

April 21, 1959

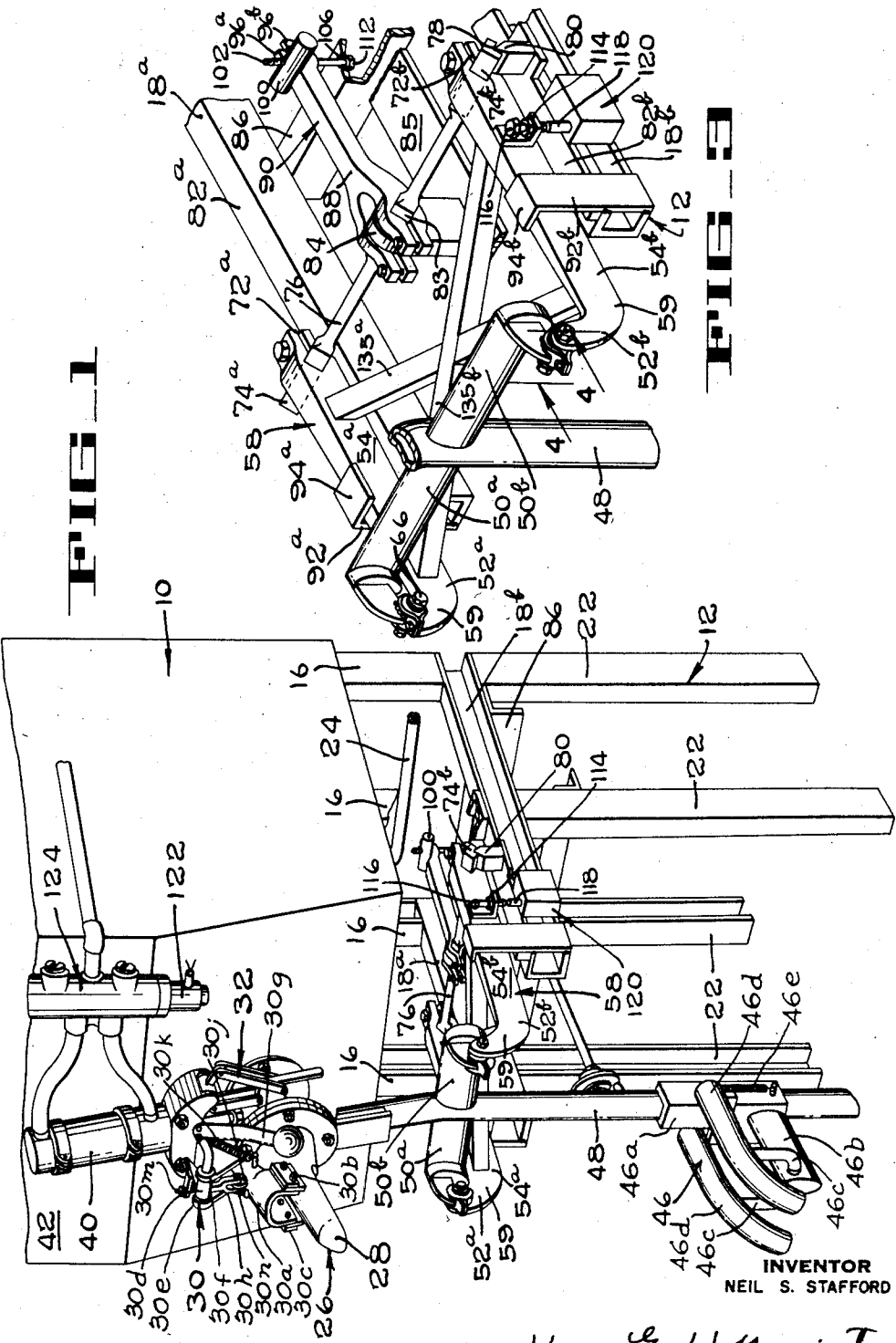
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2,883,140

