

No. 647,241.

Patented Apr. 10, 1900.

F. J. SPRAGUE.

BRAKE FOR HOISTING MECHANISM.

(Application filed Sept. 20, 1899.)

(No Model.)

Fig. 1.

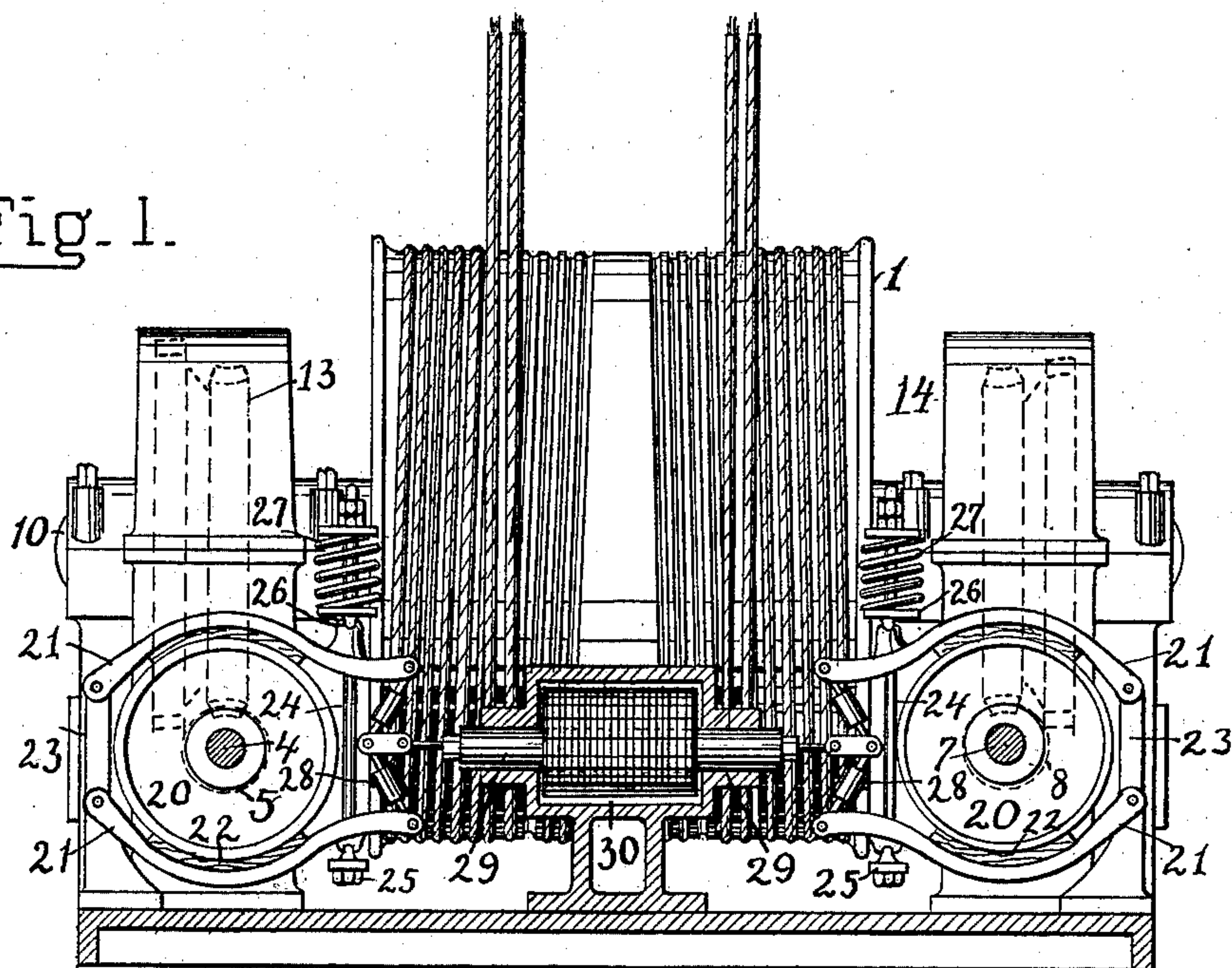
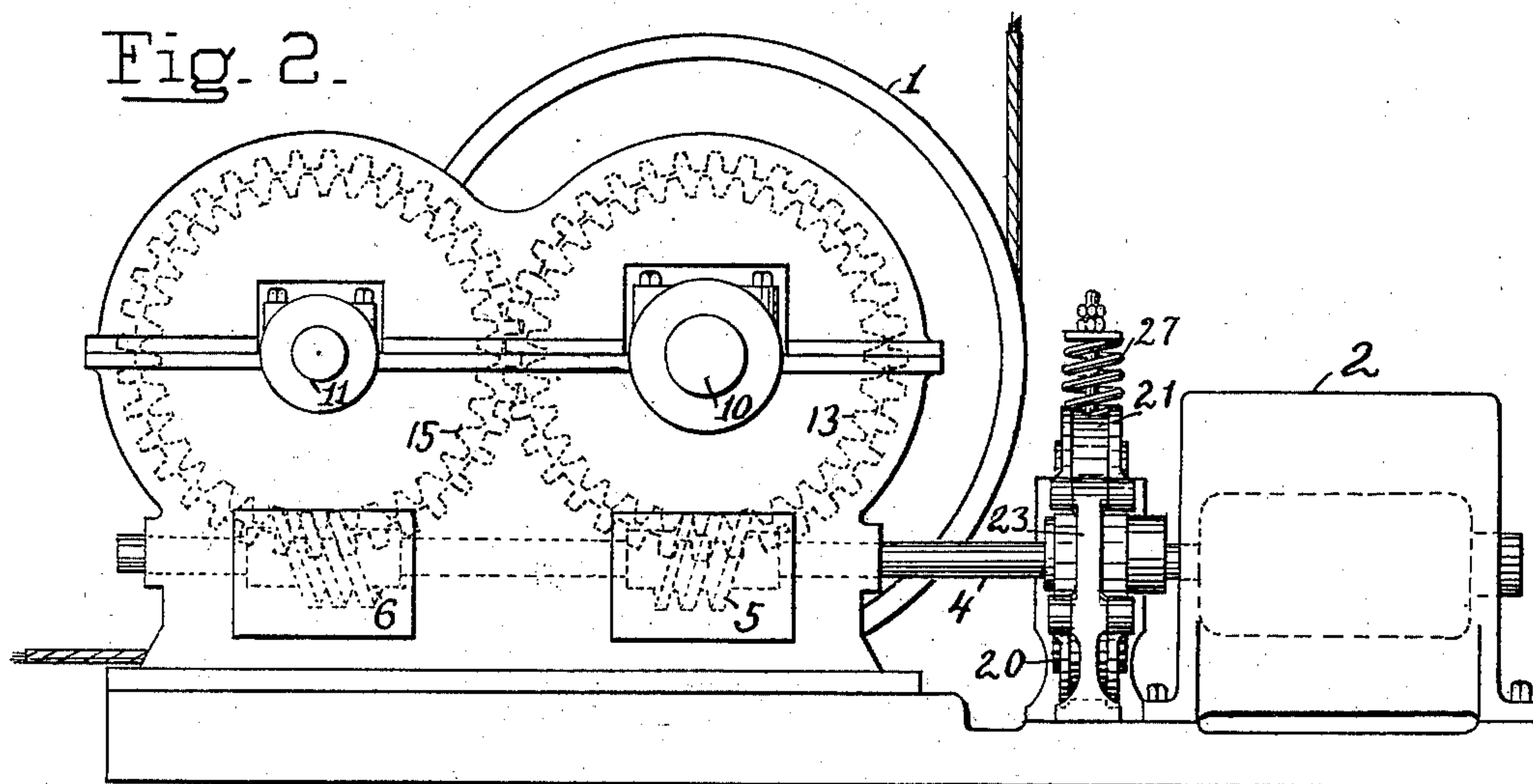


