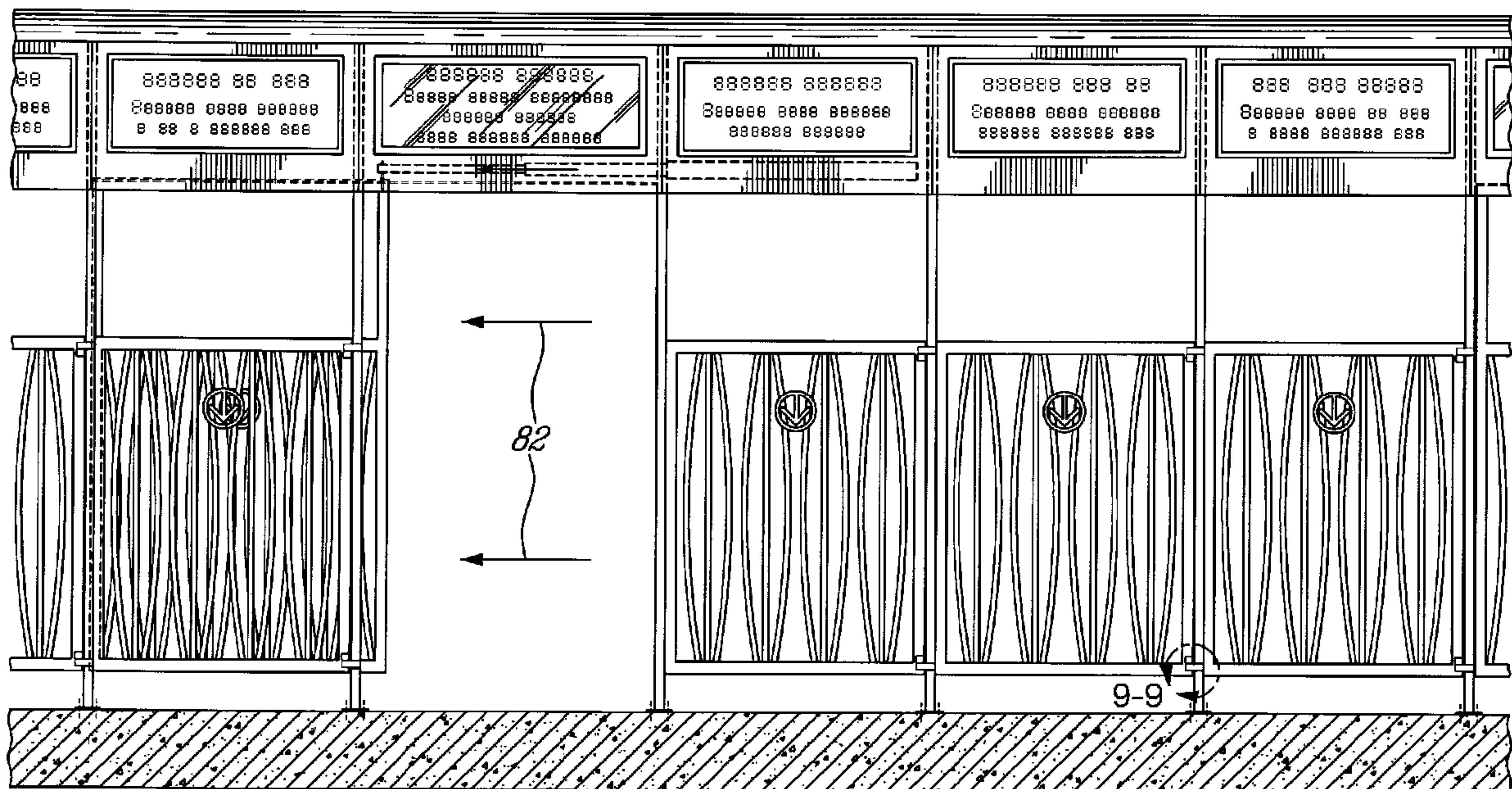




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(54) Title: SAFETY GATE SYSTEM FOR A SUBWAY PLATFORM



(57) Abrégé/Abstract:

A security gate system for subway platforms where sliding gates are mounted to header assemblies so as to slide between open and closed positions to allow or block passage to subway users is described herein.

ABSTRACT OF THE DISCLOSURE

A security gate system for subway platforms where sliding gates are mounted to header assemblies so as to slide between open and closed positions to allow or block passage to subway users is described herein.

TITLE

Safety gate system for a subway platform

FIELD

[0001] The present invention generally relates to safety gates. More specifically, the present invention is concerned with a safety gate system for a subway platform.

BACKGROUND

[0002] Safety gates for railway systems are known in the art. They are generally installed on the raised platforms where passengers enter or egress the railway vehicles. The purpose of safety gate systems is generally to prevent passengers from falling from the raised platform onto the rails when the railway vehicle is not at the station.

[0003] An example of such a safety gate system is described in United States Patent number 5,669,588 issued to Michael A. Goldsmith on September 23, 1997 and entitled "Motion Barrier". The system described by Goldsmith includes a barrier that is lowered automatically by the incoming railway vehicle.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] In the appended drawings:

[0005] Figure 1 is a front sectional view of a subway station provided with a safety gate system according to a first illustrative embodiment;

[0006] Figure 2 is a front elevation view of a portion of the safety gate system of Figure 1 when the subway is not present at the station;

[0007] Figure 3 is a front elevation view similar to Figure 2, showing a slidable safety gate in an open position;

[0008] Figure 4 is a sectional view taken along line 4-4 of Figure 2;

[0009] Figure 5 is a sectional view taken along line 5-5 of Figure 2;

[0010] Figure 6 is a top plan view of the safety gate system portion of Figure 2;

[0011] Figure 7 is an enlargement of portion 7-7 of Figure 6;

[0012] Figure 8 is an enlargement of portion 8-8 of Figure 6;

[0013] Figure 9 is an enlargement of portion 9-9 of Figure 2;

[0014] Figure 10 is a front elevation view of a portion of a safety gate system according to a second illustrative embodiment;

[0015] Figure 11 is a front elevation view similar to Figure 10, showing a slidable safety gate in an open position;

[0016] Figure 12 is a front elevation view of a portion of a safety gate system according to a third illustrative embodiment; and

[0017] Figure 13 is a front elevation view similar to Figure 12, showing a slidable safety gate in an open position.

DETAILED DESCRIPTION

[0018] An object is generally to provide an improved safety gate system for subway platform. More specifically, according to an illustrative embodiment, there is provided a safety gate system for subway platform; the safety gate system including: a plurality of posts anchored to the subway platform; a header assembly mounted between two adjacent posts of the plurality of posts; a gate so mounted to the header assembly as to reciprocally slide between a closed position where the gate closes the space between two adjacent posts and an open position where the gate leaves the space between two adjacent posts open; wherein the header assembly includes a gate actuating mechanism associated with the gate to reciprocally move the gate between the closed position and the open position.

[0019] According to another illustrative embodiment, there is provided a safety gate system for subway platform; the safety gate system including: a plurality of posts fixedly anchored to the subway platform; a first header assembly mounted between a first and a second posts of the plurality of posts; a second header assembly mounted between the second post and a third post of the plurality of posts; a gate so mounted to the first header assembly as to reciprocally slide between a closed position where the gate closes the space between the first and second posts and an open position where the gate leaves the space between the first and second posts open; a gate actuating mechanism associated with one of the first and second header assemblies; the gate actuating mechanism being associated with the gate to reciprocally slide the gate between the closed position and the open position.

[0020] The use of the word “a” or “an” when used in conjunction with the term “comprising” in the claims and/or the specification may mean “one”, but it is also consistent with the meaning of “one or more”, “at least one”, and “one or more than one”. Similarly, the word “another” may mean at least a second or more.

[0021] As used in this specification and claim(s), the words “comprising” (and any form of comprising, such as “comprise” and “comprises”), “having” (and any form of having, such as “have” and “has”), “including” (and any form of including, such as “include” and “includes”) or “containing” (and any form of containing, such as “contain” and “contains”), are inclusive or open-ended and do not exclude additional, unrecited elements or process steps.

[0022] It is to be noted that the term “subway” is to be construed herein and in the appended claims as any railway vehicle such as, for example trains, underground subways, above ground subways and tramways.

[0023] It is also to be noted that the term “platform” is to be construed herein and in the appended claims as any elevated surface that is generally horizontal and positioned along a railway to allow passenger and other cargo in and/or out of the railway vehicle.

[0024] Other objects, advantages and features of the present invention will become more apparent upon reading of the following non-restrictive description of illustrative embodiments thereof, given by way of example only with reference to the accompanying drawings.

