

No. 721,481.

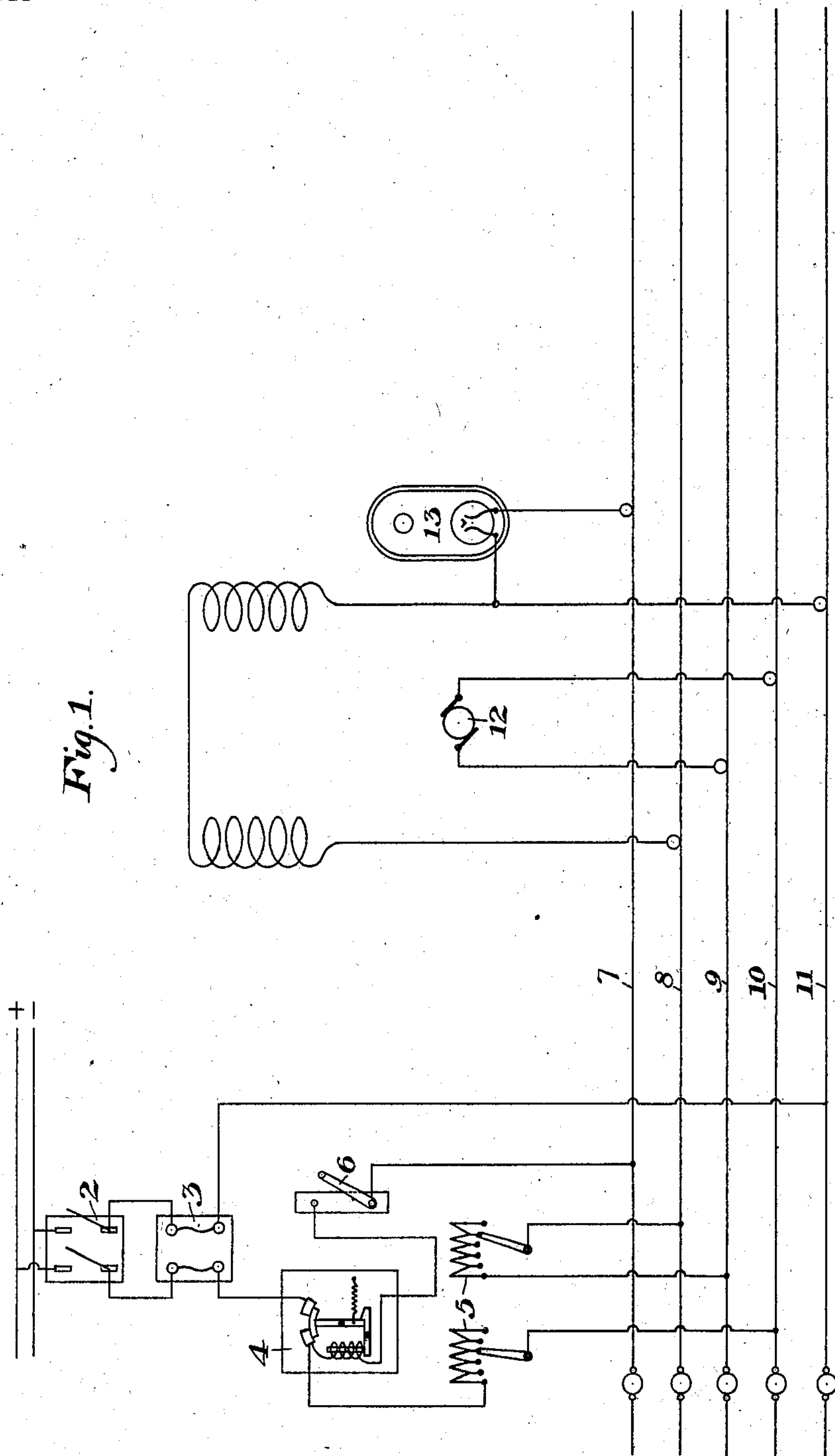
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S. S. WALES.
SAFETY DEVICE FOR HOISTS.

APPLICATION FILED OCT. 9, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES

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UNITED STATES PATENT OFFICE.

SAMUEL S. WALES, OF MUNHALL, PENNSYLVANIA.

SAFETY DEVICE FOR HOISTS.

SPECIFICATION forming part of Letters Patent No. 721,481, dated February 24, 1903.

Application filed October 9, 1902. Serial No. 126,550. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL S. WALES, of Munhall, Allegheny county, Pennsylvania, have invented a new and useful Safety Device for Hoists, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a diagrammatic view showing the system of electric connections for hoists provided with my improved safety device. Fig. 2 is a sectional side elevation of the safety attachment; and Fig. 3 is a front elevation of the same, partly broken away.

My invention relates to the safety stop devices employed in connection with hoists—such as elevators, electric cranes, &c.; and the object of the invention is to provide a simple, self-contained, and easily-attachable device which may be readily applied to any shaft of the hoist.

