

(No Model.)

C. H. W. REICHEL.

DIFFERENTIAL PULLEY AND CORD HOISTING GEARING.

No. 396,430.

Patented Jan. 22, 1889.

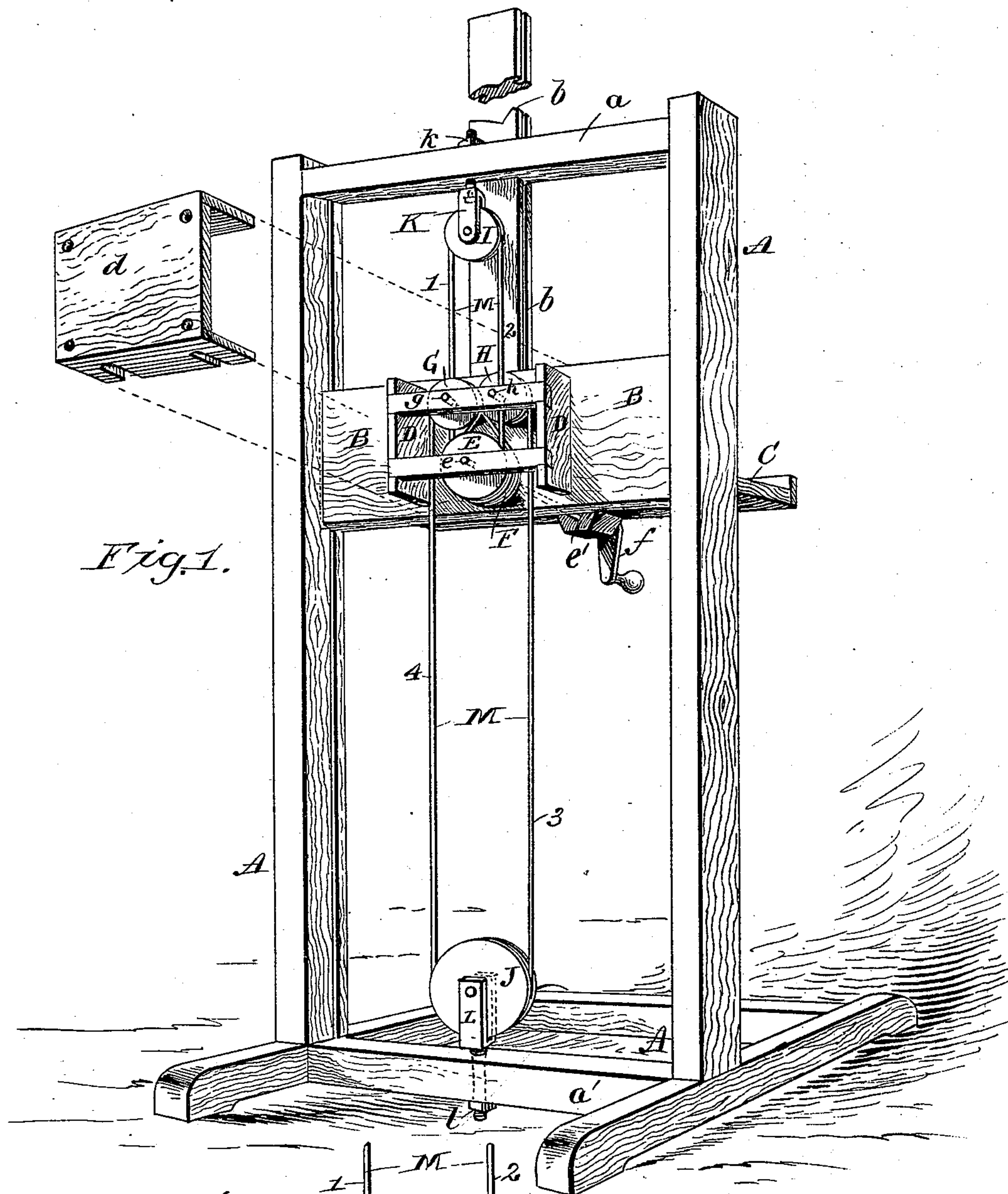


Fig. 1.