[0025] Generally stated an illustrative embodiment is concerned with a security gate system for subway platforms where sliding gates are mounted to header assemblies so as to slide between open and closed positions to allow or block passage to subway users. Accordingly, the gates can be closed when the subway is not in the station and open when the subway is in the station.

[0026] Figure 1 of the appended drawings is a front sectional view of a subway station provided with a safety gate system 20 according to a first illustrative embodiment for each subway track 22 and 24.

[0027] Figure 2 is a front elevation view of a portion of one of the safety gate system 20 when the subway is not present at the station. The gate system 20 includes a plurality of posts 26, 28 fixedly mounted to the platform 30 via fasteners 32. The posts 26 and 28 support two different configurations of header assemblies 34 and 36.

[0028] The safety gate system 20 also includes sliding gates 38 and pivotable gates 40. Each sliding gate 38 is slidably mounted to a corresponding header 34 as will be described hereinbelow. Each pivotable gate 40 is pivotally mounted to a corresponding post 28 as will be described hereinbelow.

[0029] Turning now to Figure 4 of the appended drawings, a header 34 supporting a sliding gate 38 will be described. As can be seen from this sectional figure, the header 34 is supported by two posts (only one post 26 shown) and is generally hollow, defining a chamber 41 housing a portion of a gate actuating mechanism in the form of a cylinder/piston assembly 42, a pair of LCD screens 44, 46, lighting equipment in the form of a light bulb 48 and a control compartment 50.

[0030] As can be seen from this figure, the gate 38 has a structure made of tubular elements such as 52 and has a generally flat top plate 54. The gate 38 is provided on the rear portion of the header 34, i.e. close to the subway rails. The base 55 of the header 34 includes a longitudinal opening 56 allowing the gate 38 therethrough. A shoulder 58, integral with the base 55 of the header 34, supports the weight of the gate 38 when it is in a closed position. Since the gate 38 is a sliding gate, strips of friction reducing material 60, such as TeflonTM are provided between the flat top plate 54 and the shoulder 58.

[0031] In the illustrative embodiment shown in Figure 4, the base 55 of the header 34 is made of sheet stainless steel that is cut and bent so that the shoulder 58 is integral therewith.

[0032] One skilled in the art will easily understand that other structures could be used to support the gate 38 in the header 34 while allowing the sliding movements of the gate 38 with respect to the header 34.

[0033] The cylinder/piston assembly 42, includes a cylinder 62 mounted to the header 36 that is adjacent to the header 34 (see Figure 2), and a piston 64 mounted to the top flat plate 54 via a fastener 66. Accordingly, telescoping movements of the piston 64 in the cylinder 62 cause the sliding movements of the gate 38.

[0034] The LCD screens 44 and 46 are mounted to a common pivot element 68 via brackets 70. This allows the angle of the screens 44 and 46 to be adjusted for optimal viewing. Of course, while two LCD screens are shown herein, only one screen could be used. In that case, another advertizing media can be used on the side lacking a LCD screen.

[0035] Lighting equipment in the form of a light bulb 48 is also provided in the header 34. This lighting equipment may be, for example, emergency lighting equipment.

[0036] A control compartment 50 houses the mechanical, electrical and data connections of the LCD screens 44 and 46, of the lighting equipment and of the cylinder/piston assembly 42.

[0037] As will easily be understood by one skilled in the art, the cylinder/piston assembly 42 may be a hydraulic or a pneumatic assembly.

[0038] Turning now to Figure 5 of the appended drawings, a portion of the safety gate system provided with a pivotable gate 40 will be described. As can be seen from this figure, the pivotable gate is provided at a front portion of the post 28, i.e. closer to the passenger platform. Accordingly, the sliding gate 38 may slide behind the pivotable gate 40, as can be seen from Figure 6.

[0039] The pivotable gate 40 is made of tubular material such as 72.

[0040] The header 36 is generally hollow and includes a longitudinal opening 56 allowing the sliding gate 38 therethrough when it is in an open position. A shoulder 58, integral with the base 55 of the header 34, supports the weight of the gate 38 when it is in an open position. Again, since the gate 38 is a sliding gate, strips of friction reducing material 60, such as TeflonTM is provided between the flat top plate 54 and the shoulder 58.

[0041] Advertisement spaces, for example advertisement panels 86 and 88 are provided on either sides of the header 36. Of course, these

advertisement panels could be replaced by LCD screens as illustrated in Figure 4.

[0042] Lighting equipment in the form of a light bulb 48 is also providing in the header 36. This lighting equipment may be, for example, emergency lighting equipment.

[0043] Turning now to Figures 6, 8 and 9 of the appended drawings, the pivoting gate 40 is mounted to a post 28 via a bottom hinge 74 (Figure 9) and a top hinge 76 (Figure 8), both mounted to the post 28. The post 28 also includes an optional stopper 78 to properly position the gate 40 when it is in a closed position.

[0044] Similarly, Figure 7 illustrates a post 26 including an integral stopper 80 against which the sliding gate 38 may rest when in a closed position.

[0045] Returning to Figure 6 of the appended drawings, the various movements of the gates 38 and 40 are illustrated in a top plan view. Arrow 82 shows the sliding movements of one of the gates 38 while arrows 84 show the pivoting movements of the gates 40. It is to be noted that the headers 34 and 36 have been omitted from this figure for clarity.

[0046] In operation, when the subway is not in the station, the sliding gates 38 are in their closed positions as illustrated in Figure 2. When the subway is stopped at the station, the subway doors (not shown) are aligned with the sliding gates 38 which are opened by the gate actuating mechanism 42 as illustrated in Figure 3 (see arrows 82).

[0047] The sliding operation of the gates 38 may be manually controlled by the subway controlling authority, by the subway operator (for example by linking the gate 38 operation with the subway door operation), or by an automated control system (not shown) using sensors to detect the presence of the subway in the station.

[0048] It is to be noted that the pivotable gates 40 are kept closed since they are not aligned with the subway doors. These pivotable doors 40 are provided for emergency situations, for example, should the subway fail to reach its conventional position along the platform 28. The pivotable gates may be provided with a remote controlled locking mechanism (not shown) operable by the subway controlling authority in emergency situations. Alternatively, conventional locking mechanisms, such as padlocks (not shown), may be used to lock the pivotable gates 40 in their closed position.

[0049] Turning now to Figures 10 and 11 of the appended drawings, a safety gate system 100 according to a second illustrative embodiment will be described. It is to be noted that since the safety gate system 100 is very similar to the safety gate system 20 illustrated in Figures 1-9 and described hereinabove, only the differences therebetween will be described hereinbelow, for concision purpose.

[0050] Generally stated, the main difference between the safety gate system 20 and the safety gate 100 resides in the gate sliding mechanism. As can be seen from Figure 10, the gate sliding mechanism 102 is entirely enclosed in the header 34 when the gate 38 is in the closed position shown in Figure 10.

[0051] The gate sliding mechanism 102 therefore includes a cylinder 104 mounted in the header 36 and a telescoping piston 106 mounted to the sliding gate 38.

[0052] As can be seen from Figure 11, when the piston 106 moves the gate 38 from the closed position to the open position (see arrows 82), the piston 106 enters the adjacent header 36.

[0053] Turning now to Figures 12 and 13 of the appended drawings, a safety gate system 200 according to a second illustrative embodiment will be described. It is to be noted that since the safety gate system 200 is very similar to the safety gate system 20 illustrated in Figures 1-9 and described hereinabove, only the differences therebetween will be described hereinbelow, for concision purpose.

[0054] Generally stated, the main difference between the safety gate system 20 and the safety gate 200 resides in the gate sliding mechanism. As can be seen from Figure 12, the gate sliding mechanism 202 consists in a rack 204 mounted to the flat plate 54 and a pinion and motor assembly 206 mounted to the header 34. Again, the gate sliding mechanism 202 is entirely enclosed in the header 34 when the gate 38 is in the closed position shown in Figure 12.

[0055] As can be seen from Figure 13, when the pinion and motor assembly 206 rotates (see arrow 208), the interconnection of the pinion and the rack 204 moves the gate 38 from the closed position to the open position (see arrows 82). Of course, the rack 204 enters the adjacent header 36.

[0056] As will easily be understood to one skilled in the art, the various elements of the safety gate systems described hereinabove are advantageously made of corrosion resistant material such as stainless steel.

[0057] It is also to be noted that the design and structure of the gates as well as the header structure that allows for the gate to slide therein could be modified by one skilled in the art.

[0058] Similarly, other gate actuating mechanisms using hydraulic, pneumatic and/or mechanical actuators could be used.

