United States Patent [19]

Bradbury

[11] **3,828,688**

[45] **Aug. 13, 1974**

[54] **DYNAMIC STOP**

[75] Inventor: **Bernard G. Bradbury,** Chico, Calif.

[73] Assignee: **Rexnord Inc.,** Milwaukee, Wis.

[22] Filed: **Nov. 24, 1972**

[21] Appl. No.: **309,026**

[52] **U.S. Cl.** **104/252,** 104/256

[51] **Int. Cl.** **B61k 7/18**

[58] **Field of Search** ..... 104/252, 256, 249; 105/368 S

[56] **References Cited**

UNITED STATES PATENTS

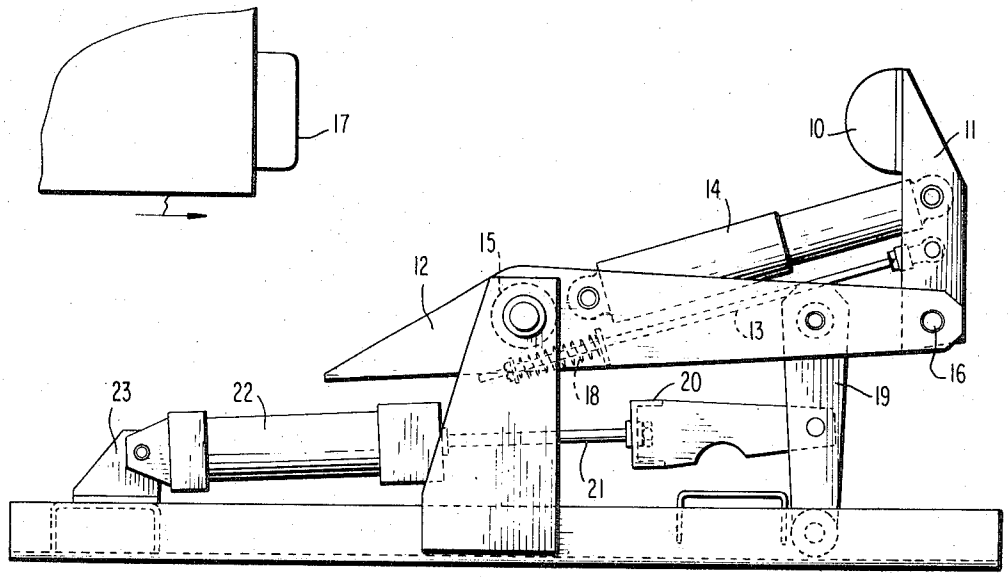
1,761,747	6/1930	Rosin et al.	104/256
2,017,392	10/1935	Blake	104/252
3,626,859	12/1971	Bradbury	104/252

Primary Examiner—Robert J. Spar
Assistant Examiner—Kenneth Noland
Attorney, Agent, or Firm—Sughrue, Rothwell, Mion, Zinn & Macpeak

[57] **ABSTRACT**

A dynamic stop for an operator-less railway transportation system consisting of an arm positioned between the tracks of the transportation system and pivotably mounted so that it does not interfere with the passage of the cars of the railway transportation system when not in use, but may be rotated up so that an absorbent stop plate mounted thereon will contact an absorbent bumper mounted on the front of the car which it is desired to stop. The dynamic stop may be mounted on a reciprocating device to further absorb the energy of contact.