SCALE ESPECIALLY FOR BAG FILLING MACHINES

Filed Sept. 17, 1954

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

FIG. 1

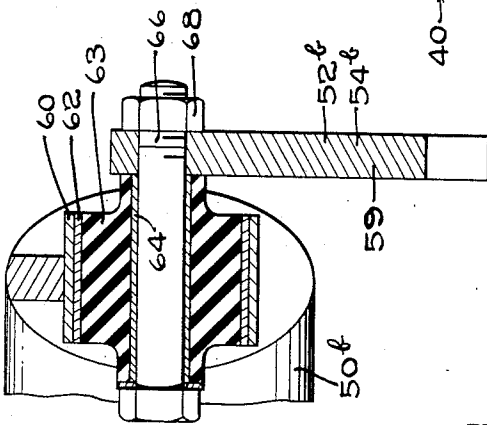
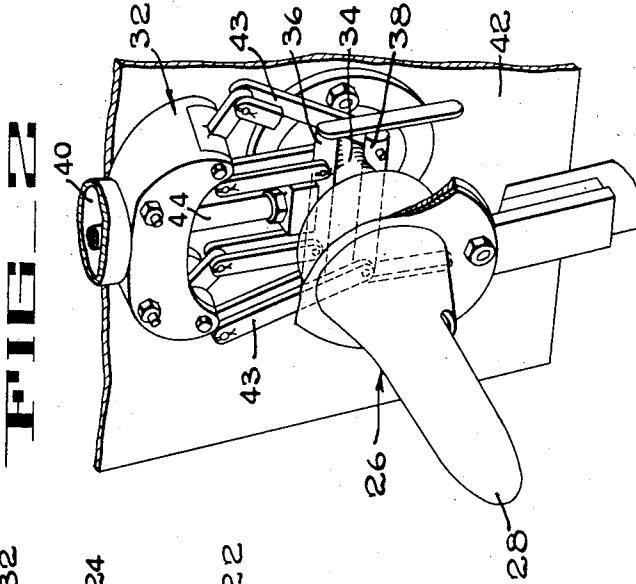
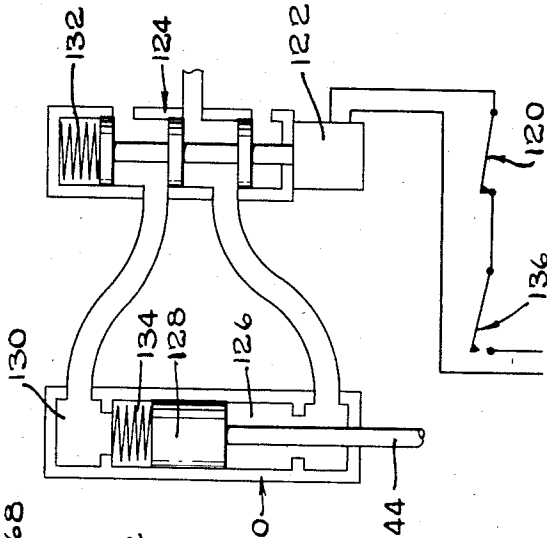


FIG. 2



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SCALE ESPECIALLY FOR BAG FILLING MACHINES

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Application September 17, 1954, Serial No. 456,655

14 Claims. (Cl. 249—63)

The present invention relates to scales, and more particularly to scales of the type employed in machines for filling powdered or granular materials into bags to limit the quantity of material filled into the bags to a desired weight.

Bag filling machines, of the type referred to, comprise usually a tank into which the material to be packed is delivered, a discharge spout at the lower end thereof through which flow of the material is guided into a bag, means effecting discharge of the powdered or granular material through the spout, and a bag supporting structure that is adapted to hold the bag with its material-receiving snout engaged over the discharge spout. This bag supporting structure forms usually part of a scale that operates upon accumulation of the predetermined weight of material in the bag to actuate mechanism which blocks further flow of the material through the spout.

It is an object of the present invention to provide a scale, for apparatus of the type referred to, that is of compact and simple construction and which is yet sensitive and dependable in operation.