[0059] It is to be understood that the invention is not limited in its application to the details of construction and parts illustrated in the accompanying drawings and described hereinabove. The invention is capable of other embodiments and of being practiced in various ways. It is also to be understood that the phraseology or terminology used herein is for the purpose of description and not limitation. Hence, although the present invention has been described hereinabove by way of illustrative embodiments thereof, it can be modified, without departing from the spirit, scope and nature of the subject invention as defined in the appended claims.

WHAT IS CLAIMED IS:

1. A safety gate system for subway platform; the safety gate system including:

a plurality of posts anchored to the subway platform;

a header assembly mounted between two adjacent posts of the plurality of posts;

a gate so mounted to the header assembly as to reciprocally slide between a closed position where the gate closes the space between two adjacent posts and an open position where the gate leaves the space between two adjacent posts open;

wherein the header assembly includes a gate actuating mechanism associated with the gate to reciprocally move the gate between the closed position and the open position.

2. The safety gate system recited in claim 1, wherein the header assembly further includes advertisement space.

3. The safety gate system recited in claim 2, wherein the advertisement space includes a LCD screen.

4. The safety gate system recited in claim 1, wherein the gate actuating mechanism includes an actuator.

5. The safety gate system recited in claim 4, wherein the actuator is selected from the group consisting of hydraulic actuators, pneumatic actuators and mechanical actuators.

6. The safety gate system recited in claim 4, wherein the actuator includes a cylinder mounted to the header assembly and a telescoping piston associated with the cylinder and mounted to the gate.

7. The safety gate system recited in claim 4, wherein the actuator includes a rack and pinion assembly mounted between the gate and the header.

8. The safety gate system recited in claim 7, wherein the rack and pinion assembly includes a rack mounted to the gate and a pinion associated with a motor and mounted to the header assembly.

9. The safety gate system recited in claim 1, wherein the header assembly includes a base portion provided with a longitudinal aperture allowing the gate therethrough, the longitudinal aperture defining a longitudinal shoulder; and wherein the gate is provided with a top plate so configured and sized as to rest onto the longitudinal shoulder.

10. The safety gate system recited in claim 9, further comprising friction reducing material provided between the top plate of the gate and the longitudinal shoulder of the header.

11. The safety gate system recited in claim 1, further comprising a pivotable gate mounted between two adjacent posts of the plurality of posts.

12. The safety gate system recited in claim 11, wherein the pivotable gate is mounted to a corresponding one of the plurality of posts via a top and a bottom hinge.

13. The safety gate system recited in claim 1 wherein the plurality of posts and the gate are made of stainless steel.

14. The safety gate system recited in claim 1, wherein the header includes lighting equipment.

15. A safety gate system for subway platform; the safety gate system including:

a plurality of posts fixedly anchored to the subway platform;

a first header assembly mounted between a first and a second posts of the plurality of posts;

a second header assembly mounted between the second post and a third post of the plurality of posts;

a gate so mounted to the first header assembly as to reciprocally slide between a closed position where the gate closes the space between the first and second posts and an open position where the gate leaves the space between the first and second posts open;

a gate actuating mechanism associated with one of the first and second header assemblies; the gate actuating mechanism being associated with the gate to reciprocally slide the gate between the closed position and the open position.

16. The safety gate system recited in claim 15, wherein the second header assembly further includes advertisement space.

17. The safety gate system recited in claim 15, wherein the first header assembly further includes a LCD screen.

18. The safety gate system recited in claim 15, wherein the gate actuating mechanism includes an actuator.

19. The safety gate system recited in claim 18, wherein the actuator is selected from the group consisting of hydraulic actuators, pneumatic actuators and mechanical actuators.

20. The safety gate system recited in claim 18, wherein the actuator includes a cylinder mounted to the second header assembly and a telescoping piston associated with the cylinder and mounted to the gate.

21. The safety gate system recited in claim 18, wherein the actuator includes a cylinder mounted to the first header assembly and a telescoping piston associated with the cylinder and mounted to the gate.

22. The safety gate system recited in claim 18, wherein the actuator includes a rack and pinion assembly mounted between the gate and the first header.

23. The safety gate system recited in claim 22, wherein the rack and pinion assembly includes a rack mounted to the gate and a pinion associated with a motor and mounted to the first header assembly.

24. The safety gate system recited in claim 15, wherein the first and second headers assembly each includes a base portion provided with a longitudinal aperture allowing the gate therethrough, the longitudinal aperture defining a longitudinal shoulder; and wherein the gate is provided with a top plate so configured and sized as to rest onto the longitudinal shoulder.

25. The safety gate system recited in claim 24, further comprising friction reducing material provided between the top plate of the gate and the longitudinal shoulder of the first and second headers.

26. The safety gate system recited in claim 115, further comprising a pivotable gate mounted between the second and third post.

27. The safety gate system recited in claim 26, wherein the pivotable gate is mounted to a corresponding one of the plurality of posts via a top and a bottom hinge.

