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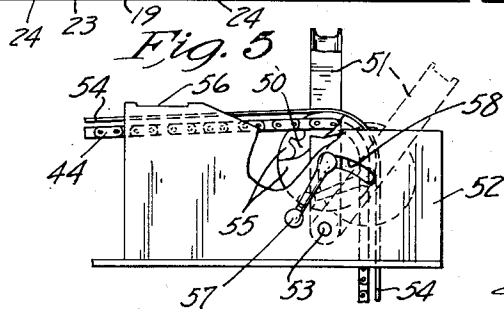
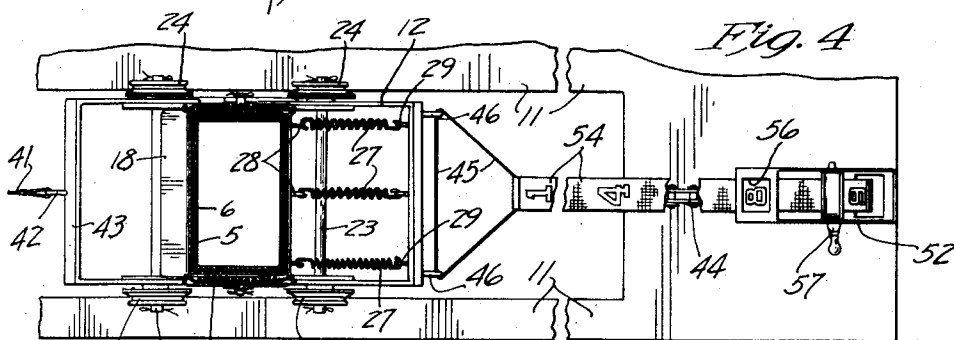
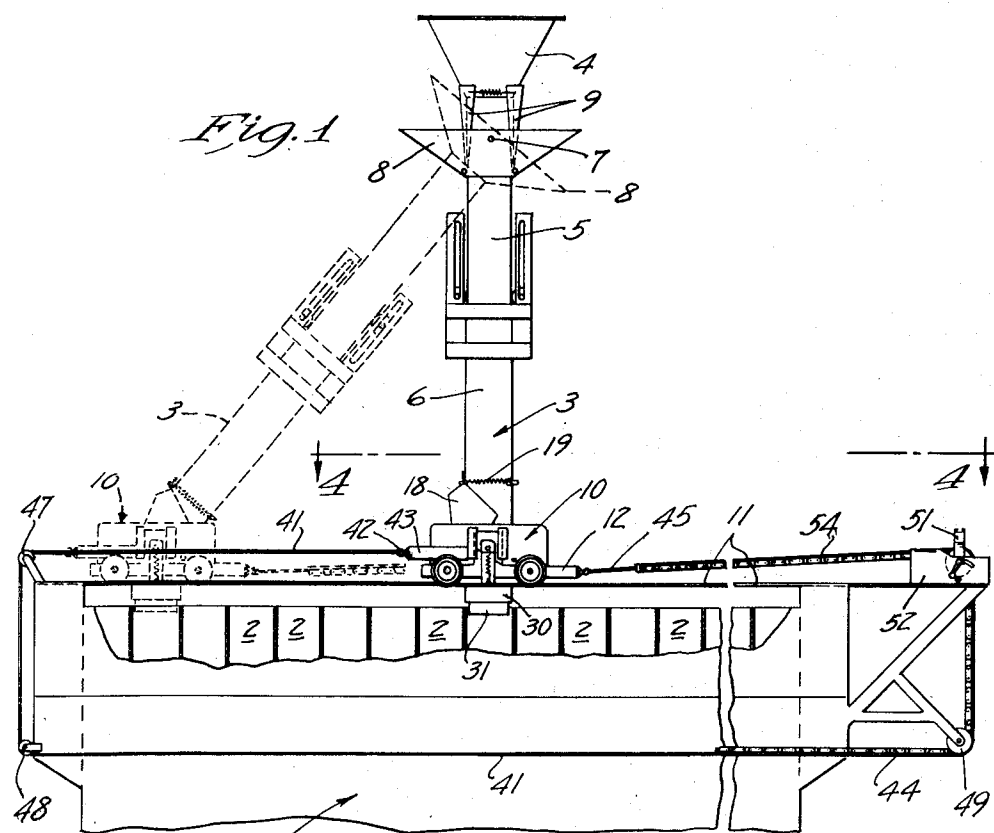
R. A. GERBER