Another object is to provide a scale, for bag filling apparatus, that may readily be adjusted to respond to different weights.

These and other objects of the present invention will be apparent from the following description of the accompanying drawings which illustrate a preferred embodiment thereof and wherein:

Fig. 1 is a fragmentary perspective of a scale constructed in accordance with the invention, as applied to a bag filling machine.

Fig. 2 is an enlarged perspective of the discharge spout of the bag filling machine shown in Fig. 1.

Fig. 3 is an enlarged fragmentary perspective of the scale shown in Fig. 1.

Fig. 4 is a section taken along line 4—4 of Fig. 3 illustrating a detail of the scale.

Fig. 5 is a diagram illustrating the manner in which the electric control circuit of the bag filling machine is governed by the scale embodying the invention.

Referring first to Fig. 1, the reference numeral 10 marks the bottom portion of a tank that rests upon a pedestal 12. Said pedestal is composed of four short legs 16 that stand upon two horizontally disposed parallel girders 18a and 18b which in turn are supported upon four elongated legs 22. Into the tank 10 the powdered or granular material to be bagged is delivered at the upper end thereof, and during operation of the machine the material within the tank is held in a condition simulating a fluid by rising currents of air introduced into the tank at the lower end thereof through a conduit 24 from a suitable source of low pressure air (not shown). From the lower end of the tank the fluidized material may escape through an inclined spout structure 26. Over the terminal portion 28 of said spout structure the material-receiving snout of a bag may be engaged and may be securely held in material-receiving position by a manually operable clamping mechanism 30.

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The clamping mechanism 30 comprises a clamp 30a, which has the form of a shell segment. Secured to the converging sides of the shell segment are rubber pads 30b and 30c, which project downwardly below the linear edges of the clamp segment and engage a bag held over the spout 26. For controlling the position of the rubber pads 30b and 30c, a horizontal spindle 30d is supported for rotary movement by members 30e and 30f. In order to manually operate the clamp mechanism 30, a downwardly extending handle 30g is secured to the spindle 30d. Also secured to the spindle 30d is a depending arm 30h which carries at its free end a roller 30j. The roller 30j engages the back of the clamp 30a. When the handle 30g is in the normal position, springs 30k and 30n urge the clamp 30a upward, whereby it is withdrawn from the spout 26 so that the bag may readily be slipped over the spout 26. When the handle 30g is raised or operated, the roller 30j depresses the clamp 30a and forces the rubber pads 30b and 30c into engagement with the bag that has been slipped over the spout 26, thus holding the bag securely in the material-filling position. When the clamp 30a is in the bag-retaining position, contact stud 30m, carried by the spindle 30d, is depressed for energizing an electrical control circuit.

The spout structure is provided with a control mechanism 32 that normally holds it in closed condition to prevent flow of material therethrough and which may be operated to open the spout whenever a bag has been engaged over its terminal portion 28. To this end the spout structure may comprise a resilient hose portion 34, and disposed above and below said resilient hose portion are transverse rods 36 and 38, respectively, (Fig. 2). A pneumatic cylinder 40 supported from the front wall 42 of tank 10 is arranged to hold these rods by means of suitable lever trains 43 so close together when its piston rod 44 is projected, that said rods deform and close the resilient hose portion 34 of the spout structure and thus block the flow of fluidized material therethrough. On the other hand retraction of the piston rod 44 causes the rods 36 and 38 to withdraw from the resilient hose portion, allowing it to expand so that flow of fluidized material from the tank to the terminal portion 28 of the spout structure and into a bag engaged thereover may take place.