28. The safety gate system recited in claim 15 wherein the plurality of posts and the gate are made of stainless steel.

29. The safety gate system recited in claim 15, wherein first and second headers include lighting equipment.

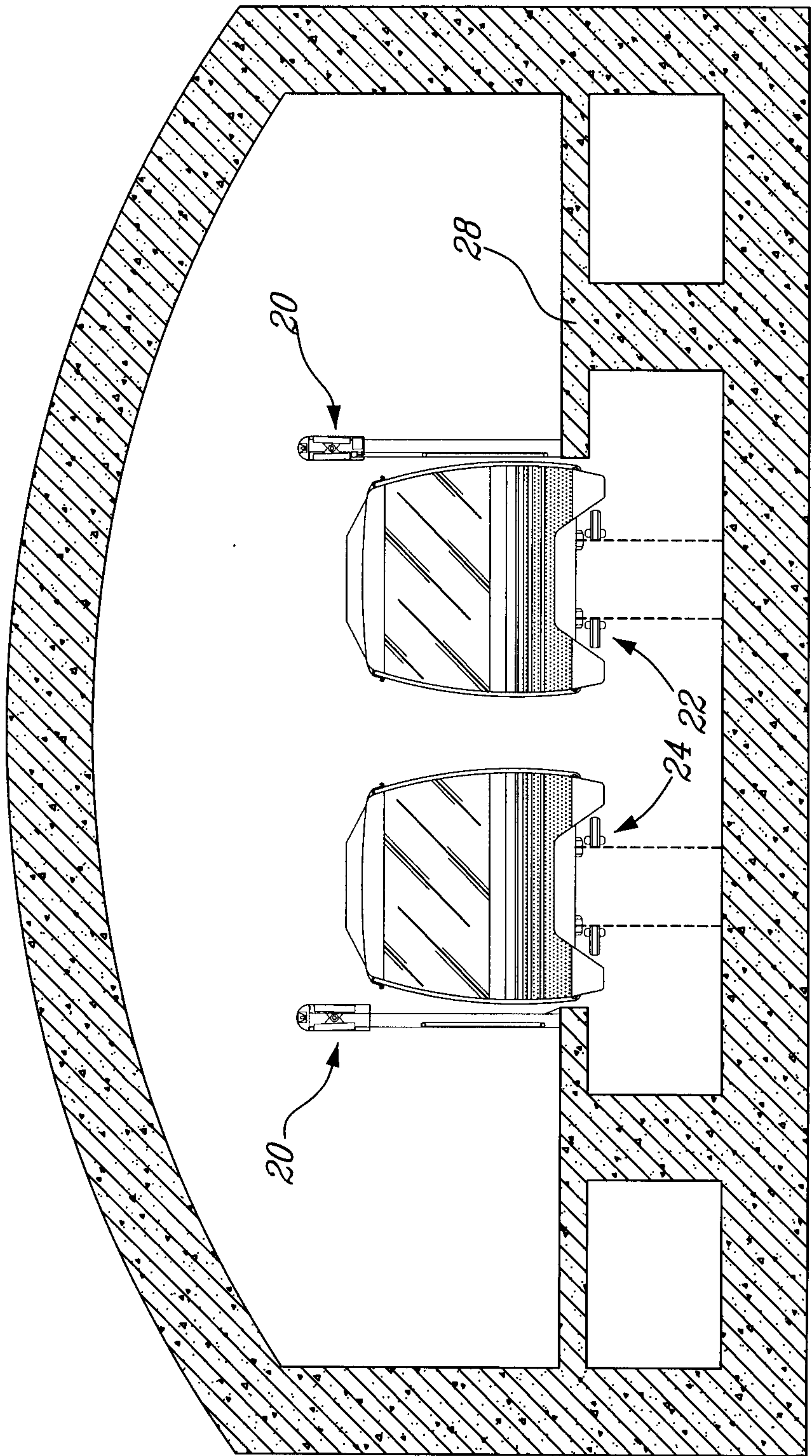
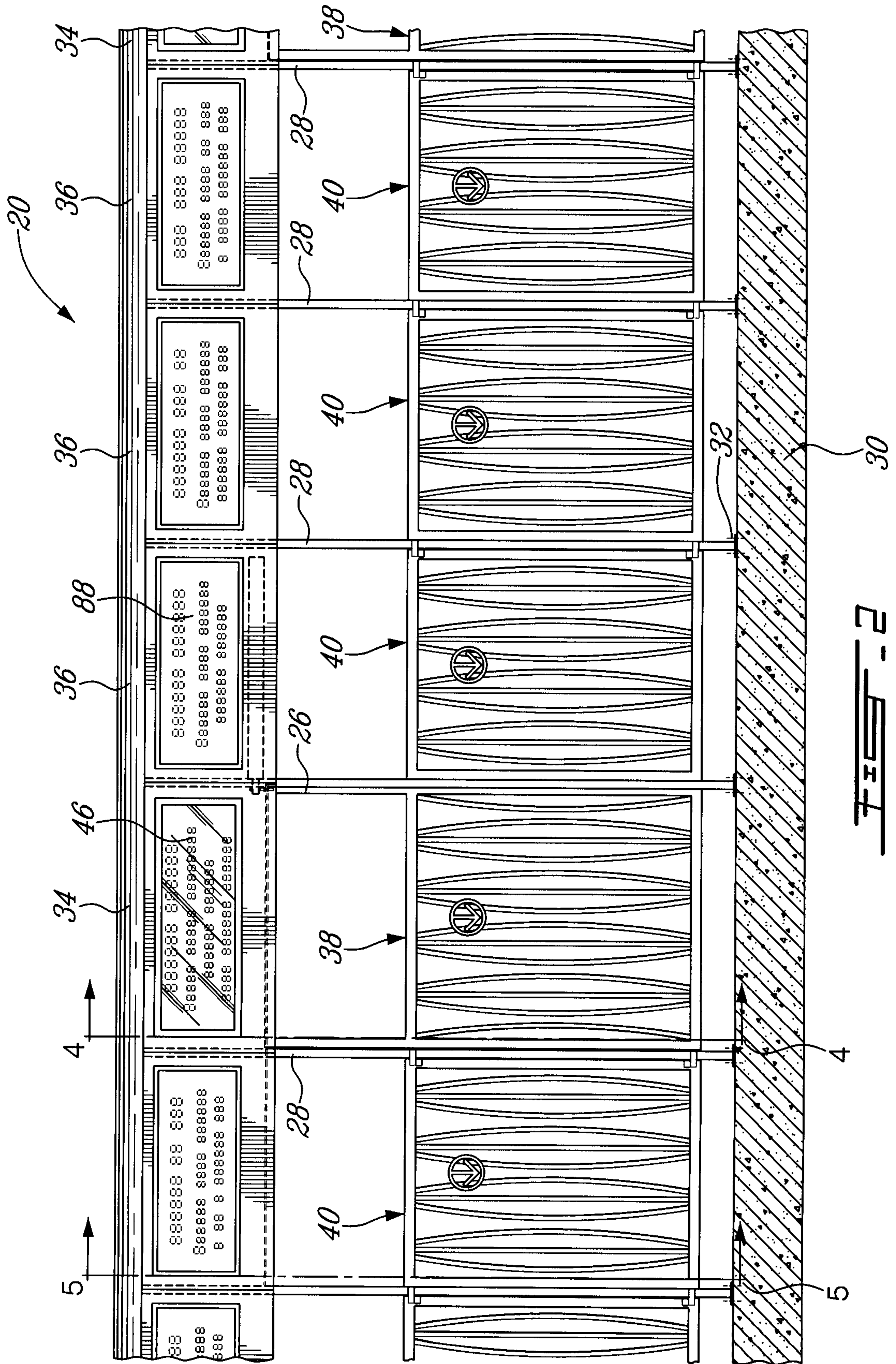