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DISTRIBUTOR HEAD FOR GRAIN TUBES

Filed June 30, 1950

3 Sheets-Sheet 1



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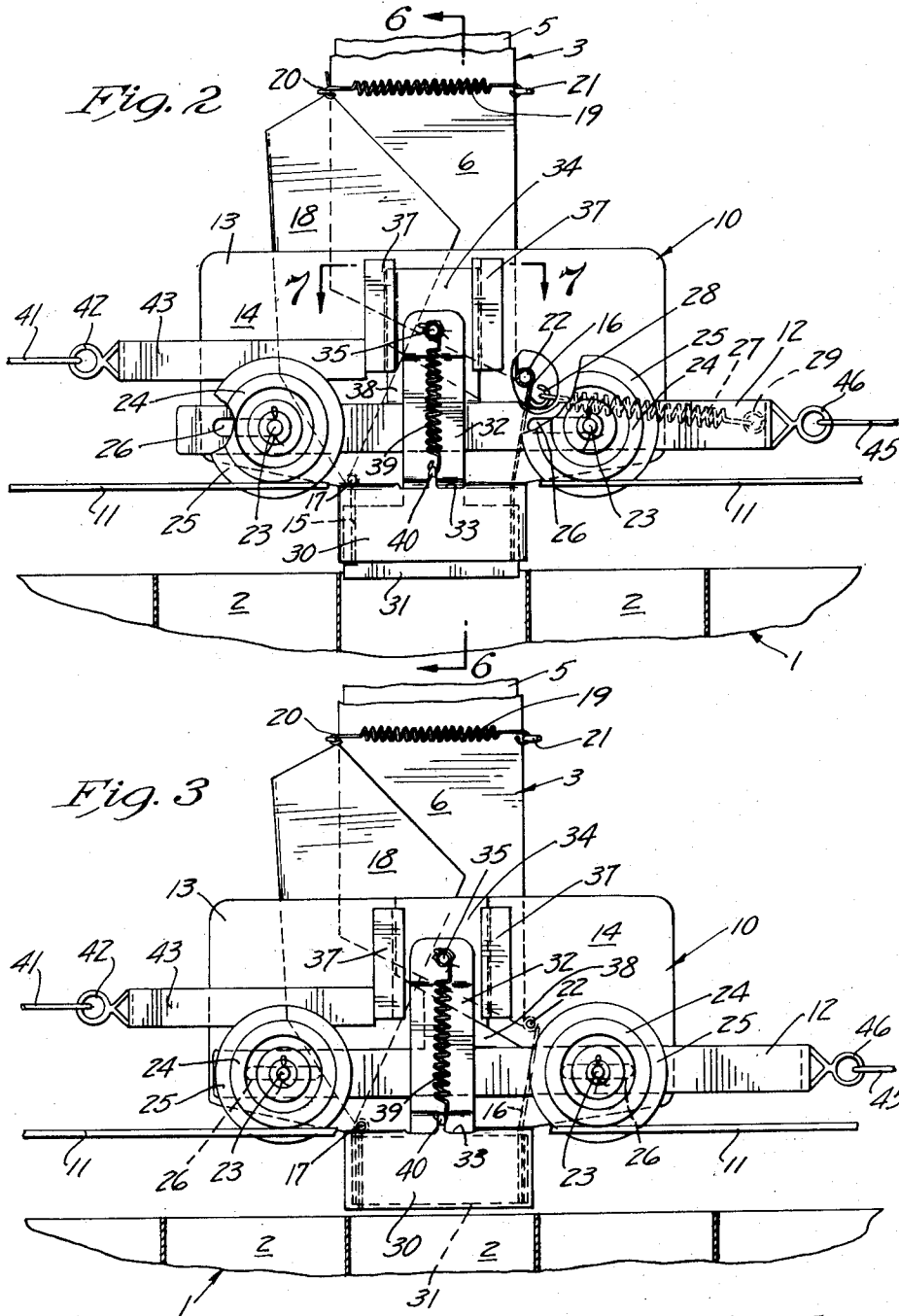
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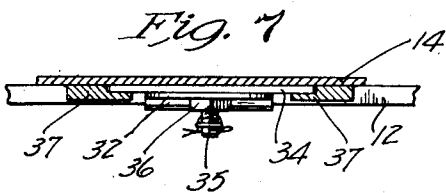
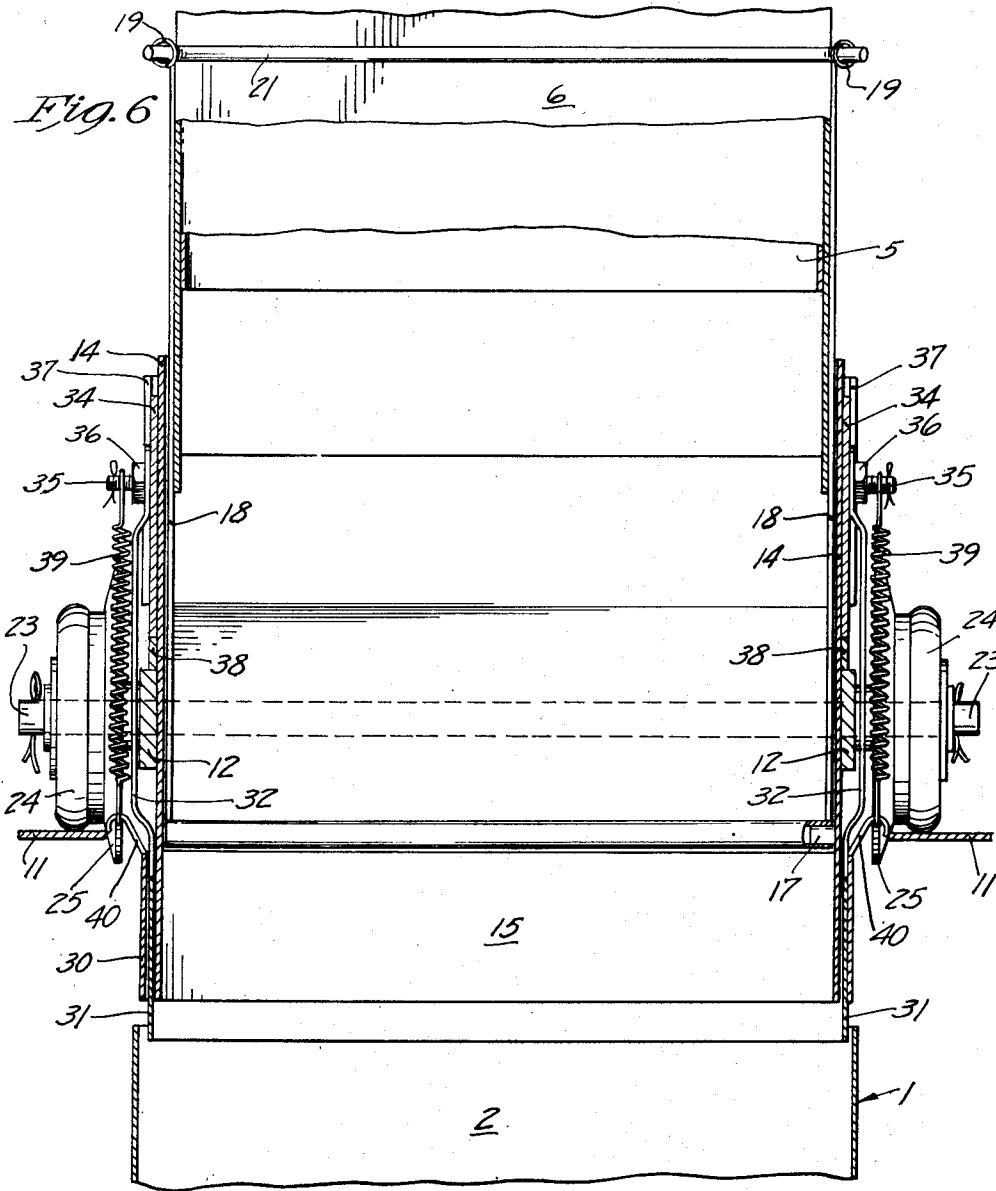
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UNITED STATES PATENT OFFICE

2,657,782

DISTRIBUTOR HEAD FOR GRAIN TUBES

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4 Claims. (Cl. 193—3)

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My invention relates to wheel mounted heads or trucks adapted to be interposed between the lower output ends of delivery chutes and the upper input ends of a plurality of vertically-disposed receiving ducts in side-by-side relation. Such devices are commonly used in grain elevators and warehouses, wherein both grains of varying kinds and grains of the same kind but of varying qualities are stored. In a given set-up of this type all incoming grains pass through the delivery chute to a selected one of said vertically disposed receiving ducts.