During the filling operation the bag rests upon a saddle 46 (Fig. 1). The saddle 46 comprises a rectangular sleeve 46a disposed around the post 48 and secured thereto as by setscrews (not shown). Rigidly carried by the sleeve 46a is a forwardly projecting stud 46b, which pivotally supports a pair of legs 46c. The pivotal legs 46c are directed upwardly and have horizontal bag-supporting arms 46d pivotally secured thereto. One end of each bag-supporting arm 46d is curved downwardly remote from the post 48, while the other end thereof has a spring 46e secured to the lower surface thereof. The springs 46e, tensioned between the ends of the support arms 46d and the sleeve 46a, urge the support arms 46d into the position shown in Fig. 1. Accordingly, when the bag accumulates material, it rests on the horizontal portion of the support arms 46d. When the bag is full and the clamp 30a is raised, the support arms 46d pivot about the legs 46c to discharge the bag off the saddle and, after the bag is free from the support arms 46d, the springs 46e return the support arms 46d to their normal position. Said post has rigidly secured thereto two laterally extending horizontal arms 50a and 50b, the ends of which are turned forwardly and are supported for limited pivotal movement about a horizontally disposed transverse axis from the upturned ends 52a and 52b of a pair of horizontally extending parallel arms 54a and 54b that constitute part of a scale 58, which is constructed in accordance with the present invention. For this pur-

pose the ends of arms 54a and 54b are each provided with a forwardly extending member 59 that carries a clamp 60 which is clamped upon a bushing 62 of rigid material, such as steel (Fig. 4). Within said bushing is disposed a collar 63 of a resilient material, such as rubber that is suitably bonded to the inner cylindrical surface of the bushing 62. Extending through the central aperture of said collar 63 and suitably bonded to the inner cylindrical surface thereof is another bushing 64 of rigid material. Said bushing 64 is bolted to the upwardly turned tip of the adjacent scale arm 54a or 54b, as the case may be, by a threaded bolt 66 which is engaged by a nut 68. The clamp 60 retains in position the bushings 62 and 64 and the resilient collar 63 so that the bag supporting structure is capable of limited pivotal movement about the transverse axis defined by the bolt 66 through the resilient collar 63, and transmits a downward force on the arms 54a and 54b. By utilizing the pivotal clamp structure, the pivotal arrangement retains consistency and accuracy in operation.

The rear ends of arms 54a and 54b are split as shown at 72a and 72b (Fig. 3) and embrace and are firmly clamped down upon the radially enlarged ends 74a and 74b of a transverse rod 76 of spring steel. The laterally projecting extremities of the radially enlarged ends of said transverse rod 76 are provided with downwardly directed recesses 78 extending from the axis of the rod 76 that are engaged by knife edges 80 which are mounted in, and project upwardly from, the upper horizontal flanges 82a and 82b of the hereinbefore mentioned parallel girders 18a and 18b of pedestal 12.

At its center point the transverse rod 76 is supported in a ball bearing 84 that rests upon a shelf 85 which projects forwardly from a crossbar 86 that is rigidly secured to the bottom flanges 87a and 87b of the girders 18a and 18b respectively. Firmly clamped upon radially enlarged portions 83 of the transverse rod 76 at either side of ball bearing 84 is the bifurcated end 88 of a rearwardly extending lever 90. To subject the rod 76 to a predetermined degree of torsional strain, mechanism is provided that may be operated to depress the free rear end of the lever 90, while upward movement of the forwardly projecting arms 54a and 54b is positively prevented by retaining lugs 92a and 92b that rise from the top flanges 82a and 82b respectively of the repeatedly mentioned girders 18a and 18b and which engage with inwardly turned lips 94a and 95b the top edges of said arms 54a and 54b respectively. For this purpose the rear end of lever 90 carries a pair of transversely spaced parallel tail fins 96a and 96b, the upper edges of which form semicircular recesses within which is seated a transverse member 100. Said member 100 is provided with an aperture that receives in threaded engagement the threaded upper end of a vertically disposed inverted bolt 102 which extends through the vertical slot formed between the tail fins 96a and 96b and an aperture 106 provided in the crossbar 86. By appropriately turning the bolt 102, while its head 112 is engaged behind the edge of said aperture 106 and while the transverse member 100 is prevented from rotation by threaded engagement with the bolt 102 within the above mentioned recesses in the tail fins 96a and 96b, said lever 90 may be depressed to a desired degree; with upward movement of the load supporting arms 54a and 54b, positively prevented by the retaining lugs 92a and 92b, the transverse rod 76 may thus be subjected to a predetermined torsional strain.

