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Manns

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[54] **ROLL-UP DOOR**

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[30] **Foreign Application Priority Data**

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[52] **U.S. Cl.** **160/273;** 160/23; 160/133; 160/285

[51] **Int. Cl.** **E06b 9/08**

[58] **Field of Search** 160/23–26, 160/133, 238, 266–273, 284–287

[56] **References Cited**

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[57] **ABSTRACT**

In a roll-up door having a flexible door-leaf arranged to be wound about a roller for closing and opening the door, means for maintaining said door-leaf in a stretched condition laterally, said means including trolleys running in guide rails provided in vertical side frames, and means for maintaining said door-leaf in a stretched condition vertically, said means including a movable pulley loaded by a weight, said weight being divided into two opposing load components by a wire running from the trolley around two stationary pulleys and over said loaded movable pulley to a winding drum supported on the shaft of said roll-up roller.

4 Claims, 3 Drawing Figures

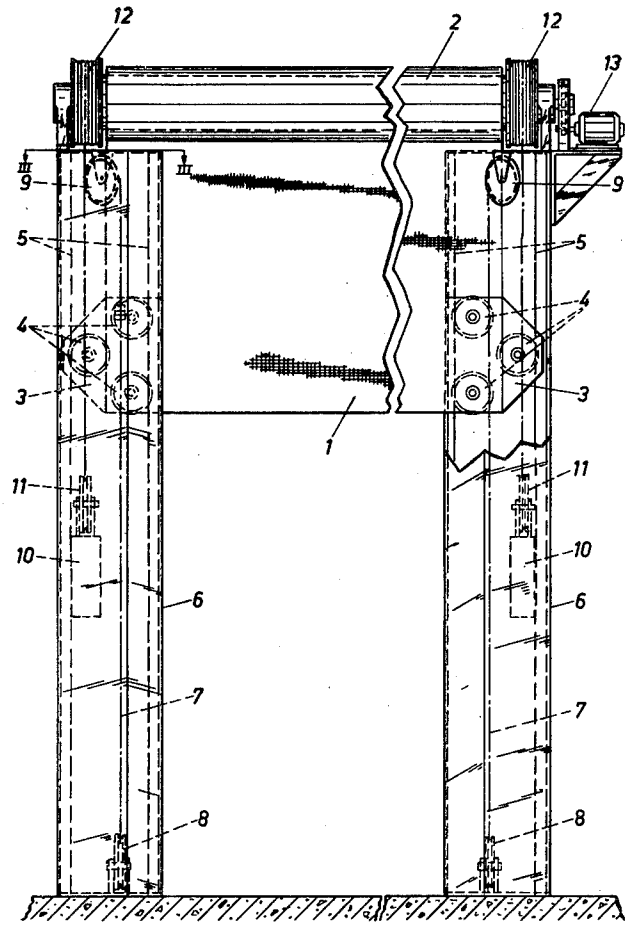


Fig. 1

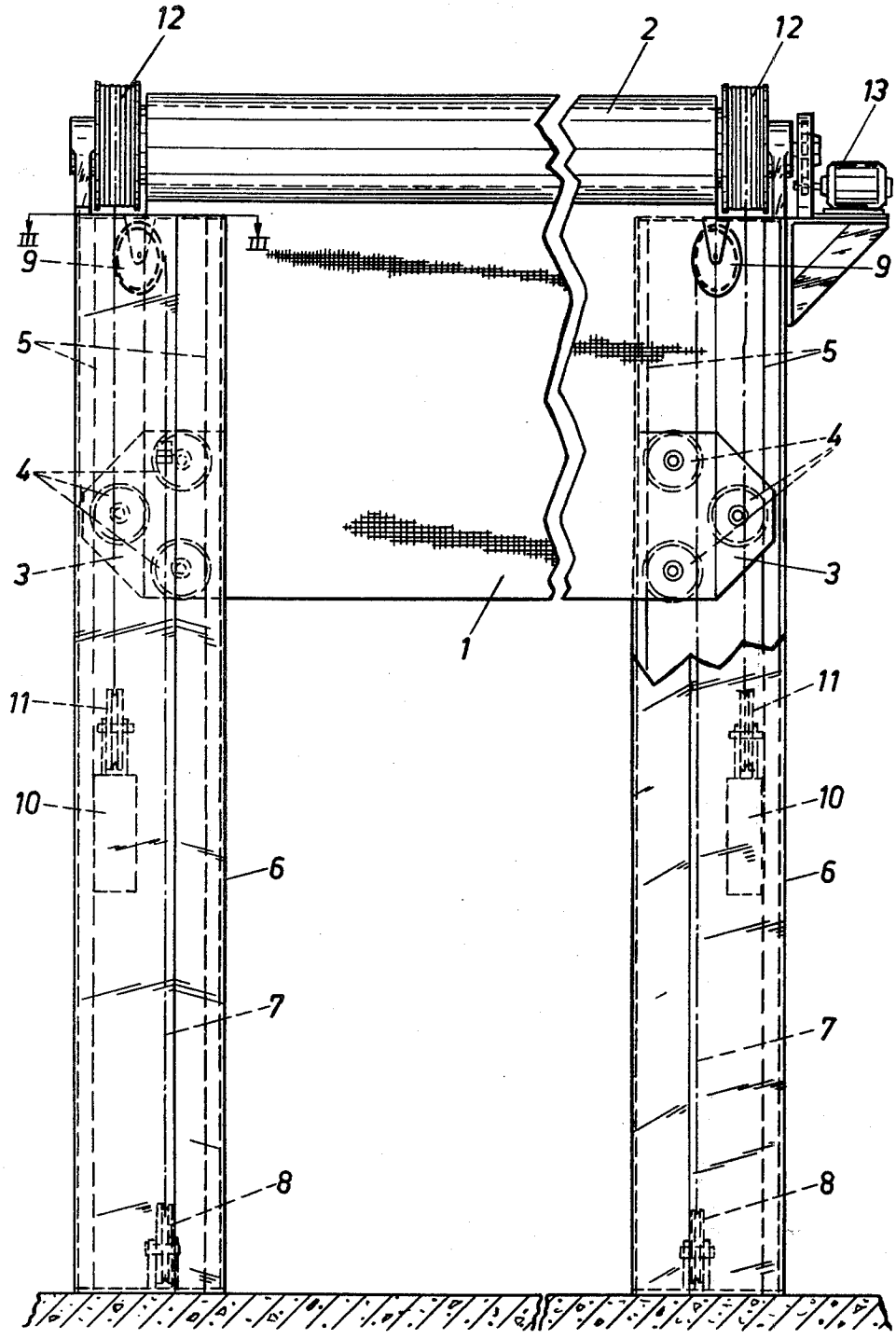


Fig. 2

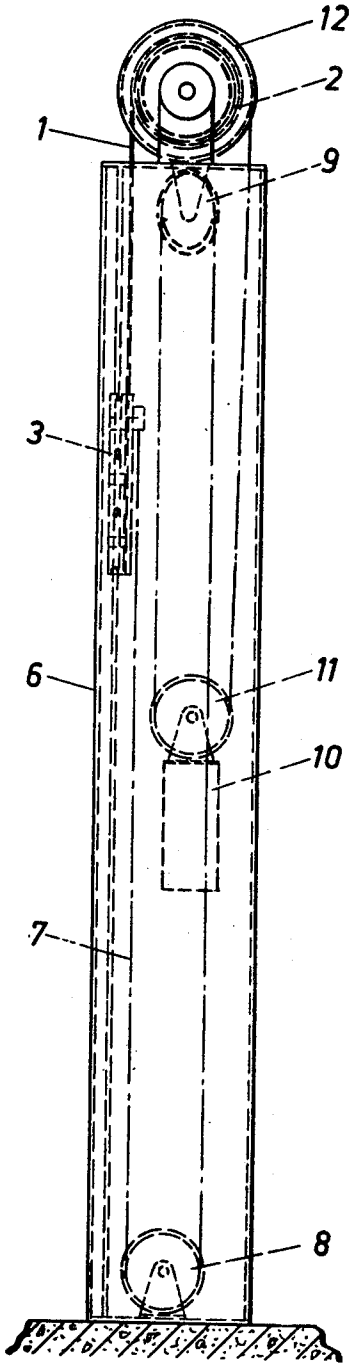
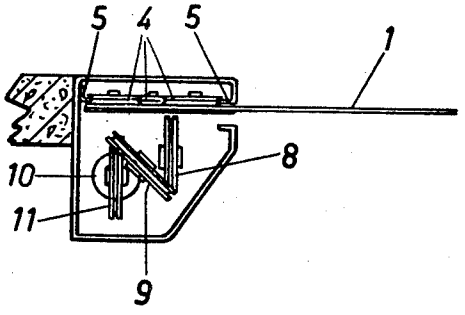


Fig. 3



ROLL-UP DOOR

BACKGROUND OF THE INVENTION

To avoid disturbances such as air currents, noise, etc. between two premises, e.g. factory halls, or between an indoor room and an outdoor room, it is necessary that the interconnecting opening is blocked off by a door or gate. The doors available on the market are manufactured in the shape of

a. continuous, rigid door-panels,

b. divided, rigid door-panels, the divisions being hingedly interconnected,

c. door-panels consisting of steel lamellae, and

d. doors made from aluminium profiles arranged to be telescopically nested in one another.

