No. 639,241. Patented Dec. 19, 1899.

A. IHLENFELDT.

ELEVATOR.

(Application filed Feb. 24, 1899.)

(No Model.)

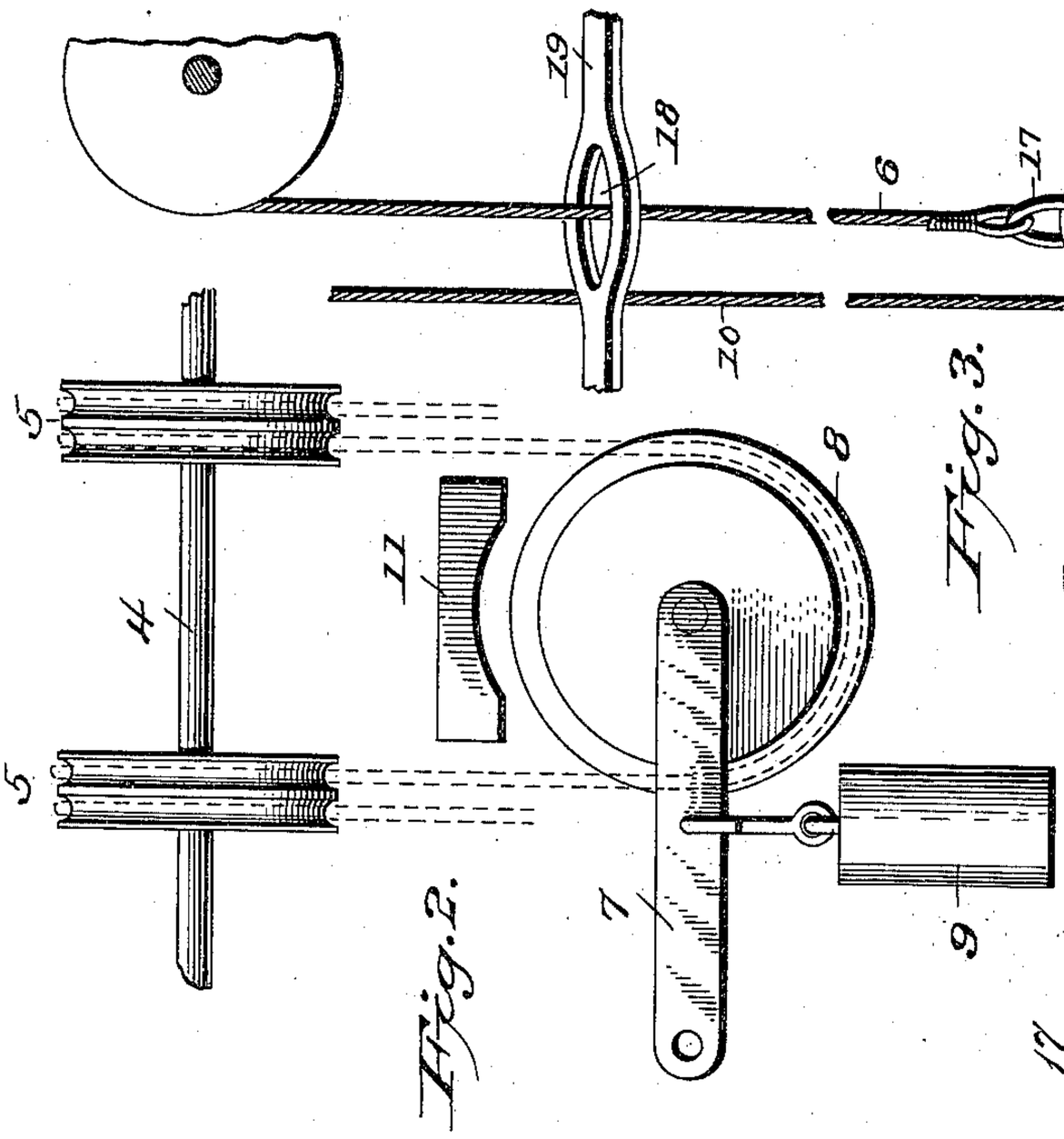

Fig. 2.

