May 26, 1925. 1,539,772

A. R. ROBERTSON ET AL

SAFETY DEVICE FOR CENTRIFUGAL MACHINE BASKETS

Filed July 20, 1923 4 Sheets-Sheet 1

FIG. 3.

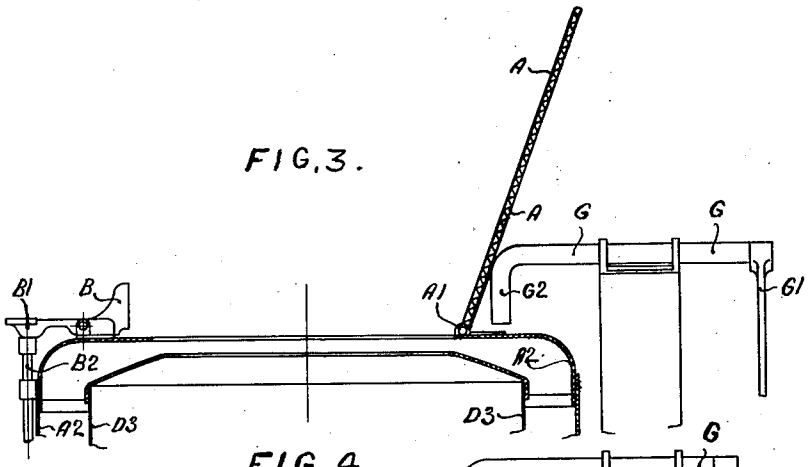


FIG. 4.

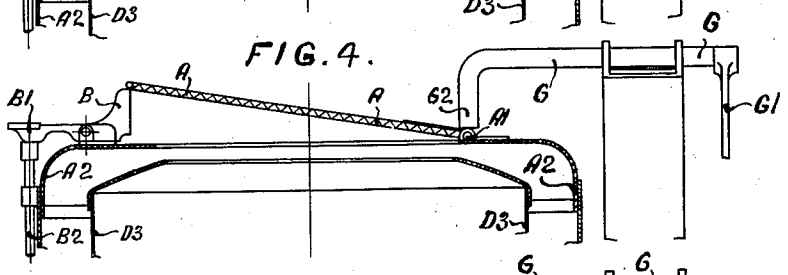
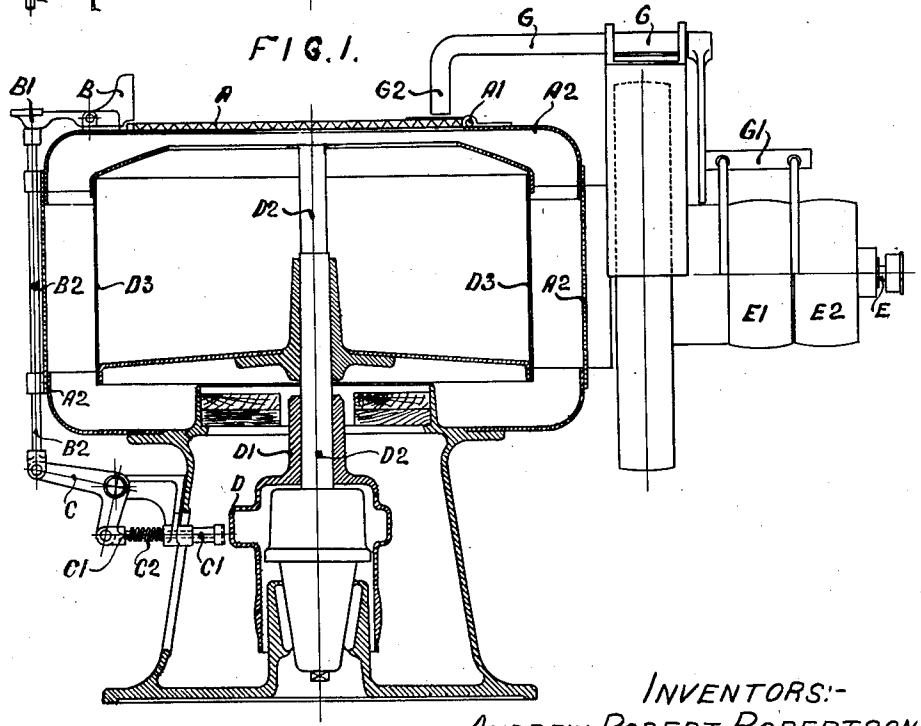


FIG. 1.