FIG. 1

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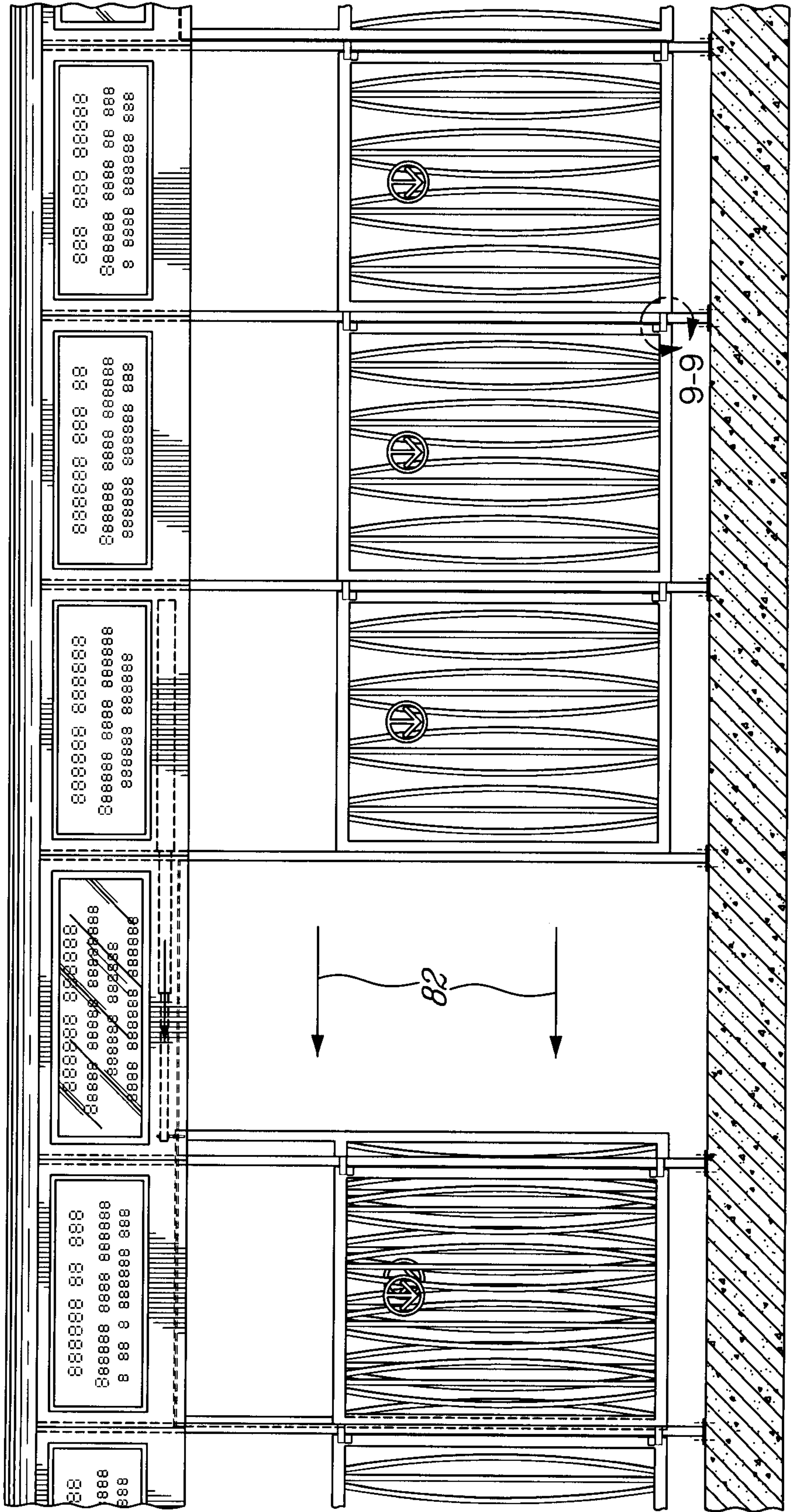
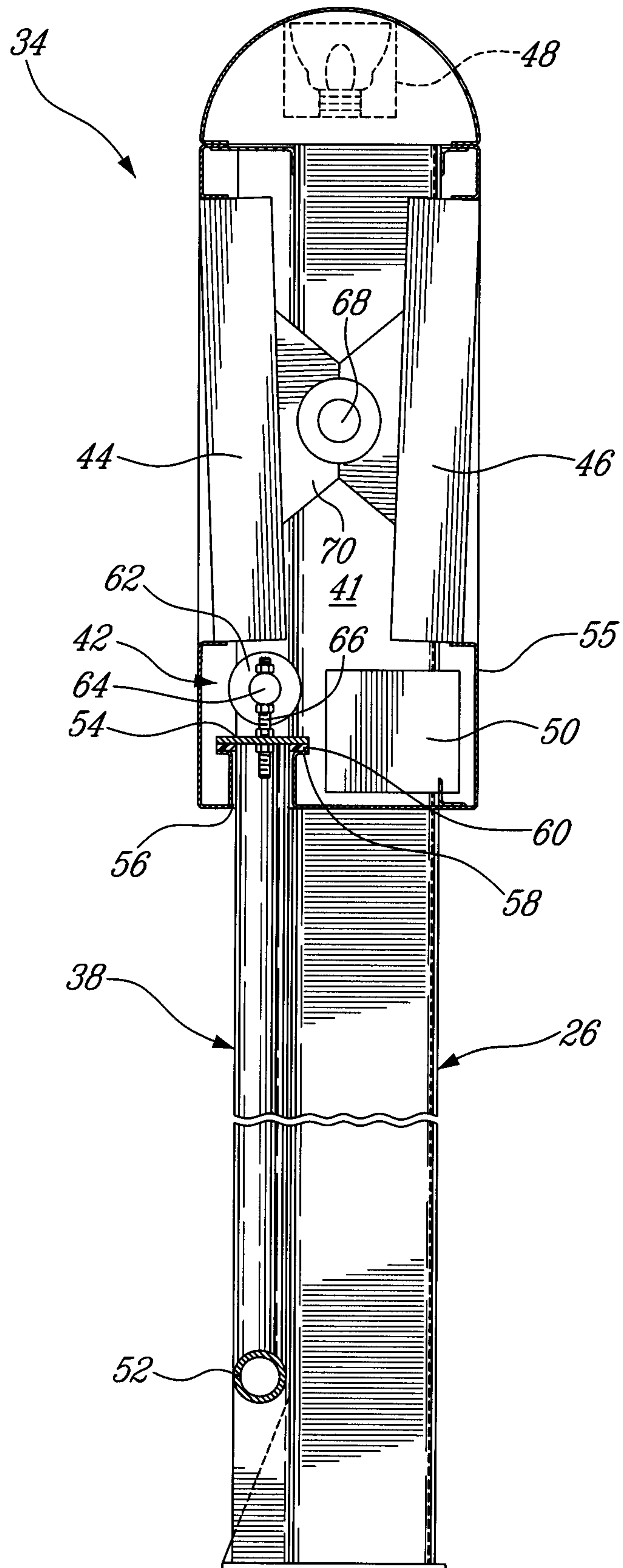
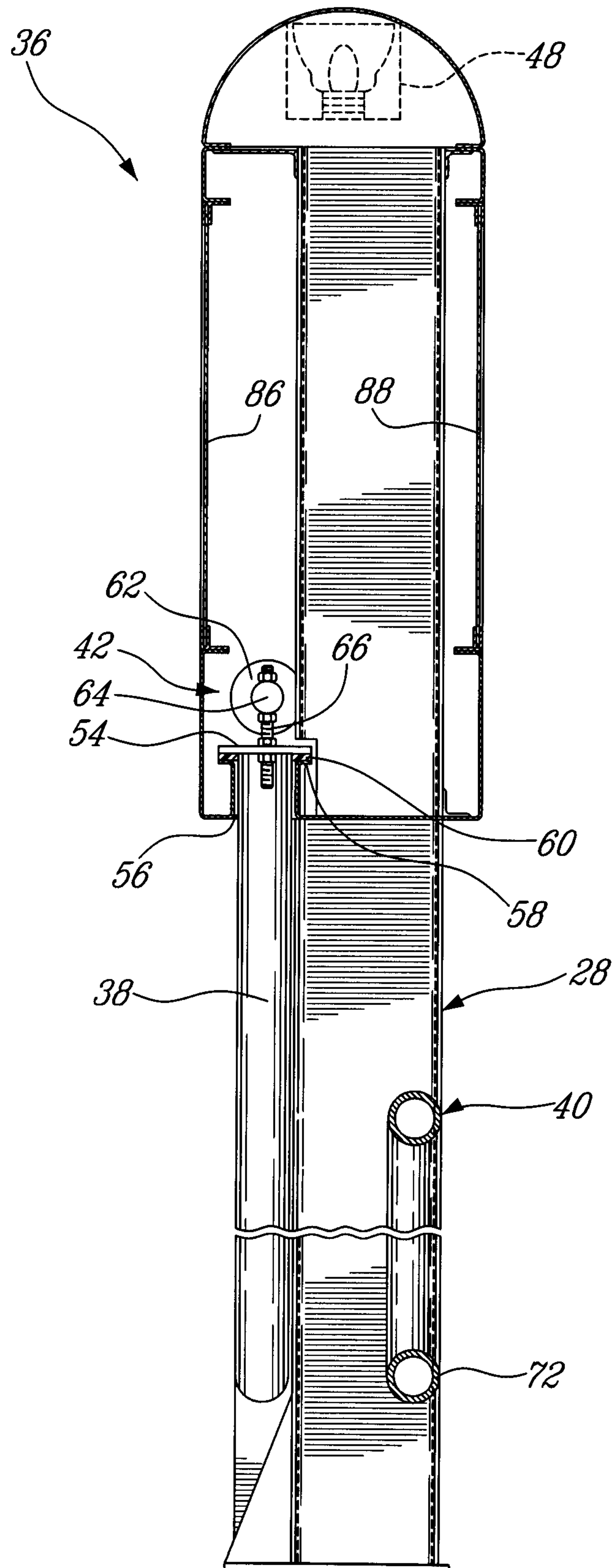