A feature common to all types of doors mentioned above is that in open condition they are collected above the door opening and several of them require considerable headroom space vertically or in plane above the opening. The speed of opening up the doors is for all the door types mentioned very low and in consequence thereof considerable hold-up time is required for internal transports, particularly in case double doors are used including an air lock where one door has to be shut before the second one opens.

SUMMARY OF THE INVENTION

The roll-up door in accordance with the present invention is of the type where the door-leaf is flexible and arranged to be wound about a roller into open position. It is characterised in that the door-leaf is maintained in a stretched condition laterally by means of trolleys having preferably grooved wheels running in contact with guide rails provided in vertical side frames. The opening and closing movements of the door in accordance with the invention may be performed rapidly, the door is noiseless and the space required to accommodate the door-leaf in open positions minimal. In accordance with one embodiment of the invention the weight of the door-leaf may be completely balanced, making it possible to easily operate the door manually, should this be required.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will be described more in detail in the following with reference to the accompanying drawings wherein,

FIG. 1 is a front view of a roll-up door in accordance with the invention, the door being in a semi-open position,

FIG. 2 is a side view of the door, and

FIG. 3 is a horizontal section along line III—III of FIG. 1.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

The door-leaf **1** consists of a flexible material, such as a fabric which may be coated with polyvinyl chloride, an epoxy resin or similar substance. The fabric must be of a kind that is dimensionally stable laterally. Above the door opening is rotatably mounted a roll-up roller **2** onto which the flexible door-leaf **1** may be wound. At each one of the two lower corners of the door-leaf **1** is provided a trolley **3** having grooved wheels **4** running in contact with guide rails **5** provided in the vertically positioned side frames **6** of the door.

These trolleys maintain the door-leaf **1** in a stretched condition in the lateral direction. To each trolley **3** is attached one end of a wire **7**. Each wire **7** runs around stationary pulleys **8** and **9** and over a movable pulley **11** loaded by a weight **10**. The opposite end of each wire **7** is attached to a winding drum **12** which is rigidly secured to the same shaft as in the roll-up roller **2** and onto which the respective one of the wires **7** is wound.

The wires **7** are wound off and on its respective winding drum **12** in the opposite direction to the unwinding and rolling-on of the door-leaf **1** onto and off the roll-up roller **2** which means that when the door-leaf **1** is wound off (the door closes), the wires **7** will be wound on, and the reverse for opening the door. On account of the heaviness of the weight **10**, the wires **7** will exert a downwards pulling effect on the trolleys **3** and in doing so will maintain the door-leaf in a stretched condition in the vertical direction. The weight of the trolleys **3** and that of the door-leaf **1** may be balanced through a suitable choice of diameter relations between the roller **2** and the winding drum **12**. This balancing may be carried out in such a manner that the door, when released, may be brought to a standstill in the position desired.

The door is driven in the conventional manner by means of a motor **13** which is coupled to the roll-up roller **2**. The operation may be effected electrically from a position which is convenient for instance for the truck drivers, and may be effected either manually or automatically with the aid of e.g. photoelectric cells. Owing to the balancing a rather small power is required for the motor **13** to effect the closing and opening movements.

What I claim is:

1. An improved roll-up door including a flexible door-leaf, a roller onto which said door is wound, first and second vertical side frames, guide means supported by said side frames for guiding said door during vertical movement, trolleys in said frames for maintaining said door in stretched condition laterally, the improvement comprising first and second pulleys, arranged in said vertical side frames respectively, first and second weights respectively secured to said pulleys for maintaining said flexible door in stretched condition in the vertical direction and simultaneously balancing said door, a groove in each of said pulleys, first and second ropes running in said respective grooves in each of said pulleys, first and second winding drums respectively at the ends of said roll-up roller, and first and second stationary pulleys in said frames, each of said ropes arranged to divide said respective weight into two opposing load components, one through the connection of one of the rope ends to said respective winding drum and the other one through the connection of the remaining rope end to said trolley via said first and second stationary pulleys, each of said ropes being respectively wound onto and off its respective winding drum in a direction opposite to the winding-on and winding-off directions of the door-leaf onto and off said roll-up roller.

2. An improved roll-up door as claimed in claim **1**, wherein said door-leaf is made from a fabric.

3. An improved roll up door as claimed in claim **2**, wherein said fabric is coated with polyvinyl chloride.

4. An improved roll-up door as claimed in claim **2**, wherein said fabric is coated with an epoxy resin.

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