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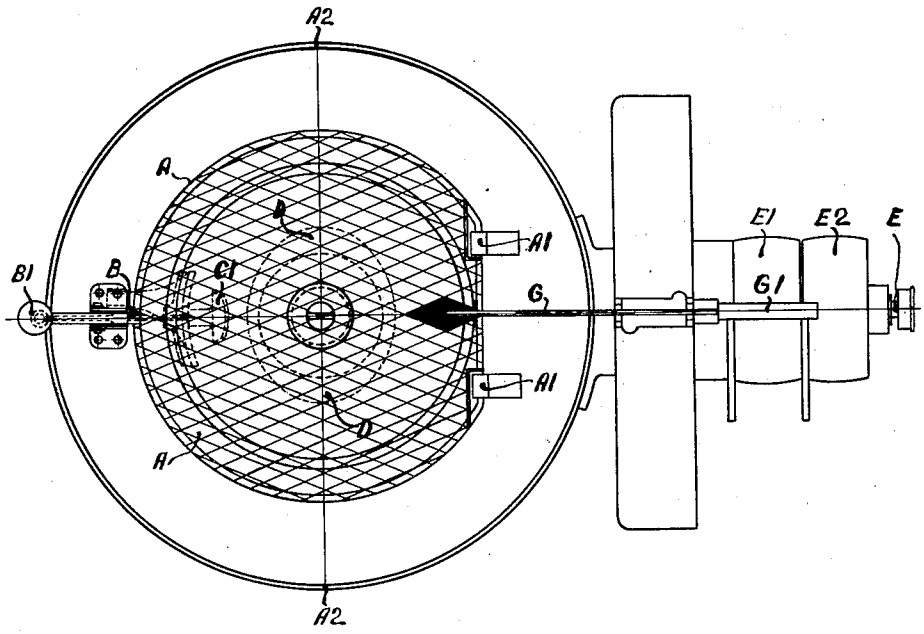
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SAFETY DEVICE FOR CENTRIFUGAL MACHINE BASKETS

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FIG. 2.



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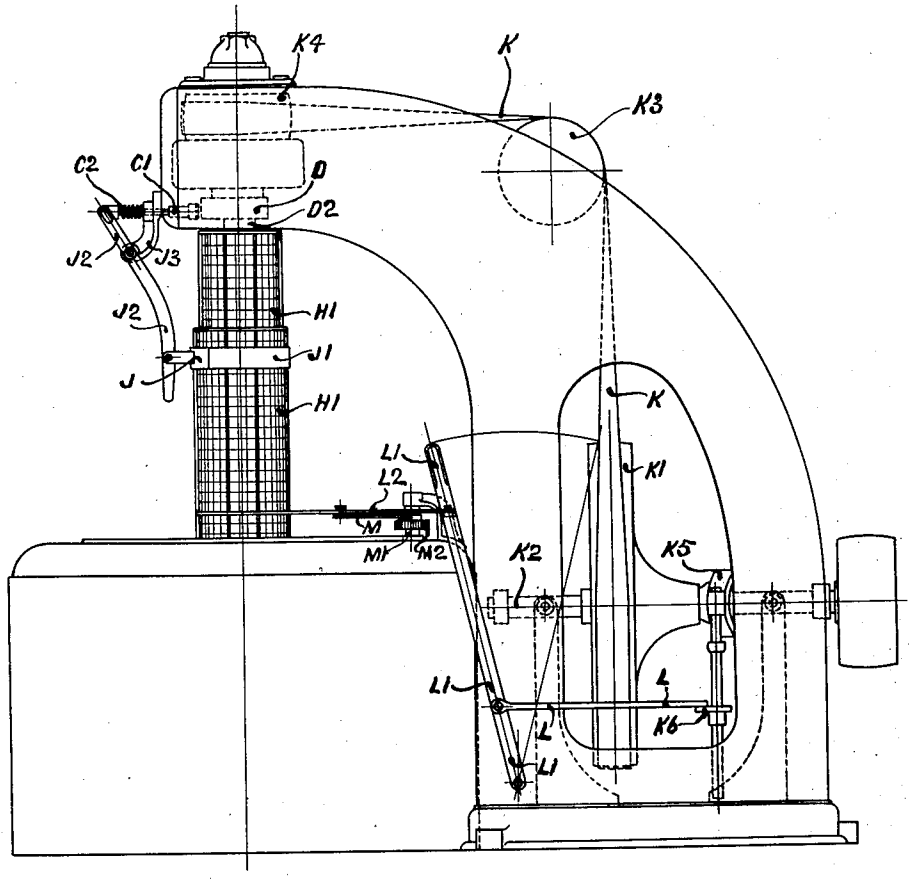
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SAFETY DEVICE FOR CENTRIFUGAL MACHINE BASKETS

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FIG. 5.



