

DEVICE FOR REGULATING THE FEEDING OF POWER IN HOISTING PLANTS.

962,762.

This technical drawing illustrates a mechanical assembly, likely a pump or a valve actuator, with various components labeled with numbers and letters. The device is shown in two states: a primary state and a secondary state indicated by dashed lines.

The main components and their labels are as follows:

- 1**: A vertical rod or shaft passing through the center of the device.
- 2**: A horizontal rod or lever arm connected to the vertical rod.
- 3**: A horizontal rod or lever arm, similar to 2, positioned below it.
- 4**: A horizontal rod or lever arm, similar to 2 and 3, positioned above them.
- 5**: A horizontal rod or lever arm, similar to 2, 3, and 4, positioned to the right.
- 6**: A horizontal rod or lever arm, similar to 2, 3, 4, and 5, positioned to the left.
- 7**: A horizontal rod or lever arm, similar to 2, 3, 4, 5, and 6, positioned to the right.
- 8**: A horizontal rod or lever arm, similar to 2, 3, 4, 5, 6, and 7, positioned to the left.
- 9**: A horizontal rod or lever arm, similar to 2, 3, 4, 5, 6, 7, and 8, positioned to the right.
- 10**: A horizontal rod or lever arm, similar to 2, 3, 4, 5, 6, 7, 8, and 9, positioned to the left.
- 11**: A horizontal rod or lever arm, similar to 2, 3, 4, 5, 6, 7, 8, 9, and 10, positioned to the right.
- 12**: A horizontal rod or lever arm, similar to 2, 3, 4, 5, 6, 7, 8, 9, 10, and 11, positioned to the left.
- 13**: A horizontal rod or lever arm, similar to 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12, positioned to the right.
- 14**: A horizontal rod or lever arm, similar to 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, and 13, positioned to the left.
- 15**: A horizontal rod or lever arm, similar to 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, and 14, positioned to the right.
- 16**: A horizontal rod or lever arm, similar to 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15, positioned to the left.
- 17**: A horizontal rod or lever arm, similar to 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, and 16, positioned to the right.
- 18**: A horizontal rod or lever arm, similar to 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, and 17, positioned to the left.
- 19**: A horizontal rod or lever arm, similar to 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, and 18, positioned to the right.
- 20**: A horizontal rod or lever arm, similar to 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, and 19, positioned to the left.
- 21**: A horizontal rod or lever arm, similar to 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, and 20, positioned to the right.

Additionally, there are directional labels:

- forw.**: Forward, indicated by an arrow pointing to the right.
- backw.**: Backward, indicated by an arrow pointing to the left.

The drawing also includes a detailed view of a component labeled **b**, which appears to be a pump or a valve, with a handle and a rod.

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To all whom it may concern:

Be it known that I, JACOB IVERSEN, a subject of the German Emperor, and resident of Wilhelmsplatz 1^a, Charlottenburg, near Berlin, Germany, have invented certain new and useful Improvements in Devices for Regulating the Feeding of Power in Hoisting Plants, of which the following is a specification.

My invention relates to a device for regulating the feeding of power in hoisting plants, its object being to prevent accidents which might occur owing to a faulty manipulation of the controlling gear or in the power regulating mechanism at the beginning or end of a trip.

The invention consists in regulating the feeding of power by means of suitable devices in such a manner so as to cause the power to be increased only when the reversing lever is being correctly manipulated. By the use of suitable appliances it is of course also possible to obtain an automatic cut-off of the power feeding. According to the invention, the throwing-over is also obtained by the depth indicator, as is already the case in known devices. The present arrangement differs from those existing already in the first place in the application of depth indicators and regulating mechanisms of ordinary construction, and in the special driving apparatus so that the connecting gear which is thrown over by the depth indicator transmits the movement of the reversing-lever directly on to the regulating mechanism.

The accompanying drawing gives an example of a device for carrying out the invention, the said device being shown diagrammatically in elevation.

a is the spindle-apparatus or depth-indicator operated from the engine shaft; *b* is a throttle-valve for regulating the power supply; *c* is the reversing-shaft and *d* is the lever operating same.

The traveling nut 1, the movement of which corresponds to that of the cages at the completion of a trip, bears against one of the two adjustable stop-rings 2 or 3 and so transmits its movement through the rod 4, the double lever 5, and the connecting rod 6, on to the push-bar 7, which turns about the pivot 8 on the free end of the three-armed lever 9, for operating the throttle valve *b*, and which is actuated by the rocking lever 10 fixed to the reversing-shaft *c*.

In the drawing, the spindle apparatus or indicator is shown in that position in which the cage is halfway down the pit, and the parts 2 to 7 are held in their median-position by means of the double-acting spring-box 11.