With all delivery heads heretofore developed, it has been extremely difficult to obtain such alignment between the delivery chute (working through said delivery head) and a selected one of said receiving ducts, as will prevent some spillage of the grain intended for said selected receiving duct into an adjacent delivery duct.

The primary object of my invention is the provision of a delivery head which will make it possible to obtain perfect registration between the delivery duct, acting through said delivery head, with any selected one of said ducts—and in this manner to avoid commingling of different stocks or of different grades of the same stock.

A further object of my invention is the provision of a device of the above type, which may be operated efficiently by remote control.

A still further object of my invention is the provision of a head of the above type by which it is possible to determine by remote control whether perfect registration has been obtained between said head and a selected one of said ducts.

A still further object of my invention is the provision of a device of the class described, which is relatively inexpensive to produce, rugged in construction, and durable in use.

The above and still further objects of my invention will become apparent from the following detailed specification, appended claims, and attached drawings.

Referring to the drawings, wherein like characters indicate like parts throughout the several views:

Fig. 1 is a fragmentary view in side elevation of a portion of the distribution floor of a grain elevator, illustrating the use of my invention;

Fig. 2 is a view corresponding to the coupler portion of Fig. 1, on a greatly enlarged scale, some parts being broken away and some parts shown in section;

Fig. 3 is a view corresponding to Fig. 2, but showing a different position of some of the parts;

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Fig. 4 is a fragmentary detail, partly in plan and partly in section, taken substantially on the line 4—4 of Fig. 1;

Fig. 5 is a fragmentary view in side elevation of a mechanism for moving the delivery chute and coupler to the various receiving duct openings;

Fig. 6 is a vertical section taken substantially on the line 6—6 of Fig. 2 on an enlarged scale; and

Fig. 7 is an enlarged fragmentary detail in section, taken on the line 7—7 of Fig. 2.

Referring with greater detail to the drawings, the numeral 1 indicates in its entirety the open upper end of a duct system arranged to convey grain to various bins, not shown, in a conventional elevator. As shown, the duct openings 2 are arranged in side-by-side relationship preferably a relatively short distance above, or even flush with the distribution floor of the elevator. Grain or other like material is fed selectively to the duct openings 2 by a conveyor chute 3 the upper end of which communicates with a hopper 4 that is adapted to receive material from an elevator boot or the like, not shown. The chute 3 is made up of telescoping sections 5 and 6 the former of which has its upper end pivotally connected to the lower end of the hopper 4 as indicated at 7. As indicated by dotted lines in Fig. 1, the chute is moveable about the axis of the pivot 7 whereby grain may be fed to various duct openings 2. A funnel-like upper end portion 8 on the chute section 5 and a pair of baffles 9 serve to prevent grain from spilling out at the connection between the hopper and the chute.

The lower end of the chute section 6 feeds through a wheel mounted head or truck 10 which overlies and is mounted for movements transversely of the duct openings 2 on a platform or track 11. The head 10 comprises a generally U-shaped frame 12 and an open ended coupler 13 which includes a pair of opposed side wall elements 14 and end wall elements 15 and 16. The end wall element 15 terminates at its upper end in a hinge 17 to which is pivotally mounted the lower end of a cross-sectionally U-shaped auxiliary chute 18 which extends above the head 10 and partially embraces the lower end portion of the chute section 6. The upper end of the auxiliary chute 18 is biased toward the chute section 6 by a coil tension spring 19 having its opposite ends secured, one to the auxiliary chute 18 as indicated at 20 and the other end to a hook 21 welded or otherwise rigidly secured to the chute section 6. The end wall element 16 of the

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coupler 13 extends upwardly a greater distance than the wall element 15 and terminates in a hinge connection 22 which pivotally anchors the lower chute section 6 to the coupler 13.