Fig. 3

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FIG. 4

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FIG. 5

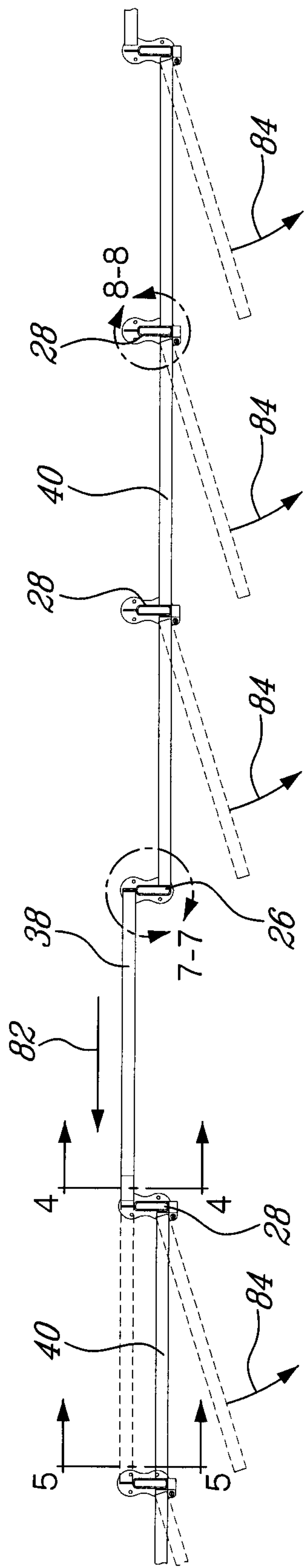


Fig. 6

