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J. OWENS.

SAFETY BRAKE MECHANISM FOR MINE CAGES AND SKIPS.

APPLICATION FILED JAN. 29, 1907.

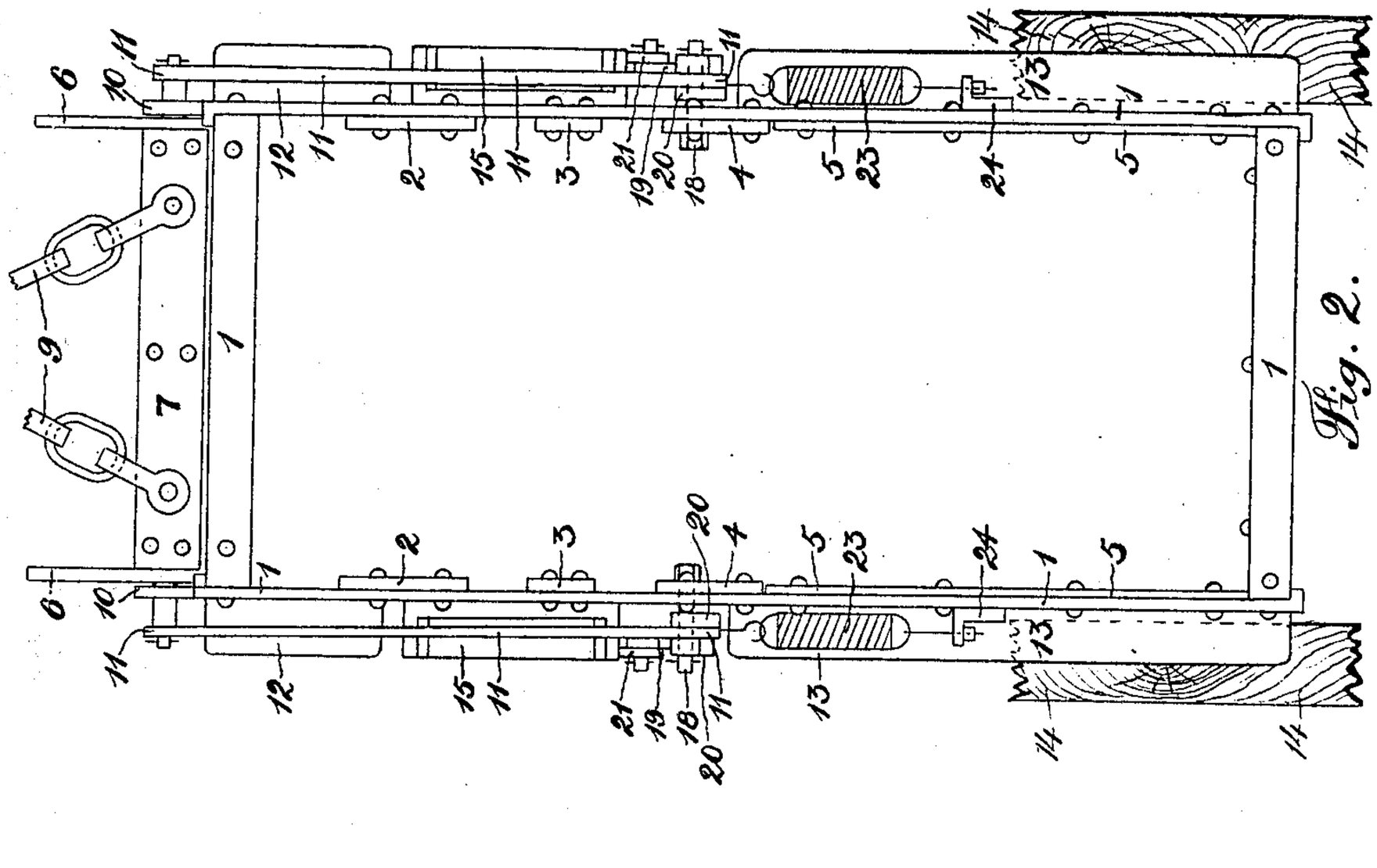

Fig. 2.