6 Claims, 3 Drawing Figures



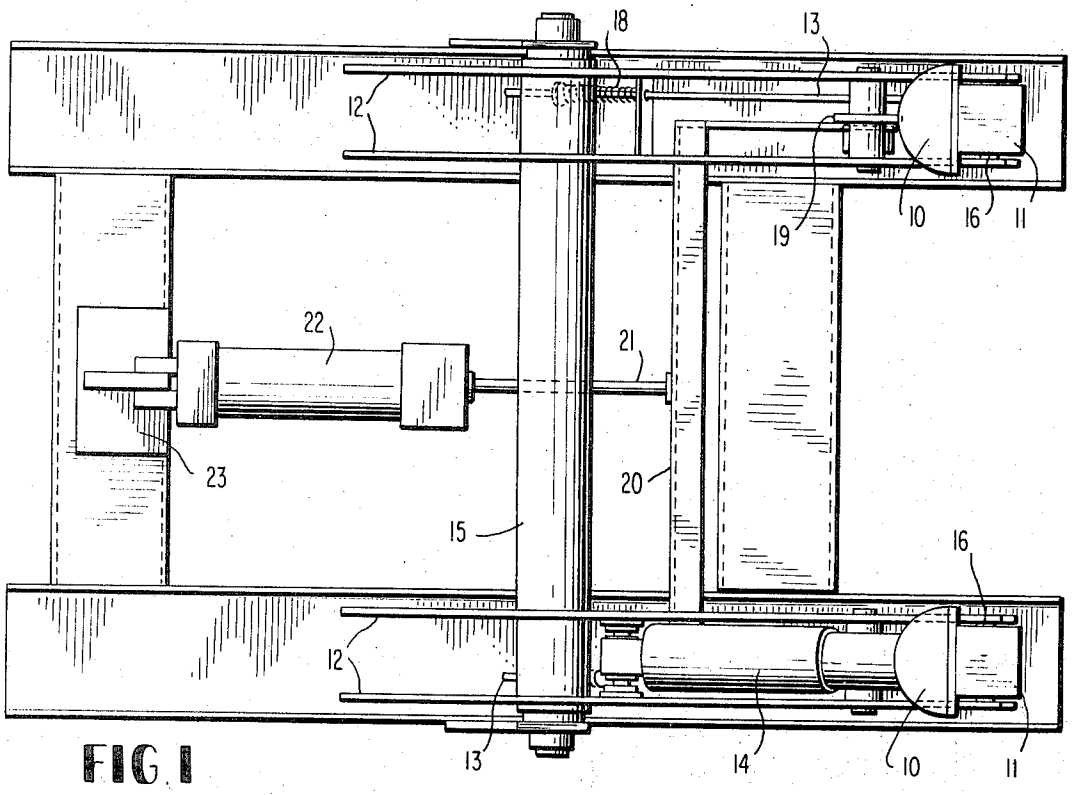

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FIG. 1

FIG. 2

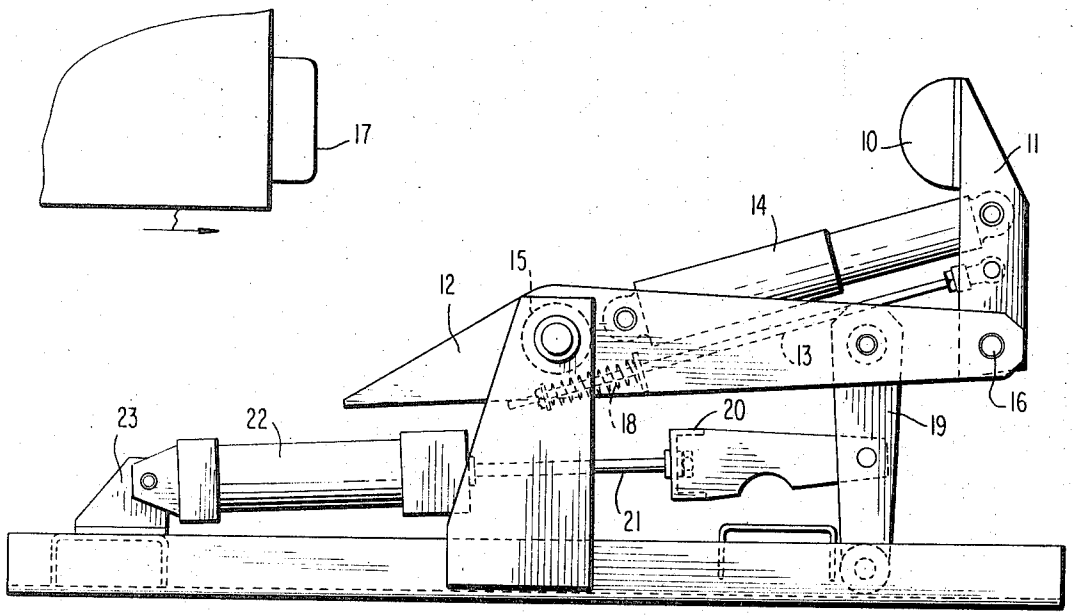
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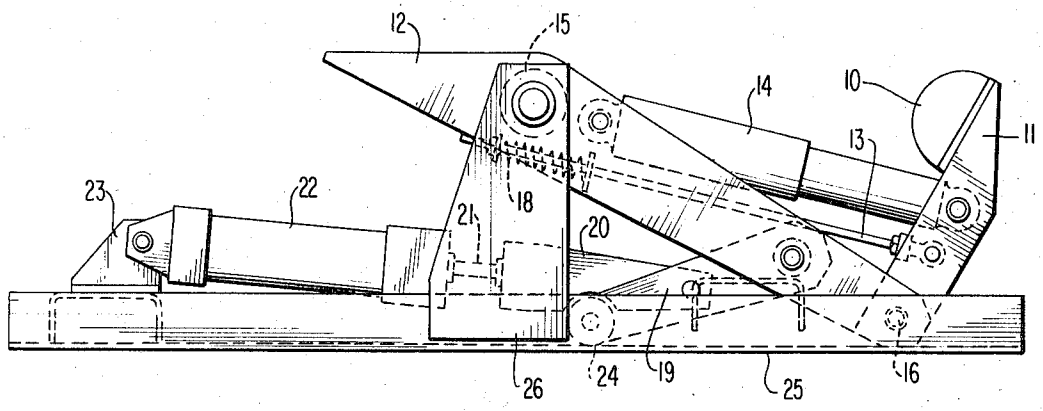
FIG. 3