In the drawings, in which I have shown my device employed in connection with electric cranes, referring to Fig. 1, the parts at the left hand represent the parts in the operator's cage. 2 is the switch; 3, the fuse-block; 4, an automatically-tripped circuit-breaker; 5, the controller, and 6 the circuit-breaker switch.

Of the five trolley-wires shown 7 is that for the circuit-breaker, 8 for the field, 9 and 10 the armatures, and 11 the returns. The motor or motors upon the frame are represented at 12, while 13 illustrates my improved attachment in the safety-circuit.

Referring to Figs. 2 and 3, 14 represents a stub-shaft, which is screwed into the end of any shaft 15 upon the frame by a wrench applied to the squared end 16. This shaft 14 is the only support for the attachment, which hangs pendulum-like upon it and which completes the safety-circuit to actuate the circuit-breaker at the proper point. Upon this shaft is provided a pinion 17, intermeshing with a toothed wheel 18, secured to a collar 19, loosely surrounding a counter-shaft 20. The counter-shaft 20 is mounted in suitable bearings in the lower part of the general case 21, which is supported by bearings in its upper part, which engage the shaft 14. The collar 19 is provided with a pinion 22, engaging

a toothed wheel 23, secured to a collar 24, loosely surrounding shaft 14. This collar 24 is provided with a toothed wheel 25, intermeshing with a toothed wheel 26, which is keyed to the shaft 20. The parts thus form a slow-motion connection between the shaft 15 and a disk 27, secured to the shaft 20 and carrying a tip 28, arranged to complete the safety-circuit whenever it is brought into position between the knobs 29' at the inner ends of the oppositely-extending spring-fingers 29. These spring-fingers are provided with stems 30, which extend down through insulated bushings and facings and are connected in the safety-circuit, as per the diagram. The disk 27 is secured to a protruding portion of the shaft 20 and revolves within a chamber 31, which is separate from the chamber containing the slow-motion gearing. In the latter chamber I preferably provide oil or lubricant 32 in the lower portion, which insures easy operation of the gears, the shafts 20 and 14 being suitably packed, as shown.

In the operation of the system, the slow-motion gearing being arranged to give the desired reduction and cause the circuit-breaker to be opened at the desired point of lift, as the hoist reaches this point the tip 28 completes the circuit by contacting with the buttons, and the usual electromagnetic device trips the circuit-breaker 4, thus cutting off power to the motors. The operator in the cage will then open the switch 6 and reset the circuit-breaker 4, after which he will lower the hoist and then close the switch 6, so that the safety-circuit may be again completed whenever the hoist is raised to such a point that the tip 28 completes the circuit.

The advantages of my invention result from the simplicity of the automatic attachment and the ease with which it may be secured in place. Its pendulum shape holds it in approximately the proper position, and even a considerable swing will have no substantial effect, on account of the large reduction through the slow-motion gearing. The device is easily attached to existing cranes or hoists, as the only point of attachment is the end of one shaft, which may be a gear-wheel shaft or any other. The parts are all protected from dirt and weather, and all gearings run in

oil. The operator can reset the system without leaving the cage, and its operation is sure and safe. The disk or disks may be provided with a plurality of tips or circuit-completers
5 for lifting and lowering, which may be adjustable. The case may be additionally secured to the hoist by another attachment, and many other variations may be made in the form and arrangement of the attachment, the slow-
10 motion connections, &c., without departing from my invention.

I claim—

1. In a safety device for hoists, a shaft arranged to be secured to the end of a driven
15 shaft, and a slow-motion connection and circuit-completer supported on said shaft; substantially as described.

2. In a safety device for hoists, a pendulum-case mounted on a stub-shaft arranged
20 to be connected to the end of a driven shaft on the hoist, and a slow-motion gearing and circuit-completer supported in the case; substantially as described.

3. In a safety device for hoists, a safety-circuit including an automatic circuit-breaker,
25 a switch therefor in the cage, and a pendulum-case supported upon a shaft secured to a rotary shaft of the hoist, said case containing slow-motion connections with a circuit-

completer carried therein; substantially as
described. 30

4. In a safety device for hoists, a case containing a slow-motion gearing arranged to be connected to a shaft of the hoist, and a circuit-closer carried by the case; substantially
35 as described.

5. In a safety device for hoists, a shaft arranged to be secured to the end of a driven shaft, and having a spur-gearing slow-motion connection, and a rotary circuit-closer actuated by said connections; substantially as described. 40

6. In a safety device for hoists an inclosed case containing a spur-gearing slow-motion connection arranged to be connected to the
45 shaft of a hoist, and a rotary circuit-closer actuated thereby; substantially as described.

7. In a safety device for hoists, a case containing slow-motion gearing, and arranged to contain a lubricant, and a separate chamber
50 containing a circuit-closer actuated by the gearing; substantially as described.

In testimony whereof I have hereunto set my hand.

S. S. WALES.

Witnesses:

F. E. GAITHER,
C. P. BYRNES.