Secured to the outer side of arm 54b is an ear 114 which carries an adjustable contact stud 116, and disposed a limited distance below said stud is the actuating button 118 of a normally closed switch 120 that is secured to the girder 18b. Said switch 120 lies in the power circuit of a solenoid 122 (Fig. 5) that controls the position of a pneumatic valve 124 which is supported from the front wall 42 of tank 10 (Fig. 1) and which

governs the position of the hereinbefore mentioned pneumatic cylinder 40. Having reference to Fig. 5, with solenoid 122 in energized condition the pneumatic valve 124 is in a position wherein it directs air from a suitable source of compressed air (not shown) into the space 126 below the piston 128 of cylinder 40 while connecting the cylinder space 130 above the piston 128 to the outside atmosphere. Under these conditions the piston rod 44 is retracted, as shown in Fig. 5, which means that the two pinching rods 36 and 38 are withdrawn from the resilient spout portion 34 so that material may flow from the tank into a bag engaged over the terminal end 28 of the spout structure. However, as the weight of the material in the bag on saddle 46 increases, and the downward pull on the scale arms exceeds the force generated by the angular deflection of steel rod 76 as established by adjustment of bolt 102, the arms 54a and 54b begin to descend, and as soon as the weight of the material in the bag reaches a value proportional to the sum of the angular deflection of the rod, as established by adjustment of bolt 102, and the angular deflection necessary to bring the contact stud 116 in lug 114 on arm 54b against the actuating button 118, the switch 120 is thrown open. As a result, the solenoid 122 is de-energized, and a spring 132 (Fig. 5) within the valve 124 reverses the position of said valve, causing it to direct compressed air into the cylinder space 130 above the piston 128 and connect the cylinder space 126 below the piston 128 to the outside atmosphere. This, in combination with a restore spring 134 within the pneumatic cylinder 40, projects the piston rod 44 rapidly from the cylinder, which is effective to close the pinching rods 36 and 38 upon the resilient portion of the spout structure. Thus, flow of material through the spout will cease promptly as soon as the weight of the material in the bag reaches the value established by adjustment of the screw bolt 102 at the end of lever 90. To assure that the arms 54a and 54b descend in unison under the weight of the load supported therefrom, they may be rigidly connected with each other by cross bracers 135a and 135b (Fig. 3).

When the filled bag is removed from saddle 46 the torsional resilience of steel rod 76 raises the arms 54a and 54b into engagement with the lips of the retaining lugs 92a and 92b, causing contact stud 116 to release the actuating button of switch 120. This permits the switch 120 to close. To prevent immediate re-energization of solenoid 122, which would be effective to withdraw the pinching rods from the resilient portion of the spout and thus immediately initiate flow of fluidized material through the spout, the power circuit of solenoid 122 includes also a normally open switch 136 (Fig. 5) that is situated at a suitable point near the spout structure 26 and which is closed by the hereinbefore mentioned clamping mechanism 30 whenever said mechanism is placed into the position where it retains a bag upon the spout and thereby depresses contact stud 30m. Thus, energization of solenoid 122 with resultant resumption of material flow through the spout cannot occur until another bag has been engaged over the spout and the clamping mechanism 30 has been manipulated to hold the bag on the spout.

In the operation of the bag filling apparatus, the operator places an empty bag on the saddle 46 with the open end thereof over the spout 26. He then manipulates the handle 30g to close the clamp mechanism 30 upon the bag so that the bag is securely held in engagement with the spout 26. As soon as the clamp 30a is in full engagement with the bag, the contact stud 30m closes contacts 136 (Fig. 5) to complete the electrical circuit to solenoid 122. Energization of the solenoid 122 moves the pneumatic valve 124 into a position, whereby the source of compressed air is connected to the cylinder space 126 below the piston 128, while the cylinder space 130 above the piston 128 is connected to the outside atmosphere. As a result thereof, the piston rod 44 is

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retracted, whereby rods 36 and 38 are withdrawn from the resilient hose 34 of the spout 26 so that the hose 34 is allowed to expand. Fluidized material then flows through the spout 26 to discharge the material within the tank 10.