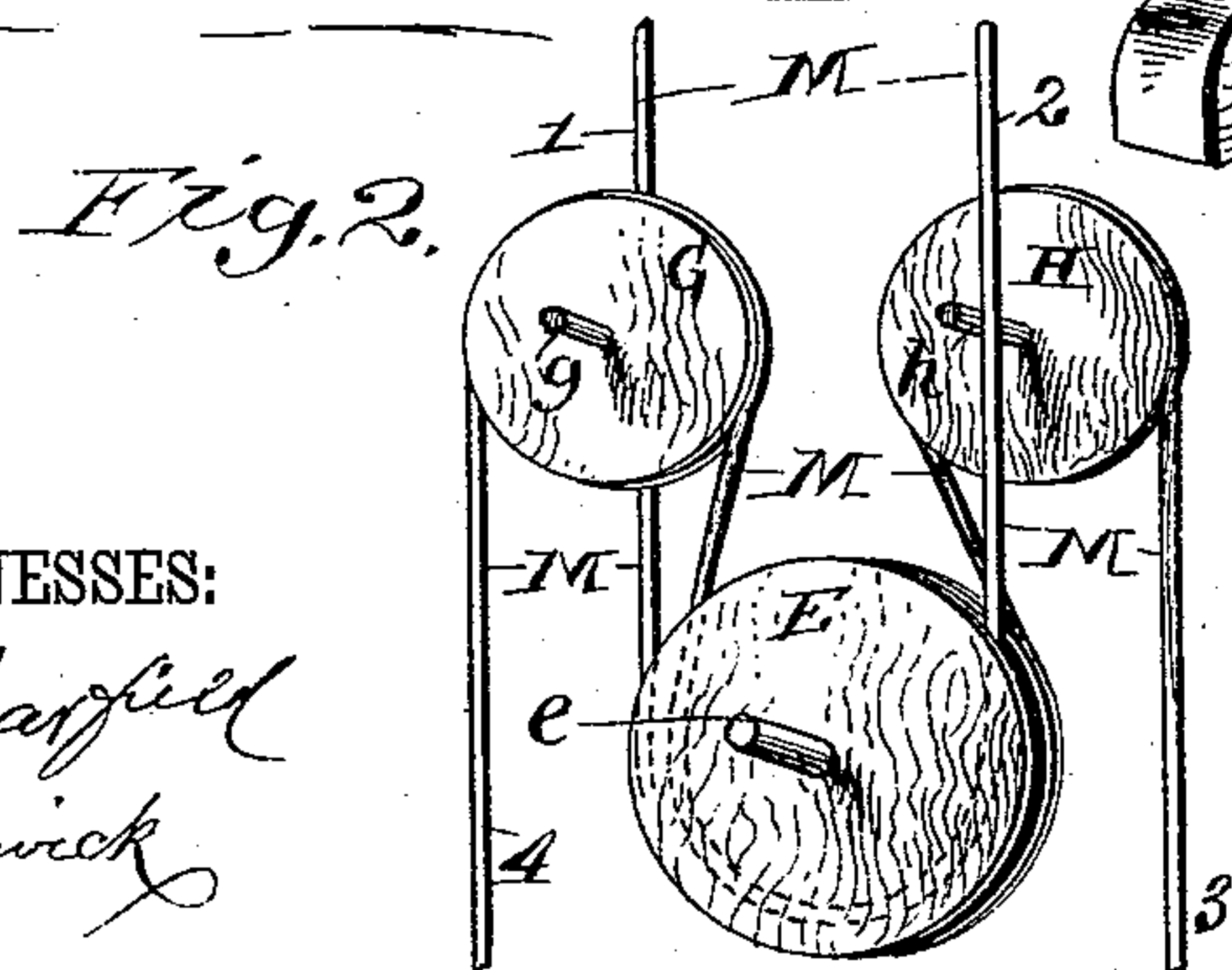


Fig. 2.