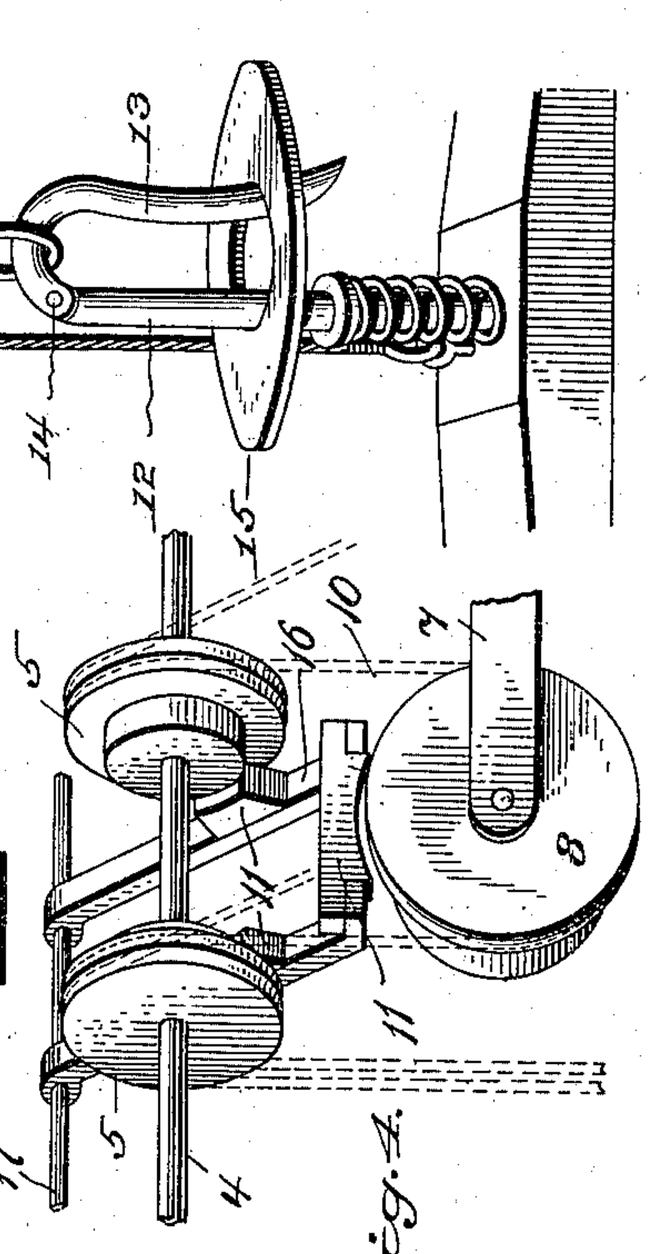

Fig. 3.

Fig. 4.