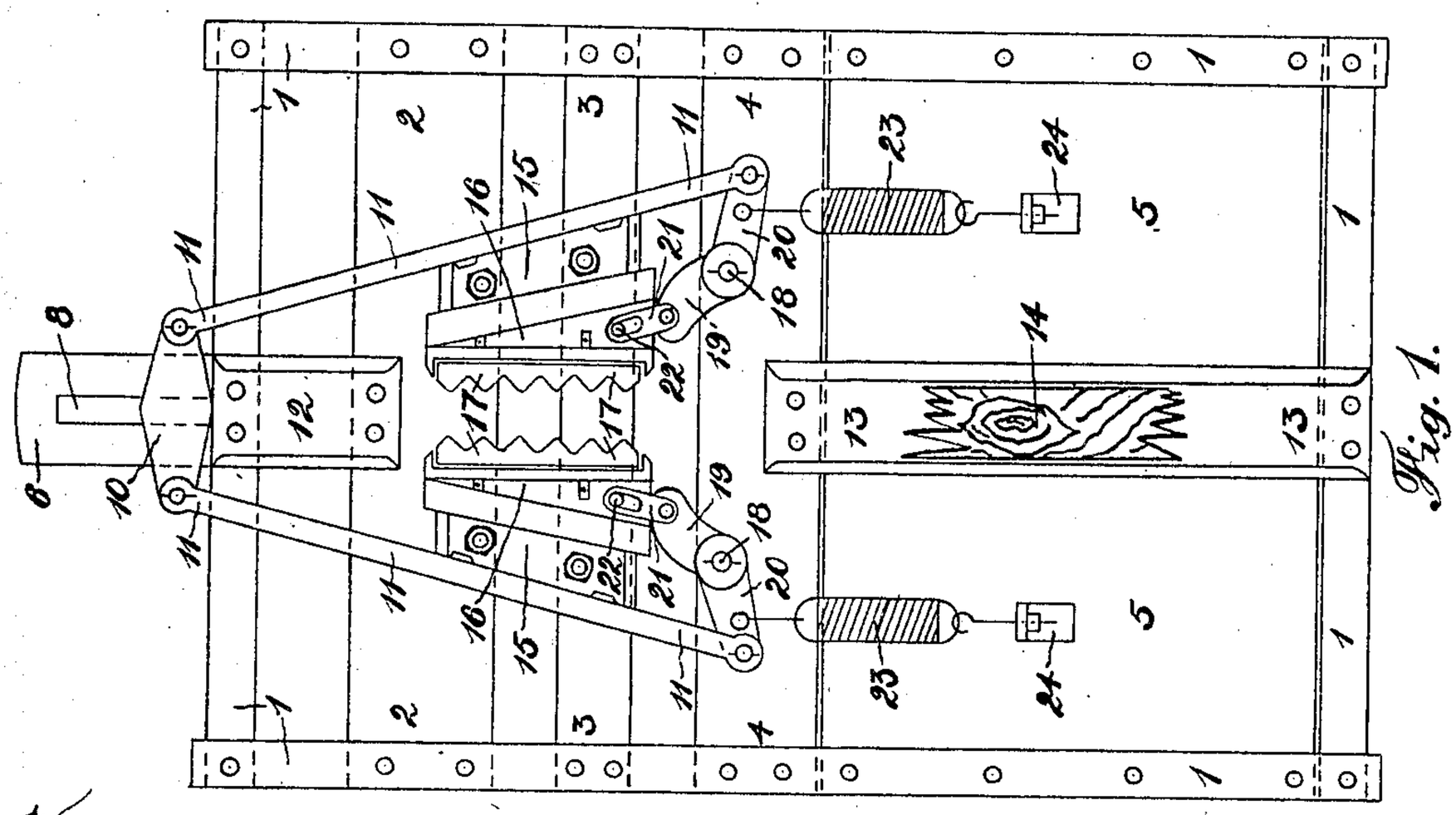

Fig. 1.

Witnesses:
R. Ovendale
F. Ovendale

Inventor:
John Owens
by Chas. Ovendale
Attorney

UNITED STATES PATENT OFFICE.

JOHN OWENS, OF MARAISBURG, TRANSVAAL.

SAFETY BRAKE MECHANISM FOR MINE CAGES AND SKIPS.

No. 870,989. Specification of Letters Patent. Patented Nov. 12, 1907.

Application filed January 29, 1907. Serial No. 354,731.

To all whom it may concern:

Be it known that I, JOHN OWENS, a subject of the King of Great Britain, and resident of Maraisburg, Transvaal, have invented certain new and useful Improvements in Safety Brake Mechanism for Mine Cages, Skips, and the Like, of which the following is a specification.

This invention relates to safety brake mechanism primarily designed for mine cages. It is also applicable for use with hoists, lifts, elevators or the like in which the car or vehicle is guided between runners or guides.

The invention will be described in detail by aid of the accompanying drawing, in which

Figure 1 represents a side elevation of a mine cage with my invention applied thereto, and Fig. 2 is an elevation at right angles to Fig. 1.

1 indicates the members which constitute the frame of the cage. These may be of any desired section.

2, 3 and 4 indicate plates riveted or otherwise suitably fixed to the frame 1 at opposite sides of the cage, and 5 are plates inclosing the sides of the cage in its lower portion.

6 indicates two brackets or plates which form guides for the draw or cross bar 7. The extremities of the crossbar 7 work in the vertical slots 8 provided in the guides 6.

9 indicates chains forming the connection between the drawbar 7 and the hauling or winding rope, not shown. On the extremities of the drawbar 7 beyond the guides 6 are fixed plates 10. These latter plates 10 have pivotally attached to each extremity a rod 11.

12, 13 indicate ordinary shoes riveted to the frame 1 and plates 2, 4, which shoes traverse the runners 14 to guide the cage in its ascent and descent of the shaft.