In order to explain clearly the operation of the arrangement, I will assume that the engine is running backward and that the cage, while ascending, is nearing the hang-bench or landing-stage. The various members of the spindle apparatus will then be moved in the direction shown by the arrows owing to the nut 1 pushing against the ring 2, and finally bring the rod 7 in the position shown by dotted lines. It will be seen from the drawing, that an increase of power at this stage cannot be obtained by moving the reversing lever *d* farther in the direction of the backward moving of the engine because the lever *c* is unable to actuate the bar 7. Should the reversing lever *d* however be placed in the forward position so as to supply steam to the back of the piston, the left arm of the lever *c* then presses down the rod 7 to open the valve *b*, and so provides for the increase of the power-supply necessary for the successful reversing of the engine. By pulling back the reversing lever, the throttle valve will be closed again by the counterweight 12. By means of this arrangement it is therefore possible to restrict the power-supply for the engine to the amount necessary for the safety of the service, without however having to forego the use of the full power when cushioning by steam.

In order to insure for the greatest possible safety in working, it is advisable to connect devices of the nature herein described, to a depth-indicator or like apparatus, by means of which the power is automatically cut off at the end of the trip. The drawing shows a very simple combination of this kind. A rail 13, is placed under the spindle *a* operating the traveling-nut 1, and is guided by means of two bent levers 15 and 16 connected together by the rod 14. Two curved plates 17 and 18 are fixed to the rail 13. Near the end of the trip the roller 19 fixed to the nut 1 bears against one of these curved plates, plate 17 for example, and the whole of the rail 13 is pushed down; the levers 16 and 9 connected by the rod 20, are thereby moved and the power supply is cut off through the closing of the valve *b*.

In order to move the lever 9 independently of lever 16 etc. by means of the push bar 7, the lever 16 is not firmly fixed to the rod 20 but engages with a pin in a slot provided in the rod 20. At the next trip in descending, the power is increased by pushing forward the lever *d* and thereby depressing the bar 7. An incorrect manipulation of the reversing lever for backward running cannot cause any accident as a corresponding movement of the engine which might cause the cage to rise too high is rendered quite impossible through the automatic cut-off. The present arrangement therefore provides against an excessive raising of the cage, not only at the end, but also at the beginning of each trip. When therefore, the lever *d* is pushed forward, the bar 7 will be depressed and the valve *b* will be opened and cause the engine to start. The roller 19 slides out of contact with the plate 17, and the whole lever mechanism is returned to its initial position by the action of the weight 21 exceeding the weight 12 fixed to the lever 9 of the throttle valve.

The attendance of the machine is greatly simplified by the adoption of such a combined safety device, as the regulation of the power-supply is no longer effected by the engine-man as heretofore, but is effected automatically in the correct way, and further the safety of working is greatly enhanced as the attendant is relieved, and that an excessive raising of the cage is impossible even with a wrong manipulation of the reversing lever.

It is evident that the arrangement described herein is not the only possible way of carrying out this system. The number of combinations of such apparatus with depth indicators or such like appliances, in order to obtain the due cutting off of the power is very great.

What I do claim as my invention and desire to secure by Letters Patent is:—

1. A device for controlling the power supply in hoisting plants comprising the combination of a depth-indicator, a power regulating device, lever mechanism adapted to act upon the said power regulating mechanism and to be reversed by the said depth-indicator, the reversing lever of the engine, and an operating lever turned by said reversing lever and adapted to control the

said power regulating device by means of said lever mechanism, substantially as and for the purpose set forth.

2. A device for controlling the power supply in hoisting plants comprising the combination of a depth-indicator, a power regulating device, a push-bar adapted to operate the said power regulating mechanism, lever mechanism operated by the said depth indicator and adapted to reverse the said push bar, the reversing lever of the engine, and an operating lever moved by the said reversing lever and adapted to move the said push bar, substantially as and for the purpose set forth.

3. A device for controlling the power supply in hoisting plants comprising the combination of a depth-indicator, a power regulating device, lever mechanism adapted to act upon the said power regulating mechanism and to be reversed by the said depth indicator, the reversing lever of the engine, an operating lever turned by said reversing lever and adapted to control the said power regulating device by means of said lever mechanism, and means in connection with the said depth indicator for automatically closing the said power regulating mechanism at the end of each trip, substantially as and for the purpose set forth.

4. A device for controlling the power supply in hoisting plants comprising the combination of a depth-indicator, a power regulating device, a push bar adapted to operate the said power regulating mechanism, lever mechanism operated by the said depth indicator and adapted to reverse the said push bar, the reversing lever of the engine, an operating lever moved by the said reversing lever and adapted to move the said push bar, and a lever mechanism operated by the said depth indicator at the end of each trip and adapted for automatically closing the said power regulating mechanism, substantially as and for the purpose set forth.

In testimony whereof I have hereunto signed my name this first day of February 1908, in the presence of two subscribing witnesses.

JACOB IVERSEN.

Witnesses:

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