DYNAMIC STOP

FIELD OF THE INVENTION

The invention relates generally to the selective stopping of cars in an operator-less, railway type transportation system and, more specifically, to the stopping of operator-less, remotely controlled cars in a transportation system such as is disclosed in commonly assigned U.S. Pat. Nos. 3,621,790, 3,626,859, and 3,650,216.

BACKGROUND OF THE INVENTION

To meet the demands of some transportation systems, it is necessary or desirable to use a large number of small carriers, or cars rather than a few large carriers, or trucks. This is particularly true when the freight to be carried by the transporation system must be sent to a large number of different destinations, but promptness is required, so that it is feasible to accumulate to any great extent different loads going to a common destination. Such systems, moreover, may be extremely heavily trafficked, as where they are used for baggage transportation in a major airport or mail transporation in a large post office. In such situations, it is necessary that mechanism be provided to permit rapid, selective stopping of the cars in the transporation system. This stopping may be required, for instance, before switching points, in idle car storage areas, and before car elevators and turn-tables. Such a mechanism is disclosed in general terms, but not claimed, in commonly assigned U.S. Pat. No. 3,626,859.

SUMMARY OF THE INVENTION

The cars of an operator-less, railway-type transportation system may be readily and selectively stopped by means of an arm positioned between the tracks of the transportation system and pivotably mounted so that it does not interfere with the passage of the cars when not in use, but may be rotated up so that an absorbent stop plate mounted thereon will contact an absorbent bumper mounted on the front of the cars. In a further refinement of thepresent invention, the stop may be mounted on a reciprocating device, the actuation of which on contact with the car further absorbs the energy of the contact.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view of a dynamic stop constructed in accordance with the present invention showing the dynamic stop in the raised position.

FIG. 2 is a side view of the dynamic stop shown in FIG. 1 in the raised position.

FIG. 3 is a side view of the dynamic stop shown in FIG. 1 in the lowered position.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

In the preferred embodiment of this invention, two absorbent stop plates **10** are mounted on stop arms **11.** The stop arms **11** are pivotably attached to pivot arms **12,** spring arms **13,** and shock absorbers **14,** each of which is in turn pivotably attached to the connecting pivot shaft **15.** The connecting pivot shaft **15** is pivotably mounted in lateral supports **26,** which are fixedly mounted to cam tracks **25,** the purpose of which will become apparent later on in this description. The cam tracks **25** are in turn fixedly connected to the trackway

or the tradeway support structure in a manner not shown. As may be seen most clearly in FIGS. **2** and **3,** this arrangement permits the stop plates **10** to be rotated clockwise about the pivot **16** by the impact of absorbent car bumper **17.** However, the rotation is resisted by the shock absorbers **14** and, to some extent, by the die springs **18** mounted on the spring arms **13,** thereby absorbing the energy of the contact. The die springs **18** serve also to return the stop arms **11** to an upright position and the shock absrobers **14** to their normal condition once the pressure of the car against the stop plates **10** is removed. It should be noted that this arrangement permits the stop arms **11** to function independently which is an advantage over the dynamic stop disclosed and claimed in copending application, Ser. No. 309,373, filed Nov. 24, 1972. This advantage particularly suits the dynamic stop disclosed herein for use on curved portions of the track. However, even on straight portions of the track it is important because the play allowed between the rails and the wheels can allow the car to cock slightly on the track.