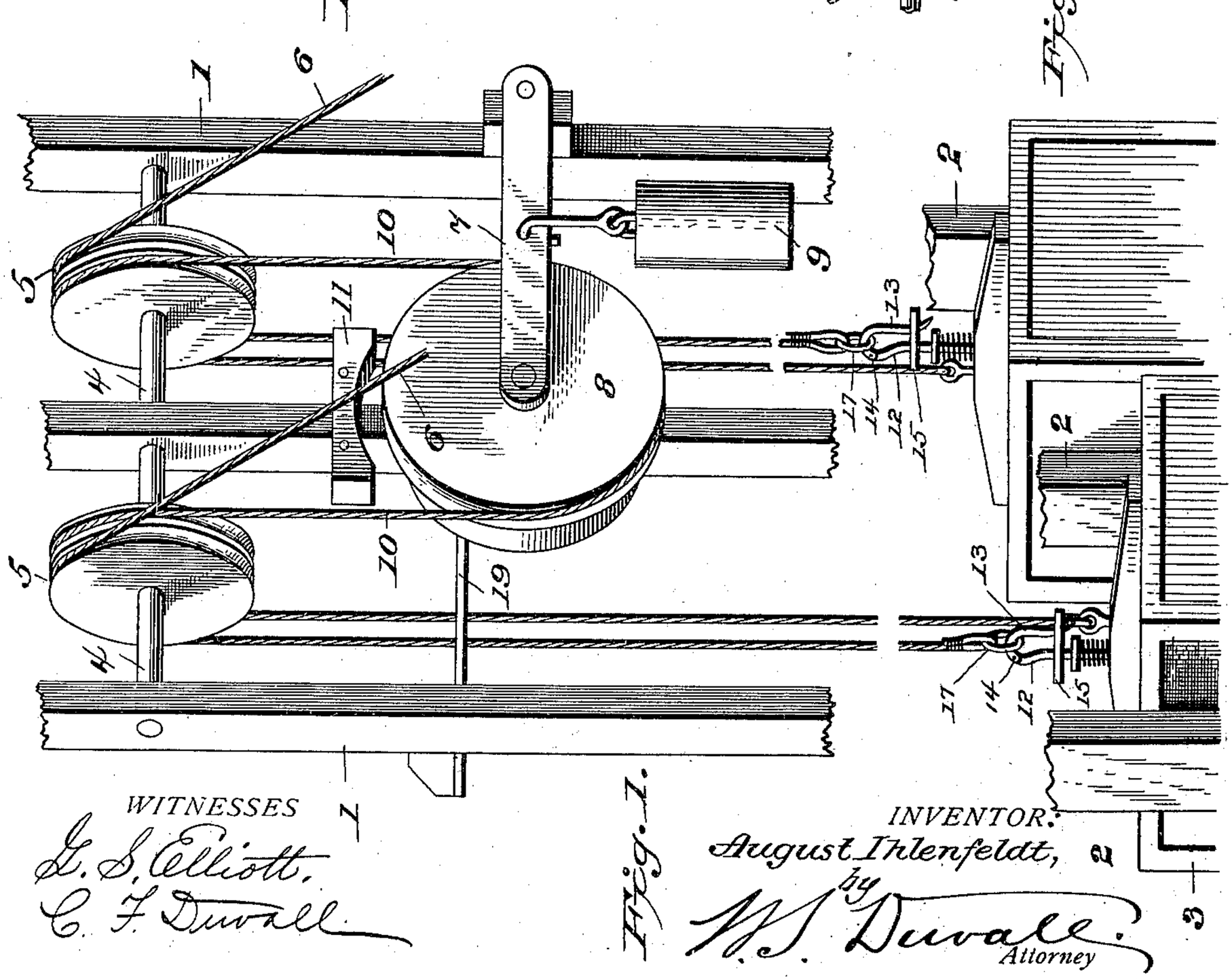

Fig. 1.

WITNESSES

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AUGUST IHLENFELDT, OF SPRINGFIELD, ILLINOIS.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 639,241, dated December 19, 1899.

Application filed February 24, 1899. Serial No. 706,694. (No model.)

To all whom it may concern:

Be it known that I, AUGUST IHLENFELDT, a citizen of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented certain new and useful Improvements in Elevators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in elevators employed either for passengers, freight, or in mine-shafts; and the invention has special reference to certain improvements in the safety devices employed for holding or decreasing the descending speed of the cages or cars in case of an accidental breaking of the hoisting rope or ropes.

The main objects of my invention are to produce a cheap, simple, and effective mechanism that may be located in the framework or superstructure of the elevator-shaft, the same being adapted to be immediately thrown automatically into active operation upon the breaking of a hoisting-rope and when so liberated to positively and surely secure the elevator cages or cars against unduly rapid descent, thereby saving life and preventing destruction to the elevator cages or cars and their attendant mechanism.

Other objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a general view of an elevator mechanism embodying my invention. Fig. 2 is a detail of the upper works or superstructure, showing my safety appliance. Fig. 3 is a detail of the safety-hook that may be employed and which will throw the safety device into operation when the elevator car or cage has ascended too high.

Like numerals of reference indicate like parts in all the figures of the drawings.

1 designates the usual superstructure or framework, located at the upper end or above the well, and 2 the usual vertical guides, in which run the cages or cars 3.

Upon suitable transverse shafts 4 4, journaled or otherwise mounted in the superstructure, are located overhead pulleys 5, the shaft being in alinement and the pulleys preferably of the twin style. Over the outer grooves of these pulleys runs the usual hoisting-rope 6, the same passing down and around the usual winding-drum. (Not shown.)

Extending inwardly from suitably-located bearings adjacent to the superstructure or framework is a vertically-movable lever 7, the same having journaled at its front end, which preferably occurs between and below the double-faced pulleys 5 5, a loose pulley 8, the said lever between its ends being weighted, as at 9, or otherwise normally depressed. A secondary or safety rope or cable 10 passes under this pulley 8, over the inner grooves of the two pulleys 5 5, and has its opposite ends connected to the cages or cars 3.

Immediately above or at any other convenient point adjacent to the loose pulley 8 is located and secured in any manner a stationary brake-shoe 11, with which the loose pulley is normally out of contact by reason of the weight 9 constantly depressing the lever 7, upon which said pulley is mounted.

It will at once be obvious that if at any time the elevator-rope should accidentally break instead of the cars or cages falling to the bottom of the shafts, and thus killing or injuring their occupants, as well as causing great damage to the elevator mechanism, the cages or cars will become suspended by the safety-rope 10, and the weight of the elevator cages or cars exceeding that of the weight 9 the lever 7 will be drawn up, so that its loose pulley 8 will be brought forcibly into contact with the brake-shoe 11, such contact being maintained as long as the lever is influenced by the weight of the elevator-cars, so that the latter will be either securely held at that point within the well or, if one be heavily weighted, will gradually and slowly lower until it reaches the bottom of the well.

