momentum of the ticket, even though it is constructed of relatively light weight material, is ample to carry the ticket through the discharge slot against the entering small air stream.

From the foregoing description it will be seen that a terminal for use in ticket dispatch systems has been provided which will operate to discharge tickets constructed of light weight material such as card board out into the open atmosphere from a system employing a slight vacuum to produce the transporting air stream through the system. It will be further seen that such a discharge of the tickets is accomplished in a terminal which does not employ any devices which must respond to the arrival of the ticket in order that the discharge may be accomplished. Such an arrangement provides a terminal of a relatively simple structure and which may be constructed of parts which will not easily get out of order. Such a terminal will give practically unlimited service without replacement or renewal of parts.

While this invention has been shown in but one form it will be apparent to those skilled in the art that it may be embodied in various other forms and modifications without departing from

the spirit thereof and it is desired therefore that only such limitations shall be placed thereon as set forth in the appended claims.

What I claim is:

1. In a terminal for a pneumatic dispatch system for tickets, an exhaust housing, an air exhaust line leading from said housing, a dispatch tube having a rectangular cross-sectional area of predetermined length and width having its terminus disposed within the housing, the wall of the housing opposite the terminal of the dispatch tube having a slot therein with a width substantially less than the corresponding dimension of the dispatch tube, and guide means within the housing forming a path for guiding a ticket from the outlet end of the dispatch tube through said slot, said guide means being formed by elements embodying surfaces which decrease the width of the path as it approaches the slot.

2. In a terminal for a pneumatic ticket dispatch system for dispatching tickets comprised of a flat strip having a body portion and an upstanding flag portion formed by bending a length of the strip at one end back toward the body portion, an exhaust housing, an air exhaust line leading from said housing, a rectangular dispatch tube arranged to enter through one wall of said housing, said tube being formed with a suitable cross-sectional area having a predetermined length corresponding to the width of the strip forming said ticket and a predetermined width corresponding to the height of said ticket with its flag raised to conveying position, the opposite wall of said housing being provided with a discharge opening having a length corresponding to the width of the ticket and a width suitable for the passage of the ticket therethrough with its flag portion bent backwardly substantially in contact with the body portion, said discharge opening and the terminus of said dispatch tube being separated by an air space enclosed within the housing in which air streams entering the housing both from the dispatch tube and the discharge opening are intermingled and dispersed, a length of the dispatch tube adjacent to its terminus being formed straight and aimed at said opening, and opposed guide means extending inwardly from the upper and lower edges respectively of the discharge opening and diverging from each other so that a ticket shot at the opening will be engaged between the guides and have its flag portion bent downwardly substantially into engagement with its body portion as it approaches said opening.

3. A terminal according to claim 2 in which the entering dispatch tube, the discharge slot, and the guides cooperating therewith are spaced away from the side walls of the housing to provide a dispersing air space on both sides, above and underneath.

4. A terminal according to claim 2 in which one side of the dispatch tube and the guide means corresponding to that side together with the corresponding side of the discharge opening are all disposed in alinement, so that a ticket placed in the tube to be discharged through the terminal with its body portion disposed to travel along the above named elements will have said body portion maintained in a normal straight line of travel while its flag portion is being lowered by the opposed guide surface as the ticket approaches the discharge opening.

5. In a terminal for a pneumatic dispatch system, an exhaust housing, an air exhaust line leading from said housing, a dispatch tube having its

terminal portion disposed within the housing and directed toward an opposing wall and spaced therefrom, an outlet opening in said wall in line with the terminal portion and having an area restricted relative to the terminal cross sectional area, guide means spanning the space between the tube terminal and the outlet, said guide means forming a path converging to the area of the outlet opening and embodying open areas providing for diversion of the air streams entering the housing from said path to the air exhaust line.

6. A terminal according to claim 5 in which access to the interior of the exhaust housing is provided by forming the housing in two parts consisting of a fixed head portion through which the dispatch tube and the air exhaust line enter the housing and a body portion removably secured to the head portion.

WALTER L. WEIGELE.