To the plates 2, 3, at each side of the runner 14 and in the space provided between the top shoes 12 and the bottom shoes 13, are bolted guides 15 which are inwardly inclined on the inside from the bottom to the top.

16 are brake blocks which on the one side are inclined from the top to the bottom to correspond to the guides 15 against which they fit. The other and vertical faces of the brake blocks are constructed to receive detachable serrated or toothed plates or gripping pieces 17, the serrated faces of which are adapted to come into contact with and to grip the sides of the runners 14 when the safety gear comes into operation owing to the breakage of the hauling rope or otherwise.

By constructing the serrated pieces or plates 17 detachable from the wedge shaped blocks 16, they may be changed or renewed when necessary without necessitating the renewal of the whole of the brake blocks. It will be understood that when the brake blocks 16 are moved upwards in their guides 15, the serrated faces of the plates 17 move towards each other and so contact with the sides of the runners 14 and apply the braking action to the vehicle to arrest its downward movement.

On bolts 18 fixed to the plates 4 are revolubly mounted eccentrics 19 which are formed in one piece with or rigidly connected to levers 20. The eccentrics 19 are adapted to contact with the underside of the wedge shaped brake blocks 16 to raise them in their guides 15 to bring the serrated faces into contact with the runners 14. The rods 11 are pivotally connected at their lower extremities to the outer extremities of the levers 20. To the eccentrics 19 are pivoted links 21. These links 21 are each constructed with an elongated slot engaging a pin or projection 22 on the side of the wedge shaped brakeblocks 16. These links 21 serve for drawing down the brakeblocks 16 in their guides 15 to throw the serrated or toothed surfaces 17 clear of the sides of the runners 14 in the normal running of the cage. They also operate to pull the brakeblocks 16 over any bad joint in the runners.

23 indicates springs which are connected at one end to the levers 20 and at the other to brackets 24 fixed to the side of the cage. These springs 23 serve for accelerating the motion of the catch gear in the event of the rope breaking.

In the normal running of the cage in the shaft, the draw or crossbar 7 takes up a position in the top of the slots 8 in the guides 6. This raises the rods 11, which lift the levers 20 and rotate the eccentrics 19, and through the medium of the links 21 draw the brakeblocks 16 down in their guides 15 and clear of the runners 14. With the parts in these positions the springs 23 are in tension. In the event of the rope or suspension gear breaking then the weight of the drawbar 7 and its attachments, through the rods 11, and aided by the springs 23, draw down the levers 20, raise the eccentrics 19, which latter lift the brakeblocks 16 in their guides 15 and cause the serrated gripping pieces 17 to come into contact with the sides of the runners 14 and so arrest the movement of the cage.

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

1. In a safety brake mechanism of the nature indicated, the combination with the vehicle and runners of inclined guides fixed to the vehicle at the sides of the runners, a pair of serrated wedge shaped brake blocks arranged in said guides and movable therein towards and away from the runners, an eccentric for each brake block revolubly carried by the vehicle and adapted to engage the underside of the brake blocks to raise them into contact with the runners, links pivoted to the eccentrics, each formed with an elongated slot, a pin fixed to each brake block which engages one of said elongated slots, a lever connected to each eccentric, and connections between said levers and the winding rope for depressing the eccentrics when the weight of the cage is on the rope to cause the brake blocks to run clear of the runners.

2. In a safety brake mechanism of the nature specified, the combination with the vehicle of inclined guides fixed to the vehicle and runners at the sides of the runners, a pair of serrated wedge shaped brake blocks arranged in said guides and movable therein towards and away from the runners, an eccentric for each brake block revolubly carried by the vehicle and adapted to engage the underside of the brake blocks to raise them into contact with the runners, links pivoted to the eccentrics, each formed with an elongated slot, a pin fixed to each brake block which engages one of said elongated slots, a lever connected to each eccentric, connections between said levers and the winding rope for depressing the eccentrics when the weight of the cage is on the rope to cause the brake blocks to run clear of the runners, and springs connected with the levers for accelerating the motion of the levers and eccentrics in the event of breakage of the winding rope.

3. In a safety brake mechanism of the nature indicated, in combination, the vehicle, the runners 14 the drawbar 7 connected with the winding rope, the guides 6 for the drawbar, the rods 11 connected to each end of the drawbar, the inclined brake block guides 15, the wedge shaped brake blocks 16 and the serrated plates 17 detachably fixed to the brake blocks 16, the eccentrics 19 revolubly carried by the vehicle and adapted to engage the underside of the brake blocks, the links 21 pivoted at one extremity to the eccentrics 19 and at the other extremity constructed with a slot, the pins 22 fixed to the brake blocks 16 and engaging the slots in the links 21, the levers 20 connected to and actuating the eccentrics 19 and having fixed to their outer extremities the rods 11 for raising the levers and lowering the eccentrics and brake blocks when the weight of the vehicle is on the winding rope, the springs 23 connected to the levers 20, and the brackets 24 to which the other extremities of the springs are fixed.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHN OWENS.

Witnesses:
CHAS. OVENDALE,
R. OVENDALE.