The side wall elements 14 extend laterally in opposite directions beyond the end wall elements 15 and 16 and have mounted therein horizontally disposed axles 23. The axles 23 are in spaced parallel relationship laterally outwardly of the adjacent end wall elements 15 and 16 and have journal mounted wheels 24 at opposite ends thereof. The mounting wheels 24 are provided with flanges 25 which engage the inner edge portions of the tracks 11 to prevent sideways motion of the head 10 with respect to the duct openings 2. With reference to Figs. 2 and 3, it will be seen that the axles 23 extend outwardly through horizontally disposed slots 26 in the U-shaped frame 12. Although not shown, the slots 26 occur in both sides of the frame 12. A plurality, as shown three, of coil tension springs 27 are one each connected at one of their ends to one of a plurality of anchoring hooks 28 on the end wall element 16 and at their other ends one each to one of a plurality of eyebolts 29 fast on the intermediate portion of the frame 12.

The coupler 13 terminates at its lower end closely above the duct openings 2 and is formed with a depending peripheral rectangular flange 30 which encompasses the lower central portions of the side elements 14 and the wall elements 15 and 16, each side of the flange 30 being in spaced parallel relationship to an adjacent wall element of the coupler 13. A rectangular skirt 31 is mounted for vertical movements between the flange 30 and the wall elements encompassed thereby into and out of a selected one of the duct openings 2. The opposite end walls of the skirt 31 are provided with upstanding arms 32 which project upwardly through openings 33 in the flange 30 and which are connected at their upper ends one each to one of a pair of cam members 34. As shown, the cam members 34 are provided with laterally outwardly projecting studs which project through suitable openings in the upper end portions of the arms 32, said arms being secured thereto by nuts or burrs 36. The cam members 34 are each mounted for vertical sliding movements in a pair of guideways 37 on the opposite wall elements 14 and at their lower ends have cam acting surfaces which engage cooperating cam acting surfaces on cam members 38, one each welded or otherwise rigidly secured to opposite sides of the frame 12. A pair of coil tension springs 39 have their upper ends one each looped over one of the studs 35 and lower ends one each secured to one of a pair of anchoring hooks 40 on opposite walls of the flange 30. The springs 39 supplement the force of gravity in biasing the skirt 31 toward its downwardly extended position whereby to maintain the cam members 34 in operative engagement with their cooperating cam members 38.

From the above, it should be obvious that movement of the frame 12 from the left to the right with respect to Fig. 2 and against bias of the springs 27 will cause the cam members 38 to raise the cam members 34 together with the skirt 31 against bias of the springs 39 to a position where the skirt 31 is drawn upwardly out of one of the duct openings 2, as indicated in Fig. 3. Of course movement of the frame 12 in the opposite direction will permit the skirt 31 to descend into a selected one of the duct openings

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2, the slots 26 in the frame 12 permitting relative movement between the frame 12 and the coupler 13.

Means for moving the head 10 out of registration with one duct opening 2 toward registration with another thereof, and for effecting relative movement between the coupler 13 and the frame 12 comprises a cable 41 connected at one end to an eyebolt 42 on a yoke 43 welded or otherwise secured to opposite side wall elements 14, and having its other end suitably fastened to one end of a link chain 44, the other end of which is secured to a cable 45 running through eyebolts 46 fast on the intermediate portion of the frame 12. The cable 41 runs over a pair of pulleys 47 and 48, and the chain 44 runs over a suitably journaled idler pulley 49 and a drive sprocket 50 which is journaled to the intermediate portion of an inverted U-shaped bracket 51 pivotally mounted to a supporting structure 52 as indicated at 53. A metallic tape or ribbon 54 is secured at its opposite ends to the opposite ends of the chain 44 and contains indicia stamped or otherwise printed thereon whereby the operator may be informed as to the location of the head 10 with respect to a given duct opening 2. The tape 54 runs over a pair of axially spaced pulleys 55 one on each side of the sprocket 50 and under a window opening 56 in the supporting structure 52. The sprocket 50 is adapted to be rotated by manipulation of a crank 57 which extends inwardly through an arcuate slot 58 in the one side wall of the supporting structure 52 whereby to move the head 10 from registration of the coupler 13 thereof with any one of the duct openings 2 to another selected duct opening.