The pivot arms **12** are also pivotably attached to cam arms **19,** which are in turn pivotably attached to linkage **20,** which connects the cam arms **19** and causes them to operate in unison. Linkage **20** is connected to the piston **21** of dual-action fluid cylinder **22,** which is pivotably mounted in the center of the trackway on cylinder bracket **23.** This mechanism permits the stop plate **10** and the upper portions of stop arms **11,** spring arms **13,** and shock absorbers **14** to be rotated down out of the way of approaching cars. Roller bearings **24** are mounted on the bottoms of the cam arms **19,** and these rollers bearings run along cam tracks **25** when the fluid cylinder **22** is actuated. The actuation of the fluid cylinder **22** may be controlled by any appropriate means — for example, the mechanism disclosed in commonly assigned U.S. Pat. No. 3,626,859.

It will be readily appreciated by those skilled in the art that various modifications in form and detail can be made in the above described embodiment without departing from the scope of the inventive concept. For example, the pivoting portion of the mechanism may be mounted on a reciprocating mechanism which would then reciprocate the two arms as a unit. For this reason the scope of the invention must be measured by the appended claims and not by the preferred embodiment disclosed herein.

What is claimed is:

1. A dynamic stop for selectively stopping the cars of a unit transporation system having a plurality of cars which travel along tracks, said dynamic stop comprising:

1. a pivot shaft adapted to be pivotably mounted adjacent to the tracks of a unit transportation system in a direction generally perpendicular to the direction of movement of the cars on the tracks;
2. a pivot arm mounted for pivoting around said pivot shaft;
3. a stop arm pivotably connected to said pivot arm about an axis parallel to said pivot shaft at a point thereon remote from said pivot shaft;
4. A shock absorber operatively connecting said stop arm to said pivot arm so as to resist pivoting movement of said stop arm with respect to said pivot arm in the direction of movement of the cars on the tracks;

5. A dual-action fluid cylinder having a piston which is pivotably connected to said pivot arm at a point thereon remote from said pivot shaft for causing said pivot arm to pivot about said pivot shaft to shift said stop arm between operative and inoperative positions, said fluid cylinder being adapted to be pivotably mounted adjacent to the tracks of a unit transportation system about an axis generally parallel to said pivot shaft.

2. A dynamic stop as claimed in claim **1** in which the piston of said dual-action fluid cylinder is connected to said pivot arm by means of a cam arm which acts as a linkage therebetween, said cam arm being pivotably connected to said pivot arm at a point thereon remote from said pivot shaft and the piston of said dual-action fluid cylinder being pivotably connected to said cam arm at a point thereon remote from said pivot arm.

3. A dynamic stop as claimed in claim **2** and further comprising:

1. A cam track adapted to be mounted adjacent to the tracks of a unit transportation system and
2. A roller bearing rotatably mounted on said cam arm in a position to cooperate with said cam track during actuation of said dual-action fluid cylinder.

4. A dynamic stop as claimed in claim **3** and comprising at least two sub-assemblies each one of which comprises a pivot arm, a stop arm, and a shock absorber connected together in the manner previously recited, whereby each sub-assembly acts separately, thereby compensating for slight variations in the direction of motion of the cars of the unit transportation system.

5. A dynamic stop as claimed in claim **1** and comprising at least two sub-assemblies each one of which comprises a pivot arm, a stop arm, and a shock absorber connected together in the manner previously recited, whereby each sub-assembly acts separately, thereby compensating for slight variations in the direction of motion of the cars in the unit transportation system.

6. A dynamic stop as claimed in claim **1** and further comprising means for biasing said stop arm with respect to said pivot arm in the direction opposite to the movement of the cars on the track, whereby said stop arm will have a tendency to return to an initial position after one of the cars has been stopped by it.

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UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,828,688 Dated August 13, 1974

Inventor(s) Bernard Bradbury

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In The Specification:

Column 1,	line 15	comma should be after cars
	line 17	"transporation" should read - transportation --
	line 19	after "is" (second occurrence) - not -- should be inserted
	line 23	"transporation" (second occurrence) should read -- transportation --
	line 26	"transporation" should read -- transportation --
	line 35	"readily" should read -- rapidly --
	line 42	no space between "the present"
Column 2,	line 1	"tradeway" should read -- trackway --
	line 14	after "independently", a comma should be inserted
	line 51	"transporation" should read -- transportation --
	line 63	"A" should read -- a --
Column 3,	line 1	"A" should read -- a --

Signed and sealed this 12th day of November 1974.

(SEAL)
Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

FORM PO-1050 (10-69)

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