If preferred, I may provide means for actuating the described safety devices whenever the elevator cars or cages ascend beyond their normal position and one which would endanger the superstructure and the mechanism carried thereby. To accomplish this end, I employ what I term a "safety-hook," more particularly illustrated in Fig. 3. This hook is intended to connect the car or cage with the usual hoisting-rope, or, in other words, is

an intermediary device, and it consists of a shank 12, attached to the car or cage, and a hook 13, pivoted to the shank, as at 14, and normally held in a locked or operative position alongside the shank by means of a slip-ring 15. A coiled spring encircles the shank 12 between the elevator and the slip-ring and serves as a stop for the latter to prevent it from slipping down to a position where it will not secure the hook down upon the shank, as shown. The hoisting-rope is attached to the aforesaid hook by means of a ring or loop 17, so that it can readily disengage itself from the hook if at any time the aforesaid slip-ring becomes depressed upon the shank sufficiently far to liberate the hook. In order to cause such a depression of the ring and consequent liberation of the hook at a time when the elevator ascends to the danger-point, I may support a trip-eye 18 at the lower end of the superstructure or framework by means of a cross-piece 19, the elevator-rope running through the eye 18. Of course any other tripping device may be substituted for the eye, the object being merely to depress the slip-ring of the hook when the elevator ascends to the danger-point. It is obvious that such a depression of the slip-ring will cause the safety devices to operate the same as if the elevator-rope had become broken.

In Fig. 4 I have illustrated another form of my invention wherein I employ a series of brakes, one for each of the pulleys 5 5 and 8. In this latter construction is employed a rocking frame 16, which is supported on a transverse rock-shaft 17, the sides of the frame being arranged under the pulleys 5 5 and the ends of the said sides occurring over the pulley 8. The sides of the frame are connected by a brake-shoe 11, and similar brake-shoes 11 are supported by each of the sides of the frame.

In operation the breaking of the rope 6 causes the rope 10 to support the elevator-cage, and the weight of the latter draws up the weighted pulley 8, as in the former construction. The pulley 8, moving upward, contacts with the central brake-shoe 11, raising the latter and the frame 16 until the brake-shoes 11 carried thereby are brought into contact with the under sides of pulleys 5 5, the result of the operation being the same as before.

Having thus fully described my invention, what I claim is--

1. The combination with the elevator-cars, overhead pulleys, and the hoisting-rope passing over the pulleys and connected to the cars, of a lever carrying a weight and fulcrumed adjacent to the pulleys, a loose pulley carried by the lever, a brake-shoe arranged adjacent to the loose pulley, and a safety rope or cable also passed over said pulleys and connected to the said cars and passed under the aforesaid loose pulley.

2. The combination with the elevator-cars, the overhead pulleys, and the hoisting-rope passed over the same and connected to said cars, of a lever, a weight carried thereby, a loose pulley carried by the lever, a fixed brake-shoe located above and in the path of the said loose pulley, intermediate pulleys, and a safety-rope passed under the loose pulley, over the intermediate pulleys and connected to the said cars.

3. The combination with an elevator-car and safety devices adapted to support the car upon the separation of the hoisting-rope, of a shank secured to the car, a hook pivoted to the shank, a slip-ring embracing the hook and shank, a spring upon the shank adapted to serve as a stop for the ring, a hoisting-rope connected to the hook, and a trip located in the path of said ring.

4. The combination with an elevator-car, and safety devices adapted to support the car upon the separation of the hoisting-rope, of a shank secured to the car, a hook pivoted to the shank, a slip-ring embracing the hook and shank, a spring on the shank adapted to serve as a stop for the slip-ring, a hoisting-rope connected to the hook, and a trip-ring located in the path of the slip-ring and receiving the hoisting-rope.

5. The combination with the elevator-cars, the overhead double-faced pulleys, and the hoisting-rope passed over said pulleys, of a weighted lever fulcrumed adjacent to the pulleys, a loose pulley journaled on the lever, a safety-rope also passed over said pulleys and under the loose pulley and connected to the elevator-cars, a shank connected to the car, a hook pivoted to the shank, a slip-ring for connecting the hook and shank, a spring adapted to serve as a stop for the slip-ring, and a trip device arranged in the path of the said ring.

6. The combination with the elevator-car, overhead pulleys, and the hoisting-rope passing over the pulleys and connected to the car, of a frame mounted to rock under the pulleys and provided with brake-shoes adapted to contact therewith when the frame is elevated, a brake-shoe at the end of the frame, a lever, a weight for the same, a pulley journaled in the free end of the lever and located below and in line with the brake-shoe at the end of the frame, and a safety rope or cable passing under the pulley of the lever and over the loose pulleys and connected at its ends to the car.

In testimony whereof I affix my signature in the presence of two witnesses.

AUGUST IHLENFELDT.

Witnesses:
LOUIS IHLENFELDT,
PETER NISIUS.