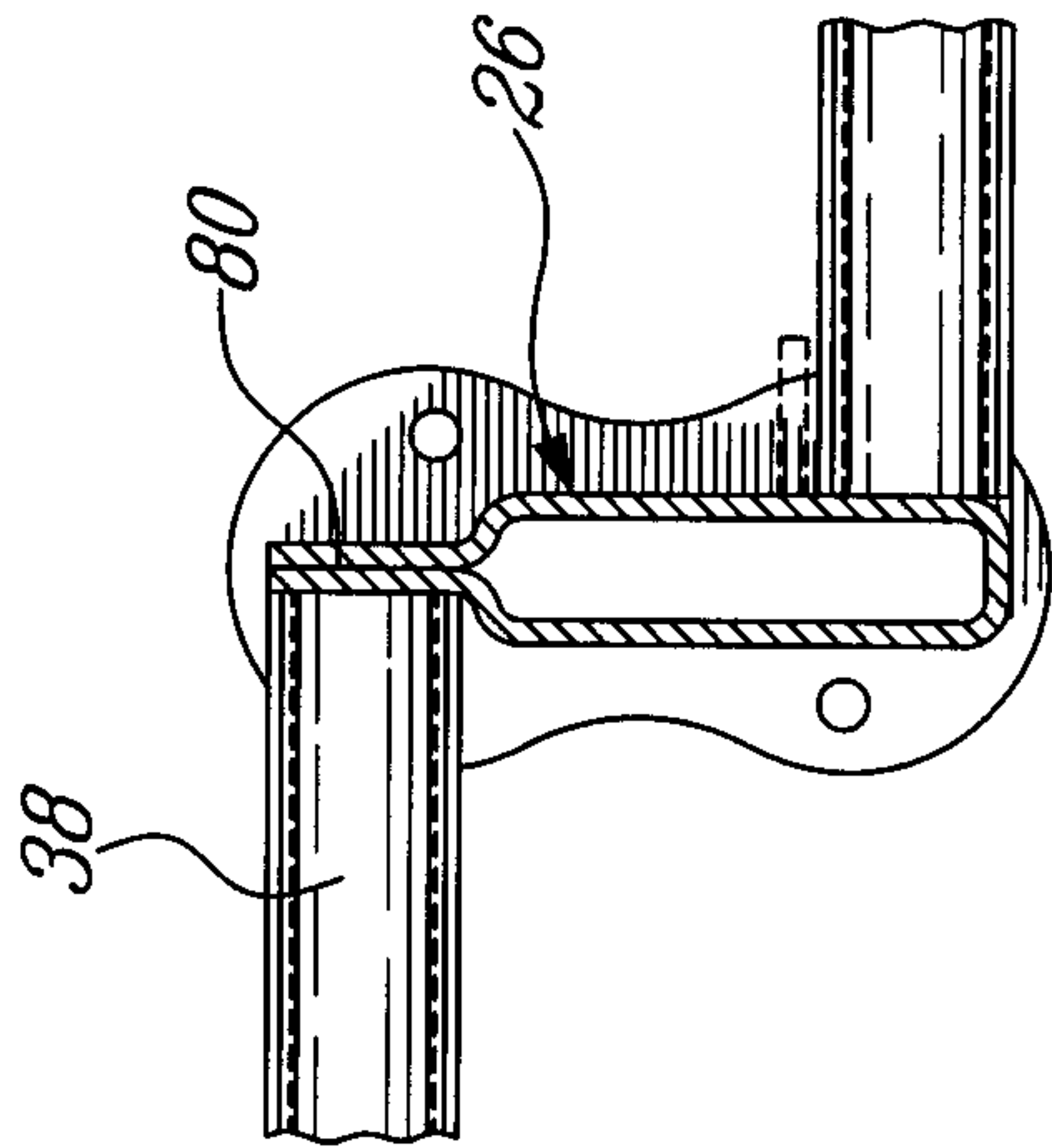


Fig. 7

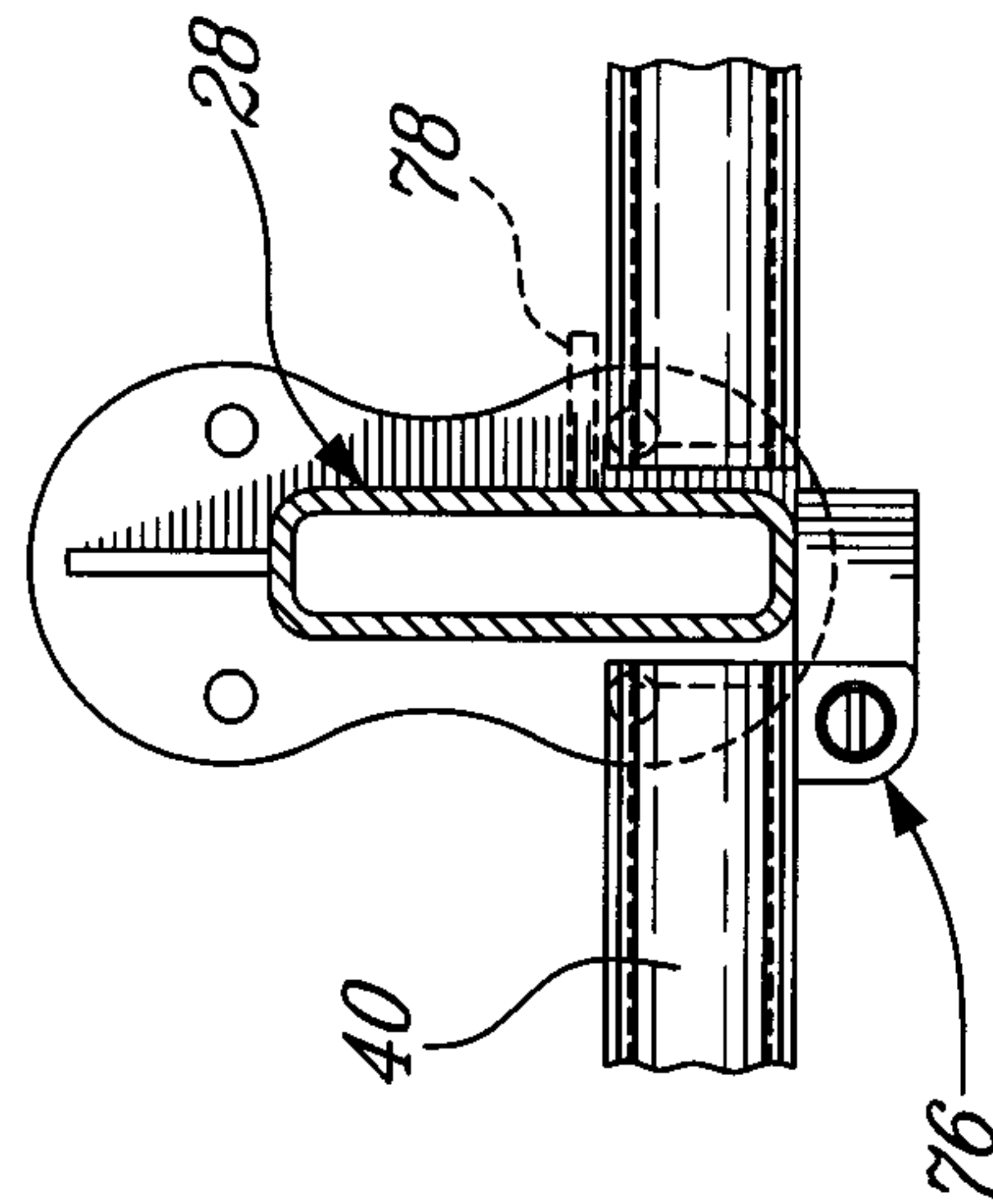


Fig. 8

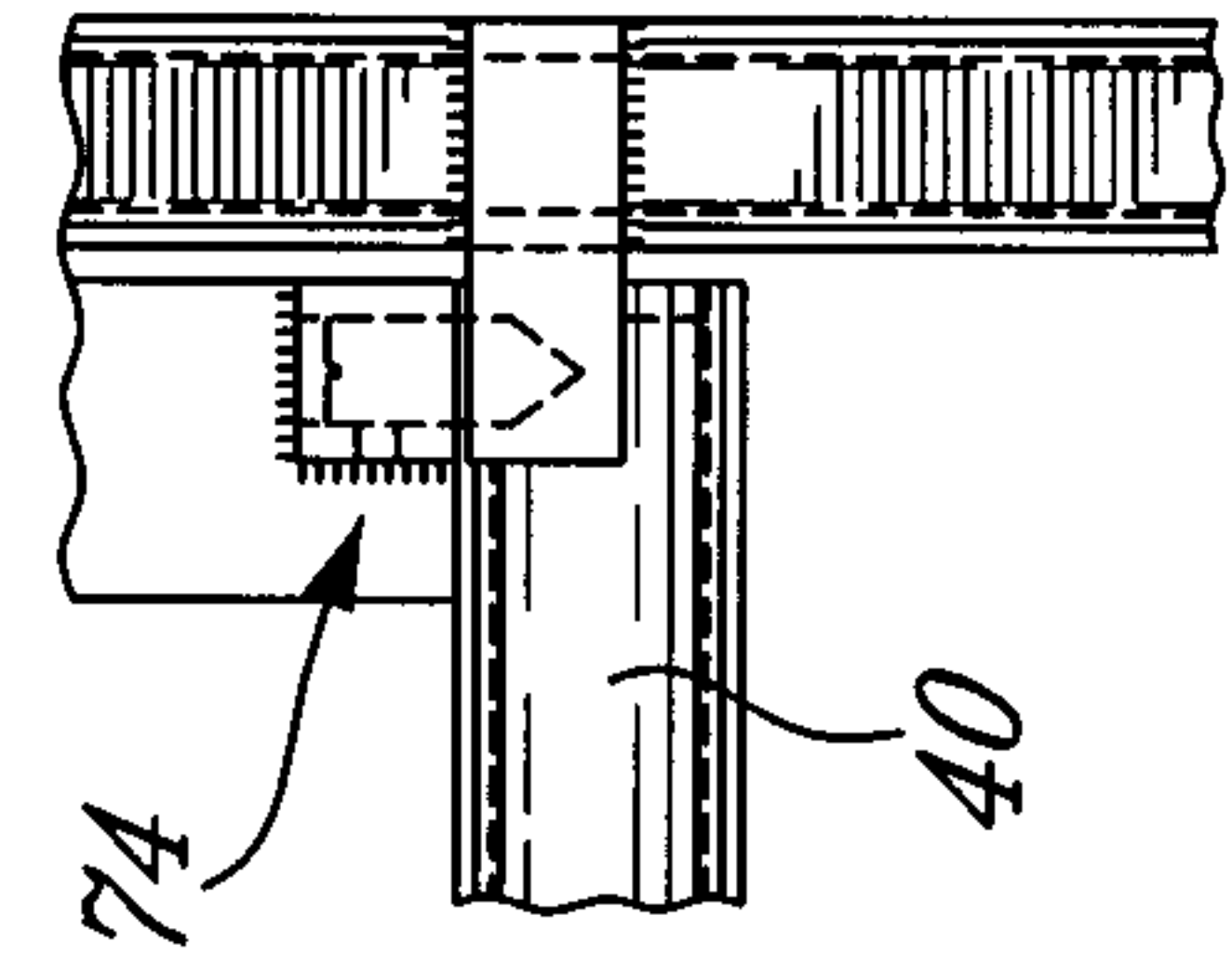


Fig. 9