Fig. 2.



Witnesses:

*Samuel W. Balch*  
*Hyatt Whitman*

Inventor,

*Frank J. Sprague*

*By Thomas Ewing Jr*  
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# UNITED STATES PATENT OFFICE.

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## BRAKE FOR HOISTING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 647,241, dated April 10, 1900.

Original application filed July 27, 1898, Serial No. 687,009. Divided and this application filed September 20, 1899. Serial No. 731,103. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK J. SPRAGUE, a citizen of the United States of America, and a resident of the borough of Manhattan, in the city, county, and State of New York, have invented certain new and useful Improvements in Brakes for Hoisting Mechanism, (for which I have obtained a patent in Great Britain on an application filed December 31, 1897, No. 30,923, and sealed March 7, 1899, and a patent in France on an application filed March 3, 1898, and issued June 13, 1898, No. 275,549,) of which the following is a specification.

This application is filed as a division of application for Letters Patent of the United States filed July 27, 1898, Serial No. 687,009, for improvements in elevators.

These improvements relate particularly to an arrangement of brakes for a hoisting mechanism in which there are two driving-shafts, to which the brakes are simultaneously applied and released through suitable brake applying and releasing mechanism controlled from a single solenoid-magnet.

In the accompanying sheet of drawings, which forms a part of this specification, Figure 1 is an elevation of the end of a hoisting-machine with the brake mechanism arranged in accordance with my invention, the base of the machine and the frame with the solenoid-magnets being in section and the motors being removed. Fig. 2 is a side elevation of the hoisting-machine, showing one of the motors and the brake-wheel and brakes.

In its general features the hoisting mechanism consists of a winding-drum 1, suitably mounted and driven through the agency of positive gearing, consisting of worm-gearing and spur-gearing, by two electric motors, the motor 2 being shown in Fig. 2. There are two driving mechanisms, one located at each side of the hoisting-machine, with the winding-drum between them. The driving-shafts 4 and 7 of both driving mechanisms and motors appear in section in Fig. 1, and one of the driving mechanisms is shown in Fig. 2 in dotted lines. On the shaft 4 is a left-hand worm 5, which engages the left-hand worm-wheel 13, and on the shaft 7 is a right-hand

worm 8, which engages the right-hand worm-wheel 14. The two worm-wheels are mounted on a drum-shaft 10. A gear-shaft 11, with worm-wheels meshing with worms of opposite hands on the driving-shafts to the other worms on the driving-shafts, may be added to balance the end thrusts of the worms, as set forth in my original patent application above named.

On each worm-shaft is a brake-wheel 20, and adjoining each brake-wheel is a pair of brake-levers 21, which carry suitable brake-shoes 22. The brake-levers are fulcrumed to standards 23, which are bolted to the bed-plate of the machine. Near the opposite ends of each pair of levers are holes through which a brake-applying rod 24 is loosely passed. A head 25 at the lower end of the rod bears against the lower brake-lever, and a washer 26 bears against the upper brake-lever. The head of the rod and the washer are each so shaped in conjunction with the brake-lever against which it bears that each can rock slightly. A brake-applying spring 27 lies between the washer against the upper brake-lever and a washer which lies under nuts at the upper end of the brake-applying rod. The spring, which is compressed between the two washers, draws the ends of the brake-levers together and applies the brake-shoes to the brake-wheel. Toggles 28 are attached to the ends of the brake-levers, and these when straightened separate the brake-levers and hold off the brake-shoes. The movement of the lower brake-lever is limited by the contact of the head of the brake-applying rod with the bed-plate of the machine, and this movement is only half the spreading action of the toggles, so that the spreading action will also operate the upper brake-lever; but for this contact only the lower brake-lever would operate, since the weight of the upper brake-lever would keep its brake-shoe always in contact with the brake-wheel. The links of each set of toggles are connected to a soft-iron plunger 29, and the two plungers operate in opposite ends of the solenoid 30. This solenoid when energized attracts both plungers and simultaneously releases the brakes

from both worm-shafts. When the circuit through the coil is broken, the attraction of the plungers ceases and the springs simultaneously apply the brakes to both worm-shafts.

5 What I claim as new, and desire to secure by Letters Patent of the United States, is—

In a hoisting mechanism, the combination of two driving-shafts, brake-wheels on each driving-shaft, two brake-levers for each brake-  
10 wheel, a brake-applying rod and a brake-applying spring connected with each pair of

brake-levers to draw them together, toggles to separate the brake-levers, a solenoid, and plungers operating in opposite ends of the solenoid and connected to the toggles, substantially as described. 15

Signed by me in New York city, New York, this 13th day of July, 1899.

FRANK J. SPRAGUE.

Witnesses:

SAMUEL W. BALCH,  
HUGH PATTISON.