As the weight of the material accumulating in the bag seated on the saddle 46 increases, the downward pull exerted by the rod 48, as well as by the arms 50a and 50b, increases. The downward pull is transmitted to the scale arms 54a and 54b through the clamp mechanism 60. When the desired quantity of material accumulates in the bag, the downward pull on the scale arms 54a and 54b exceeds the force generated by the angular deflection of the torsion rod 76, which was established by the preload adjustment of the bolt 102. As a result thereof, scale arms 54a and 54b descend sufficiently to bring the contact stud 116 in lug 114 on arm 54b against the actuating button 118. The depression of the actuating button 118 opens contacts 120 to de-energize solenoid 122. De-energization of solenoid 122 enables springs 132 to reverse the position of valve 124, causing the valve 124 to direct compressed air into cylinder space 130 above the piston 128 and connect the cylinder space 126 below the piston 128 to the outside atmosphere. This, in combination with the restored spring 134 within the cylinder 40, projects the piston rod 44 rapidly from the cylinder 40. Consequently, rods 36 and 38 close the resilient hose 34 to stop flow of material to the spout 26.

When the filled bag is removed from the saddle 46, the torsional resiliency of rod 76 raises the scale arms 54a and 54b into engagement with the lips of the retaining lugs 92a and 92b, causing the contact stud 116 to release the actuating button of switch 120. This permits the contacts thereof to close. To enable the filled bag to be removed, the clamp 30a is raised. The raising of clamp 30a removes the force on contact stud 30m, thereby opening contacts 136 to prevent energization of the solenoid 122 until the next bag is placed over the spout 26 and once again the clamp 30a is closed.

The disclosed scale is of simple and compact construction and need only be a few inches in depth; it may readily be adjusted to open the flow-control-switch 120 at any desired weight within a wide range of weights by proper manipulation of bolt 102. It will respond quickly when the material delivered into the bag reaches its desired value, since it does not have to overcome the inertia of a counterweight.

When fluidization of granular or powdered materials is referred to in the above given description and in the following claims, this term is intended to mean not only full fluidization of the said materials, wherein they behave entirely as a liquid but also all those conditions of lesser aeration which reduce their natural angle of repose and will therefore permit said materials to flow down inclined surfaces that slant at angles less than their natural angle of repose.

I claim:

1. A scale comprising a horizontally disposed torsion rod, means for supporting said rod for rotation about its axis, a load supporting arm rigidly secured to said rod and projecting forwardly therefrom, a lever secured to said rod and projecting rearwardly therefrom, means limiting upward movement of said load supporting arm, and means operable to depress said lever beyond the limit set by said limiting means for preloading said rod.

2. A scale comprising a horizontally disposed torsion rod, knife edges supporting the opposite ends of said rod for rotation about its axis, a load supporting arm secured to said rod and projecting forwardly therefrom, a lever secured to said rod and projecting rearwardly therefrom, stop means positioned to limit upward movement of said load supporting arm, means operable to depress said lever to rotate said rod in one angular direction and raise said arm into contact with said stop means and to thereafter twist said torsion rod in said one angular direc-

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tion to apply to said rod a first torsional stress of a predetermined magnitude that is proportional to a given weight, and means on said load supporting arm for receiving the load to be weighed, said means being positioned to apply a second torsional stress on said rod in the opposite angular direction whereby, when said second torsional stress equals said first torsional stress, the load equals said given weight.

3. A scale comprising a horizontally disposed torsion rod, means for supporting said rod for rotation about its axis, a load supporting arm secured to said rod and projecting forwardly therefrom, a lever secured to said rod and projecting rearwardly therefrom, stop means limiting upward movement of said article supporting arm about the axis of rotation of said rod, and adjustable means operable to depress the free end of said lever beyond the limit set by said stop means for preloading said rod, a switch, and means on said arm effective upon descent thereof under the weight of a load supported therefrom to actuate said switch.