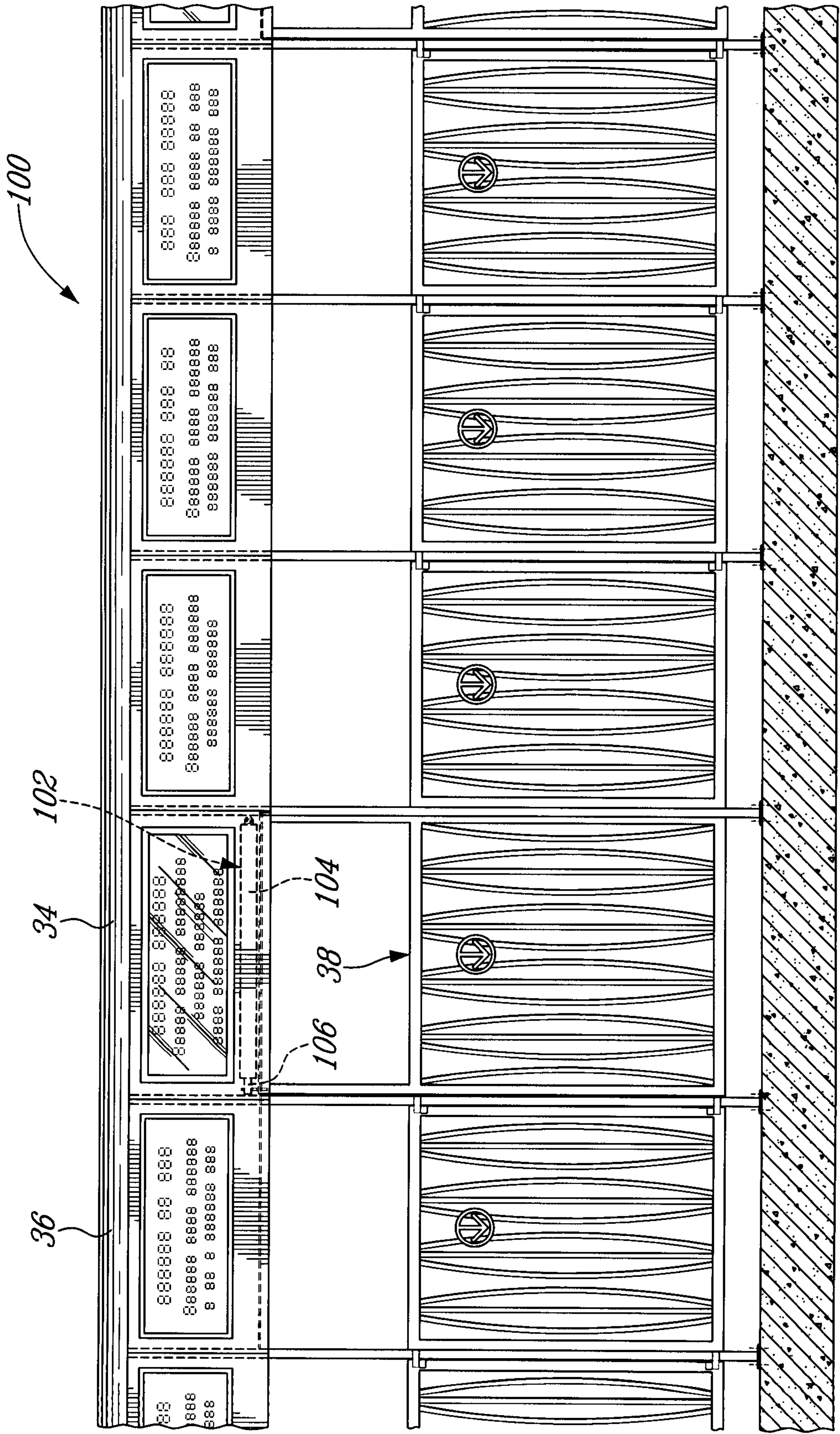


FIG. 10

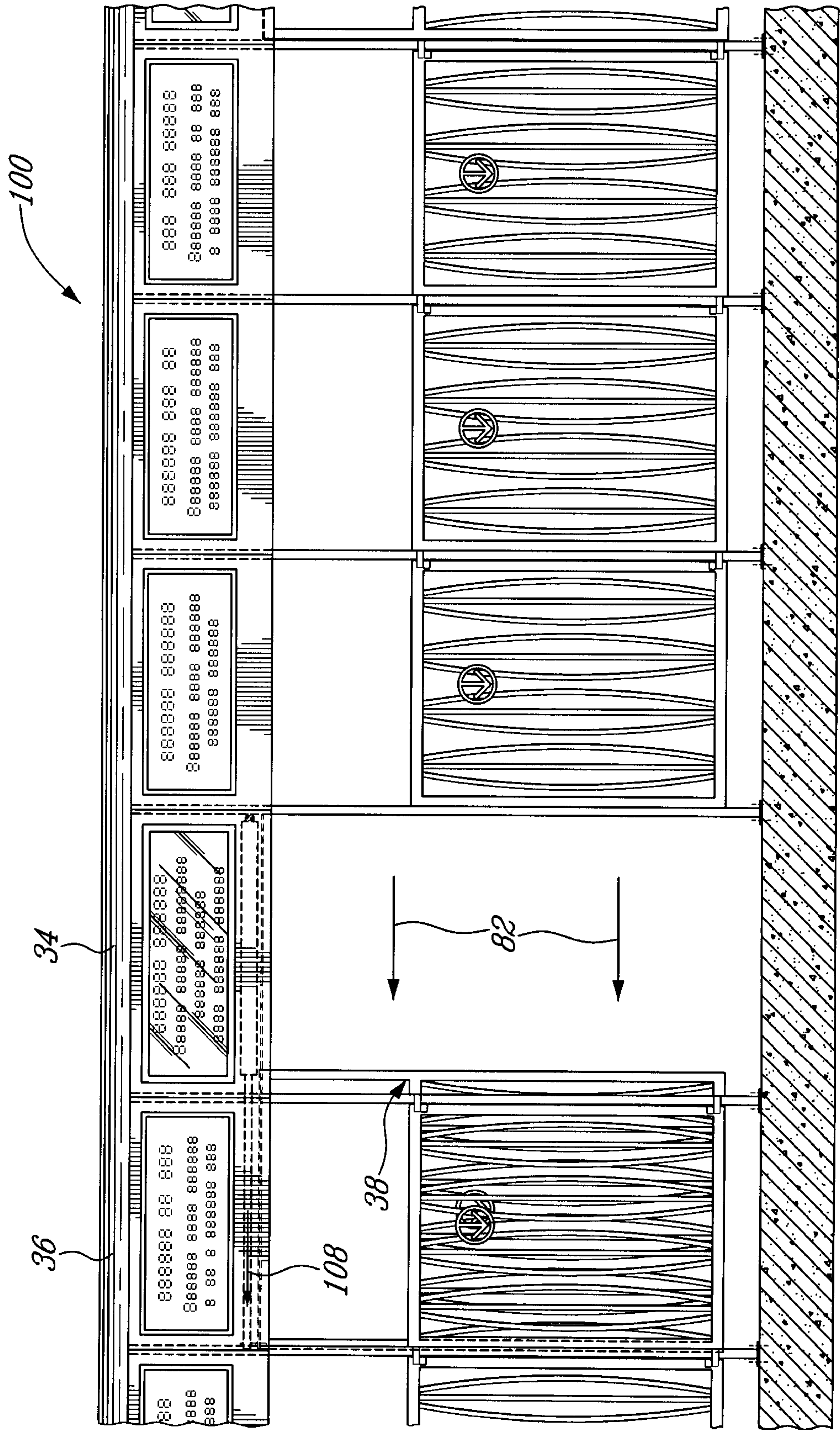
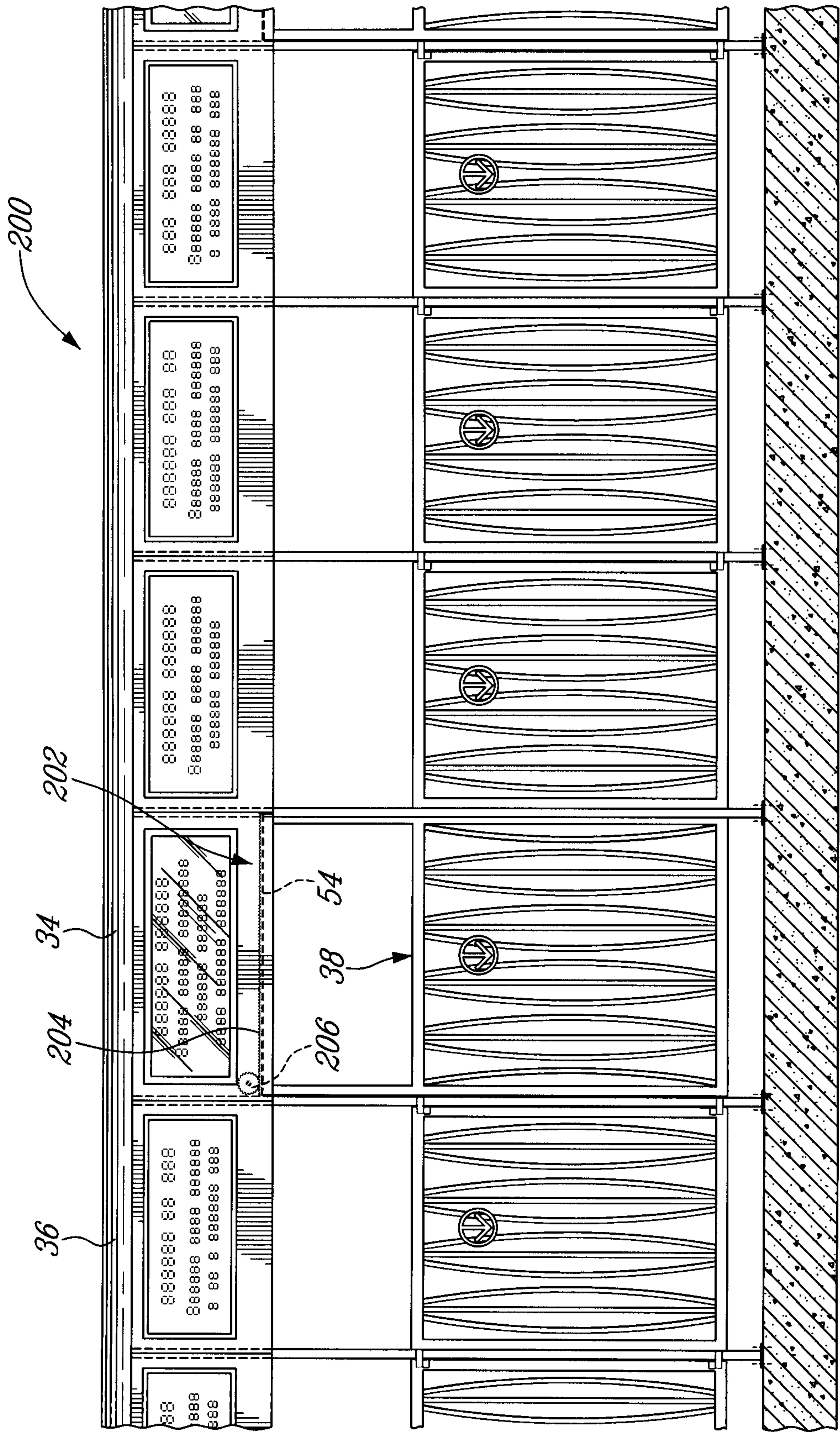


FIG. 11



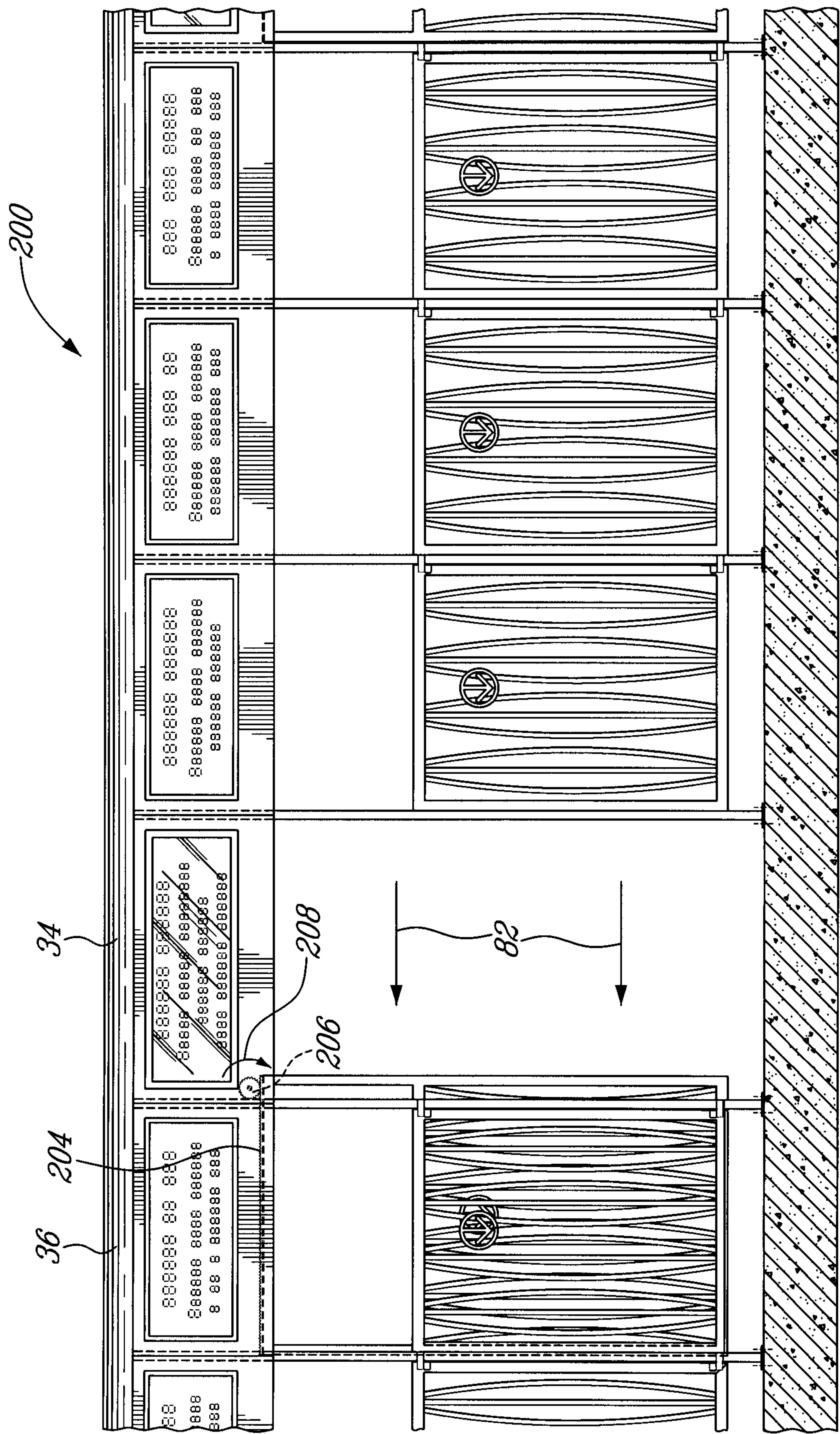


FIG. 13