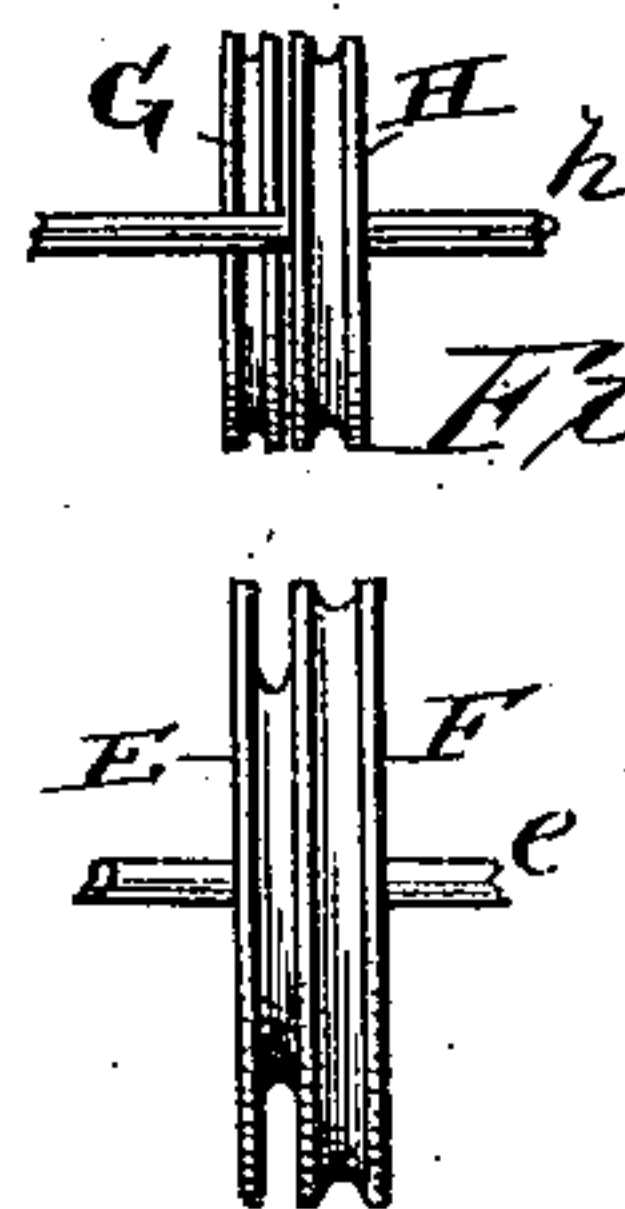


Fig. 3.

WITNESSES:

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DIFFERENTIAL PULLEY-AND-CORD HOISTING-GEARING.

SPECIFICATION forming part of Letters Patent No. 396,430, dated January 22, 1889.

Application filed June 22, 1888. Serial No. 277,883. (No model.)

To all whom it may concern:

Be it known that I, CARL HEINRICH WILHELM REICHEL, of the city, county, and State of New York, have invented a new and Improved Differential Pulley-and-Cord Hoisting-Gearing, of which the following is a full, clear, and exact description.

My invention has for its object to provide a simple, inexpensive, and efficient differential pulley-and-cord gearing for hoisting or drawing or pulling purposes, more particularly adapted for adjusting the picture or color tray of an artist's easel, but applicable to a wide range of useful work in connection with other mechanisms or structures.

The invention consists in certain novel features of construction of the differential gearing, all as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view of a differential gearing made in accordance with my invention and applied to raising and lowering the tray of an artist's easel, the cap of the main pulley-box being removed therefrom and shown at one side. Fig. 2 is a perspective view of the four main pulleys of the gearing and portions of the cord rove over them, the pulleys being separated somewhat more than in actual use the better to show the manner of adjusting the cord to them; and Fig. 3 is an edge view of these four pulleys, taken at right angles to the same parts in Fig. 2.

The differential hoisting-gearing in the preferred arrangement consists of six pulleys, which are journaled to fixed and movable parts of a structure, and an endless cord or chain rove through the pulleys in a peculiar manner, as presently described.