4. A scale comprising a horizontally disposed torsion rod, knife edges supporting the opposite ends of said rod for rotation about its center axis, an arm rigidly secured to said rod and projecting forwardly therefrom, means on said arm for pivotally supporting a load to be weighed, a lever secured to said rod and projecting rearwardly therefrom, means for positively limiting upward rotation of said arm, and means for applying a predetermined force to said lever, whereby a torsional strain of predetermined magnitude is imparted to said rod.

5. A scale comprising a horizontally disposed torsion rod, knife edges supporting the opposite ends of said rod for rotation about its center axis, a pair of arms secured to the opposite ends of said rod and projecting forwardly therefrom, means pivotally supported from said arms for supporting a load to be weighed, a lever secured to a center portion of said rod and projecting rearwardly therefrom, means for positively limiting upward rotation of said arms, and means operable to depress the end of said lever so as to subject said rod to torsional deformation.

6. A scale comprising a horizontally disposed torsion rod, knife edges supporting the opposite ends of said rod for rotation about its center axis, a pair of arms secured to the opposite ends of said rod and projecting forwardly therefrom, means pivotally supported from said arms for supporting an article to be weighed, a lever secured to a center portion of said rod and projecting rearwardly therefrom, means for positively limiting upward rotation of said arms, and means operable to depress and fixedly position the end of said lever for subjecting said rod to torsional deformation for preloading said rod beyond the limit set by said limiting means.

7. A scale comprising a horizontally disposed rod, means supporting said rod for rotation about its center axis, a pair of arms secured to the opposite ends of said rod and projecting forwardly therefrom, means pivotally supported from said arms for supporting a load to be weighed, a lever secured to a center portion of said rod and projecting rearwardly therefrom, means for positively limiting upward rotation of said arms, means operable to positively depress and fixedly position the end of said lever so as to subject said rod to torsional deformation, a switch positioned adjacent to one of said arms, and means directly responsive to downward rotation of said arms under the weight of a load on said load supporting means to actuate said switch.

8. A scale comprising a horizontally disposed rod, knife edges supporting the opposite ends of said rod for rotation about its center axis, a pair of arms secured to the opposite ends of said rod and projecting forwardly therefrom, means pivotally supported from said arms for supporting a load to be weighed, a lever secured to a center portion of said rod and projecting rearwardly therefrom, means for positively limiting upward rotation of

said arms, means operable to positively depress and fixedly position the end of said lever to subject said rod to predetermined torsional deformation, a switch positioned adjacent to one of said arms and means directly responsive to downward rotation of said arms under the weight of a load on said load supporting means to actuate said switch.

9. In a bag filling machine having a tank adapted to contain powdered or granular material in a state of fluidization, a discharge spout at the lower end of said tank adapted to be engaged by the material-receiving snout of a bag and control mechanism operable to block the flow of material through said spout; a scale for limiting the amount of material filled into the bag to predetermined weights comprising a horizontally disposed rod, means rotatably supporting said rod, arms secured to said rod and projecting forwardly therefrom, means pivotally suspended from the free ends of said arms for supporting a bag in material-receiving position, a lever firmly secured to said rod and projecting rearwardly therefrom, stop means positively limiting upward rotation of said arms, means operable to depress the free end of said lever beyond the limit set by engagement of said arms with said stop means, to subject said rod to predetermined torsional deformation, and means responsive to descent of said arms under the weight of the material accumulating in a bag on said bag supporting means to activate the spout control mechanism to block the spout.