As above indicated, the skirt 31 is biased toward entry into the several duct openings 2 and must be raised thereabove to permit movement of the head 10 from registration of one duct opening to another thereof. This is accomplished by swinging the U-shaped bracket 51 from its full line position in Fig. 1 to the dotted line position thereof. This swinging movement causes the frame 12 to move laterally with respect to the coupler 13 and the cam members 38 to raise the cam members 34 and the skirt 31 associated therewith. It should be noted that the head 10 can be moved from registration with one duct opening 2 to another duct opening only when the bracket 51 is in its dotted line position of Fig. 5. When the head 10 has reached an approximate position of registration with a selected duct opening 2, the bracket 51 may be released to its full line position of Fig. 5 thus causing the bottom edge of the skirt 31 to rest upon a partition between adjacent duct openings 2. Further movement of the crank 57 will place the coupler 13 into complete registration with the selected duct opening, whereupon the skirt 31 will descend therinto.

From the above it will be obvious that I have provided a mechanism capable of accomplishing the objectives set forth; and while I have shown and described a commercial embodiment of my novel device, it will be understood that the same is capable of modification without departure from the spirit and scope of the invention as defined in the claims.

What I claim is:

1. In a device of the class described, an angular frame including a pair of spaced parallel side frame members, a vertically-disposed open-ended tubular coupler disposed between said side frame

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members, a pair of axles extending through said frame and said coupler in spaced relation longitudinally of said side frame members, supporting wheels on opposite ends of said axles laterally outwardly of said frame and coupler, said frame members being provided with horizontally-extended slots for permitting limited sliding movements of said axles and said coupler with respect thereto, means yielding biasing said coupler toward one limit of its movement with respect to said frame, a skirt secured to the lower end of said coupler for telescopic extending and retracting movements, a pair of cooperating cam members one thereof being mounted on said frame for common movement therewith in a horizontal plane and the other thereof being slidably mounted on said coupler for movements in a vertical plane, means for coupling said last-mentioned cam member to said skirt, and yielding means for biasing said skirt toward its extended position, movement of said frame with respect to said coupler in a direction against the bias of said first-mentioned yielding means causing retracting movements to be imparted to said skirt against the bias of said last-mentioned yielding means.

2. In a device of the class described, a pair of elongated tracks straddling a plurality of vertically disposed duct openings immediately therebelow, a head slidably mounted for longitudinal movements on said track, said head including a frame, a vertically disposed open-ended tubular coupler mounted in the intermediate portion of said frame for limited sliding movements with respect thereto, means yieldingly biasing said coupler toward one end of said frame, supporting wheels disposed laterally outwardly of said coupler and mounted upon said tracks, a skirt secured to the lower end of said coupler for telescopic lowering and raising movements into and out of selected ones of said duct openings, yielding means biasing said skirt in a lowering direction toward said duct openings, cam means associated with said frame and said skirt operative to raise said skirt against bias of said last mentioned yielding means, cable means having one end attached to said frame and other to said coupler and adapted

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to impart longitudinal movements to said head upon said track in opposite directions whereby to selectively register said skirt with a given one of said duct openings, and means associated with the said cable for moving said frame with respect to said coupler.

3. The structure defined in claim 2 in which said last mentioned means comprises a drive pulley engaging and supporting a portion of said cable and a movable supporting element journalling said pulley, movement of said movable supporting element in one direction relative to said head effectively shortening said cable and causing the frame to be moved with respect to said coupler whereby to raise said skirt.

4. In a device of the class described, a pair of elongated tracks straddling a plurality of vertically disposed duct openings immediately therebelow, a wheeled head mounted for longitudinal movements on said track, said head including a tubular skirt and a movable actuator for imparting raising movements to said skirt, said skirt being biased toward a lowering position to cause registration thereof with a selected one of said duct openings, a looped cable having one end secured to said actuator at one end of said head and having its opposite end secured to said head in opposed relationship to said first mentioned cable end, means for applying tension to the ends of said cable to cause movements of said actuator in one direction with respect to said head whereby to raise said skirt out of registration with a given duct opening, and means associated with said cable for imparting movements to said head on said track in opposite directions.

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