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SAFETY DEVICE FOR CENTRIFUGAL MACHINE BASKETS

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FIG. 6.

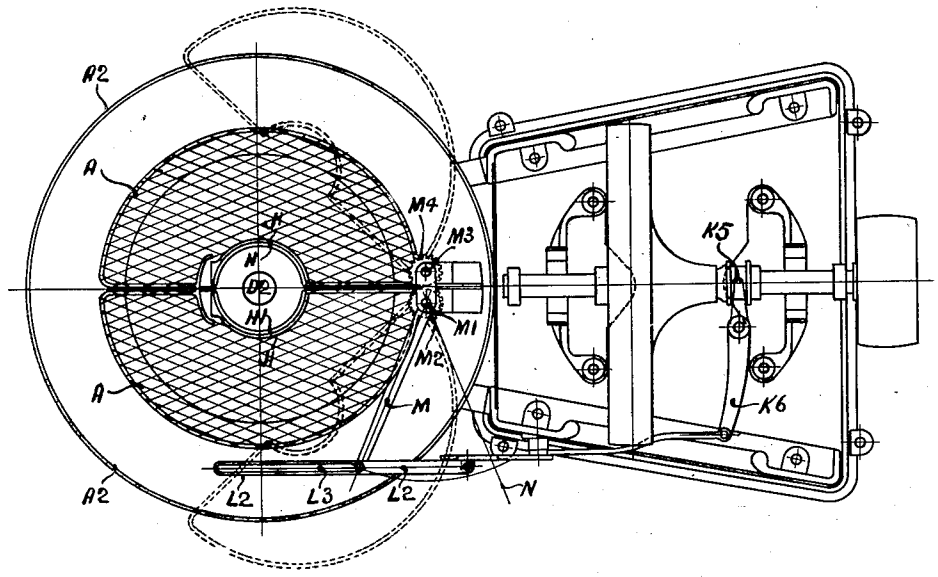
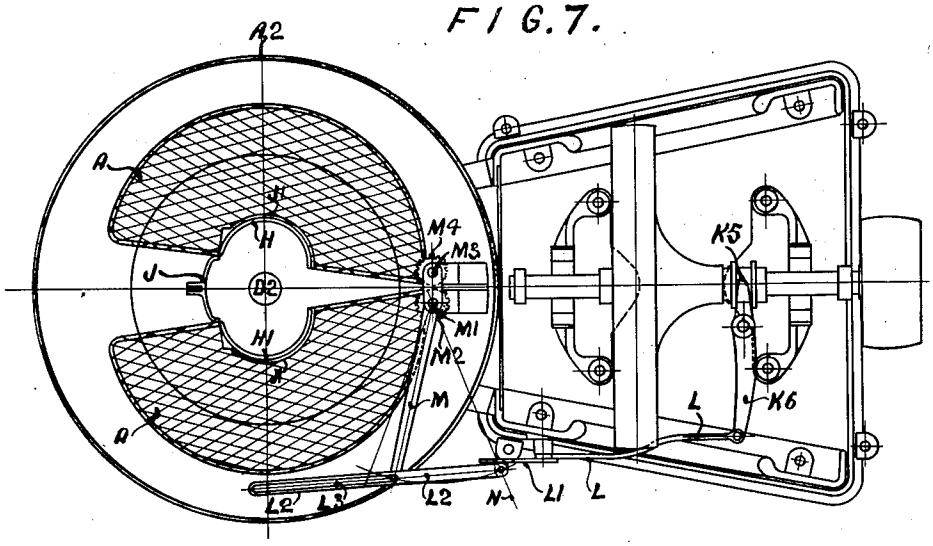


FIG. 7.



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Patented May 26, 1925. 1,539,772

UNITED STATES PATENT OFFICE.

ANDREW ROBERT ROBERTSON AND ALEXANDER FRASER DUNSMORE, OF GLASGOW, SCOTLAND.

SAFETY DEVICE FOR CENTRIFUGAL-MACHINE BASKETS.