The drawings represent the differential gearing applied to an ordinary artist's easel for raising or lowering the picture or color holding tray thereof and is an example of one useful application of my invention; but many other applications of it may be made to other structures with advantage. I will, however, particularly describe the invention as applied to the artist's easel, and as follows:

The easel-frame A is provided at opposite sides with guide-slots, in which is fitted for vertical movement the cross-head B, to which the tray C is fixed. At its back or rear face the movable cross-head is provided with a suitable box or casing, D, in which the main operating parts of the differential gearing are placed, and this box or casing is preferably provided with a cap or cover, *d*, which is shown removed to one side in Fig. 1 of the drawings. The cross-head B is provided with the usual upright, *b*, which is fitted to slide in the top cross-bar, *a*, of the easel-frame. In the box or casing D and the cross-head B are journaled three shafts, *e g h*. The shaft *e* carries two pulleys or sheaves, E F, which have grooved peripheries of different diameters. These pulleys are shown made in one piece or block; but they may be made separate from each other and may be secured to the shaft *e* in any approved way. The shaft *g* carries a pulley, G, and the shaft *h* is provided with a pulley, H. The other two pulleys, I J, are journaled, respectively, in forked clips or shackles K L, which are held to the top and bottom cross-bars, *a a'*, of the easel-frame by bolts and nuts, allowing the endless belt or cord M, which is rove through the pulleys, to be stretched tightly at any time by turning up the nuts *k l* of the clip-holding bolts. The pulleys G H are preferably set in different planes and ordinarily will overlap each other somewhat, as shown in Fig. 1 of the drawings. The shaft *e* of the differential pulleys E F is prolonged forward and has a bearing in a lug or box, *e'*, fixed to the under side of the easel-tray, and at its forward end the shaft carries a crank, *f*, by turning which the tray may be raised or lowered, as presently explained.

The endless cord, rope, or chain M is rove through the pulley-gearing in the following manner: The right-hand side of the upper part of the cord, as seen in Fig. 1 of the drawings, is passed downward to and under the smaller differential pulley, E, and thence upward to and over the pulley G, and thence downward to and under the lower pulley, J, and thence upward to and over the pulley H, thence downward to and beneath the larger differential pulley, F, and thence upward to and over the top pulley, I, and downward therefrom to

the pulley E. Thus arranged the two opposite upper portions, 1 2, of the endless belt above the pulley box or casing D will travel in opposite directions, and the two opposite lower portions, 3 4, of the belt will also travel in opposite directions; but the parts 2 3 and 1 4 will always move up and down in reverse directions—that is to say, while the part 1 is moving upward the part 4, at the same side of the belt, will move downward, and vice versa, and while the part 2 is moving downward the part 3 will move upward, and vice versa.

With this construction it is obvious that when the crank *f* of the pulley-shaft *e* is turned in one direction the tray C of the easel will be raised, and as the crank is turned in the opposite direction the tray will be lowered, and the upward and downward movements of the tray will be at a speed depending on the difference in diameters of the pulleys E F. The greater this difference is the faster will be the movement of the tray, and the smaller is this difference in diameters of the pulleys the slower will the tray move; hence any desired speed of the moving part or parts carrying the differential pulleys E F and the cord-guiding or idler pulleys G H may be secured by giving the necessary proportions or differentiation in diameters to the pulleys E F, as will readily be understood.

As hereinbefore intimated, this differential pulley-and-cord hoisting-gearing may be applied to hoisting and lowering or drawing apparatus of various kinds for performing useful work, and either by vertical or horizontal

movements, without departing from the principles of operation of the invention, the example herein given for purposes of explanation being but one of many possible applications of the invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, in differential hoisting or drawing gearing, of two pulleys of different diameters held by one shaft to the part or structure to be moved, an endless cord, idler pulleys or guides allowing the cord to be passed under both the differential pulleys, upper and lower pulleys or guides for the cord held to a relatively-fixed frame or support, and said endless cord rove beneath the differential pulleys and over the idler pulleys or guides on the movable part or structure, and also rove around or over the pulleys or guides on the relatively-fixed frame or structure, substantially as herein set forth.

2. The combination, in differential hoisting or drawing gearing, of two differential pulleys, E F, on a shaft, *e*, journaled to a movable part or structure, guide-pulleys G H on said structure, guide-pulleys I J on a relatively stationary frame or support, and an endless cord, M, passed beneath the pulleys E F and over the pulleys G H and around or over the pulleys I J, substantially as herein set forth.

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Witnesses:

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