10. In a bag filling machine having a tank adapted to contain powdered or granular material in a state of fluidization, a discharge spout at the lower end of said tank adapted to be engaged by the material-receiving snout of a bag and control mechanism operable to block the flow of material through said spout; a scale for limiting the amount of material filled into the bag to predetermined weights comprising a horizontally disposed steel rod; means including knife edges for supporting said rod for rotation about its axis; a pair of arms secured to the opposite ends of said rod and projecting forwardly therefrom; means suspended for limited rotational movement from the free ends of said arms for supporting a bag in material-receiving position thereon; a lever firmly secured to an intermediate portion of said rod and projecting rearwardly therefrom; stop means positively limiting upward rotation of said arms; means operable to depress the free end of said lever beyond the limit set by engagement of said arms with said stop means; and means responsive to descent of said arms, under the weight of the material accumulating in a bag on said bag supporting means exceeding the limit set by adjustment of said lever depressing means, to activate the spout control mechanism to block the spout.

11. In a bag filling machine having a tank adapted to contain powdered or granular material in a state of fluidization, a discharge spout at the lower end of said tank adapted to be engaged by the material-receiving opening of a bag, and a control mechanism operable to block the flow of material through said spout; a scale for limiting the amount of material deposited into the bag to predetermined weights and comprising a horizontally disposed rod, means rotatably supporting said rod, arms secured to said rod and projecting forwardly therefrom, means pivotally suspended from the free ends of said arms for supporting a bag in material-receiving position, a lever secured to said rod and projecting rearwardly therefrom, means operable to depress the free end of said lever to subject said rod to predetermined torsional

deformation, and means responsive to descent of said arms under the weight of the material accumulating in the bag on said supporting means to activate the spout control mechanism to block the spout.

12. In a container filling machine having a vessel adapted to contain material, a discharge spout at the lower end of said vessel adapted to cooperate with a material-receiving opening of a container, and a control mechanism operable to control the flow of material to said discharge spout; a scale for limiting the amount of material deposited into the bag to predetermined weights and comprising a horizontally disposed rod, means rotatably supporting said rod, an arm secured to said rod and projecting forwardly therefrom, means suspended from the free end of said arm for supporting a container in material-receiving position, a lever secured to said rod and projecting rearwardly therefrom, means operable to depress the free end of said lever to subject said rod to predetermined torsional deformation, and means responsive to descent of said arm under the weight of material accumulating in the container on said supporting means and operatively connected to said spout control mechanism to activate the spout control mechanism for controlling the flow of material through said discharge spout.

13. In a scale, a horizontally disposed rod having downwardly directed recesses extending from the axis of said rod at opposite ends thereof, knife edges received by said recesses in axial alignment with said rod for rotatably supporting said rod, a load supporting arm secured to said rod and projecting forwardly therefrom, a stop member above said arm, a lever secured to said rod and projecting rearwardly therefrom, and means for applying a predetermined force upon said lever, whereby a torsional strain of predetermined magnitude is imparted to said rod.

14. In a scale, a horizontally disposed rod having downwardly directed recesses extending from the axis of said rod at opposite ends thereof, knife edges received by said recesses in axial alignment with said rod, a load supporting arm secured to said rod and projecting forwardly therefrom, a stop member above said arm, a bearing rotatably supporting said rod at the center thereof, a bifurcated lever secured to said rod at either side of said bearing and projecting rearwardly from said rod, and means for applying a predetermined force to said lever, whereby a torsional strain of predetermined magnitude will be imparted to said rod.

References Cited in the file of this patent

UNITED STATES PATENTS

299,758	Du Brul	June 3, 1884
618,384	Richards	Jan. 24, 1899
691,437	Bogue	Jan. 21, 1902
1,544,432	Carlstedt	June 30, 1925
1,628,268	Nelson	May 10, 1927
1,827,560	Binkley	Oct. 13, 1931
1,851,017	Middelboe	Mar. 29, 1932
2,009,408	Middelboe	July 30, 1935
2,303,140	Sackett	Nov. 24, 1942
2,450,279	Guy	Sept. 28, 1948
2,599,159	Breedlove	June 3, 1952
2,625,820	Whitehead	Jan. 20, 1953
2,770,439	Stafford	Nov. 13, 1956

FOREIGN PATENTS

898,689	Germany	Dec. 3, 1953
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