Application filed July 20, 1923. Serial No. 652,714.

To all whom it may concern:

Be it known that we, ANDREW ROBERT ROBERTSON and ALEXANDER FRASER DUNSMORE, both British subjects, and residents of Glasgow, Scotland, have invented certain new and useful Safety Devices for Centrifugal-Machine Baskets; of which the following is the specification.

The invention has for its object to provide for centrifugal machines, more particularly of that class usually known as hydro-extractors, a safety device in connection with the usual hinged cover for the basket or monitor-case and the rotating spindle which will definitely prevent access to the basket so long as the latter is rotating (even at low speed).

The improved device which is applicable to under-driven and also to suspended machines, and in connection with practically any type of hinged or pivoted protective lid or cover for the basket or monitor case and the rotating spindle, comprises essentially a rotatory cam or eccentric on the spindle of the machine, or upon another rotatory part, or driven from the spindle or other part, and a detent retaining the lid or cover in its closed position and operatively connected to an element adapted to be projected into the path of the cam or eccentric by movement of the detent into the position in which the latter releases the cover or lid so that it may be opened for access to the basket.

Thus, if it be attempted to move the detent so as to free the lid or cover and allow it to be opened while the basket (and so the cam or eccentric) is still rotating, the detent will move the element into the path of the cam or eccentric and the latter encountering the element will thrust the detent back into the lid-retaining position.

Two examples of the carrying out of the invention are shown on four accompanying sheets of explanatory drawings. In these drawings Figure 1, Sheet 1, is an elevation partly in section and Figure 2, Sheet 2, a plan of an example of the invention as applied to an under-driven machine. Figures 3 and 4, Sheet 1, are elevations of the upper portions of the machine showing the cover in different positions. Figure 5, Sheet 3, is a side elevation and Figures 6 and 7, Sheet 4, horizontal plans partly in section showing the application of the invention to a suspended machine.

In carrying out the invention according to the example shown in Figures 1 to 4, the machine is of the usual under-driven type having a lid A hinged at A^1 to the monitor case A^2. The lid is retained in the closed position by a detent finger B, pivoted oppositely to the hinge on the monitor case and extending over the adjacent part of the lid. In order to open the lid it is thus necessary that the finger B should be raised with the consequent depression of an extended tail piece B^1 upon it. This tail piece bears on the upper end of a vertical endwise movable spindle B^2, the lower end of which is operatively connected through a bell crank lever C to one end of a bolt-like element C^1 adapted by the downward movement of the spindle B^2 to be thrown, against the action of the spring C^2, into the path of a cam D on a sleeve D^1 on the spindle D^2 carrying the basket D^3 of the machine. The spring C^2 normally holds the bolt C^1 clear of the path of the cam D.

If it be attempted to lift the detent B and open the lid or cover A while the basket D^3 and so the cam or eccentric D is still rotating, the detent B will, through its action on the spindle B^2 and bell-crank lever C, move the bolt-like element C^1 into the path of the eccentric D, and the latter encountering the bolt C^1 will move the rod B^2 and bell-crank lever C in the opposite direction, thus thrusting the detent B back into the lid-retaining position shown in Figures 1 and 2. Therefore even although the power is shut off and the rotation of the basket is slowing down it will be impossible to hold the detent B up and raise the cover A until the machine has actually stopped.

The machine is driven in the usual manner from a shaft E having on it fast and loose pulleys E^1, E^2 to receive a driving belt (not shown) and to prevent the machine from being started unless the cover A is first brought into the closed position, the handle G for operating the belt shifting fork G^1 has on it in known manner a downwardly extending part G^2 which is in close proximity to the surface of the cover when the latter is in the closed position. It therefore the cover A be lowered into the position shown in Figure 4 where it is not com-

pletely closed but rests on the top of the detent B and it be attempted to move the handle so as to shift the belt on to the fast pulley E^1, the downward extension G^2 will, at once, encounter the cover and prevent movement of the belt on to that pulley. The detent must first therefore be raised whilst the machine is stationary to allow the cover to fall beneath it before the starting handle can be moved.

In carrying out the invention in the case of a suspended machine and as shown in Figures 5, 6, and 7, the cover A is in two oppositely hinged parts having semi-tubular upstanding extensions H, H^1 embracing the spindle D^2 and acting as a guard therefor in usual manner. When the cover is in the closed position (Figures 5 and 6) the semi-tubular extensions are locked together (so holding the cover closed) by a bolt-like detent J engaging jointly semi-cylindrical bands J^1 thereon. The detent J is fixed near the lower end of a lever J^2 pivoted in a bracket J^3 and connected to a bolt-like element C^1 adapted to be thrown against the action of a spring C^2 into the path of a cam or eccentric D on the spindle D^2 upon attempted withdrawal of the detent J whilst the machine is still running. This action of the eccentric D throws the detent J back into the position which prevents movement of both the extensions H, H^1 and the cover.

The machine in this example is driven by a belt K passing round a pulley K^1 loose on a constantly running shaft K^2 over jockey-pulleys K^3 to a driving pulley K^4 on the spindle D^2 of the machine, the pulley K^1 being connected to or disconnected from the shaft K^2 in the usual manner by a clutch K^5 operated through a lever K^6 and a link L by a starting handle L^1. This handle has connected to it a link L^2 having in it a lost motion slot L^3 into which extends a pin on one end of a lever M connected at its other end to a spindle M^1 forming the pivot of one half of the cover A and carrying a pinion M^2 gearing with a second pinion M^3 on the pivot pin M^4 of the other half of the cover A.

When the power is shut off by moving the handle L^1 to the right in Figure 5 to so operate the clutch K^5 as to disconnect the pulley K^1 from the driving shaft K^2 the link L^2 is also so moved that the pin on the end of the lever M is then at the outer end of the slot L^3 and when the machine has stopped running thereby permitting the detent J to be withdrawn from engagement with the bands J^1 the cover A and tubular extensions H, H^1 can then be turned with their pivots M^1, M^4 into the open positions shown by dotted lines in Figure 6. This movement also causes the lever M to travel to the position shown by the line N in which position the pin on its end will again be brought to the inner end of the slot L^3 in the link L^2. When it is desired to again start the machine the handle L^1 is moved to the left in Figure 5 to so operate the clutch K^5 as to connect the pulley K^1 to the driving shaft K^2. This movement causes the link L^2 to travel to the left in Figures 6 and 7, and as the pin on the end of the lever M is then at the inner end of the slot that lever is made to travel outwards again and rotate the pinions M^2, M^3 so that the halves of the cover are again made to approach each other. During this movement when the parts reach the position shown in Figure 7 the bands J^1 on the extensions H, H^1 encounter the detent J and force it back, against the action of the spring C^2, so that they once more meet on the inner curved side of the detent when the cover and semi-tubular extensions have reached the closed position. The cover and tubular extensions are thus automatically brought into the closed position and locked in that position by the detent J on the starting of the machine.

What we claim is:—

1. A safety device for use in connection with covers for centrifugal machines, having a cam on the machine spindle, a detent pivoted on a stationary part of the machine and extending over the edge of the cover, in combination with a bolt-like element adapted to engage said cam, a spring normally holding the bolt clear of the path of the cam and means connecting the detent to the bolt.

2. A safety device for use in connection with covers for centrifugal machines, having a cam on the machine spindle, a detent pivoted on a stationary part of the machine and extending over the edge of the cover, in combination with a bolt-like element adapted to engage said cam, a spring normally holding the bolt clear of the path of the cam and means connecting the detent to the bolt and an extension on the handle of the usual stopping and starting mechanism which extension will engage the cover and prevent movement of the handle unless the cover retaining detent is first raised to allow the cover to lie beneath it.

3. A safety device for use in connection with the usual covers for centrifugal machines and comprising a cam on the machine spindle, a detent pivoted on the machine case and extending over the edge of the cover, a tail piece on the detent, a movable spindle on which the tail piece bears, a bolt-like element capable of engaging the cam, a bell-crank lever connecting the spindle to the bolt, and a spring normally holding the bolt clear of the path of the cam.

4. A safety device for use in connection

with the usual covers for centrifugal machines and comprising a cam on the machine spindle, a detent pivoted on the machine case and extending over the edge of the cover, a tail piece on the detent, a movable spindle on which the tail piece bears, a bolt-like element capable of engaging the cam, a bell-crank lever connecting the spindle to the bolt, a spring normally holding the bolt clear of the path of the cam, and an extension on the handle of the usual stopping and starting mechanism which extension will engage the cover and prevent movement of the handle unless the cover retaining detent is first raised to allow the cover to lie beneath it.

In testimony whereof we have signed our names to this specification.

ANDREW ROBERT ROBERTSON.
ALEXANDER FRASER DUNSMORE.