Feb. 12, 1952 S. FAURE 2,585,101

HAULING AND HOISTING GEAR

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Fig. 4

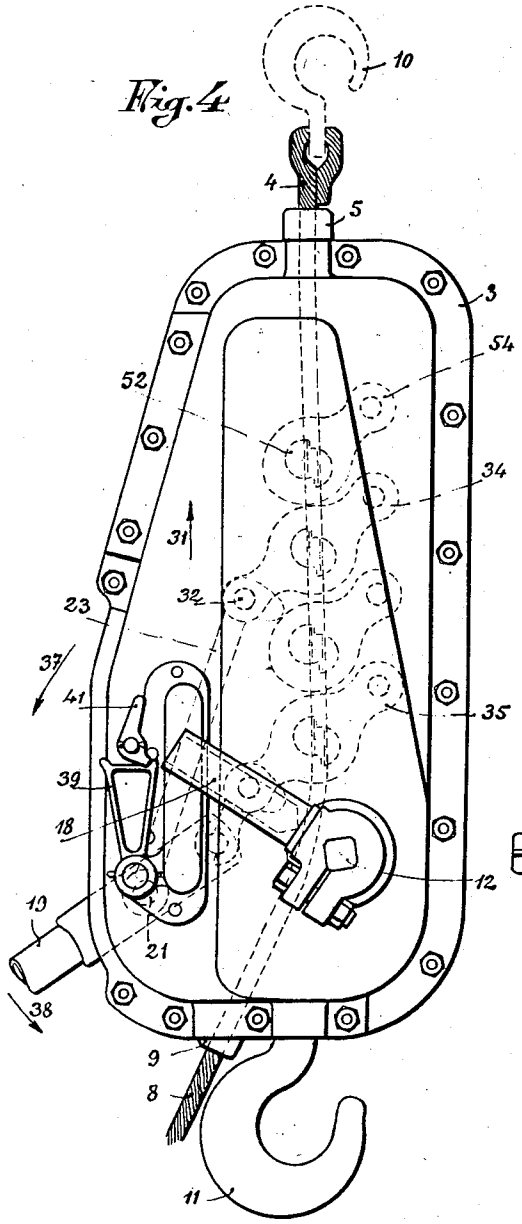
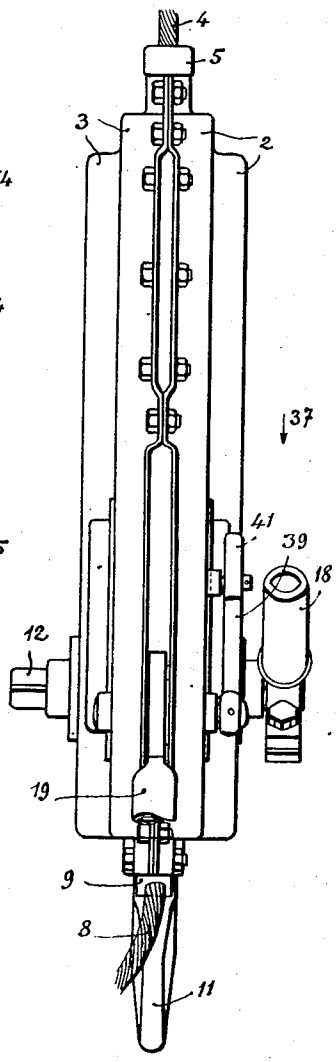


Fig. 1



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Fig. 2

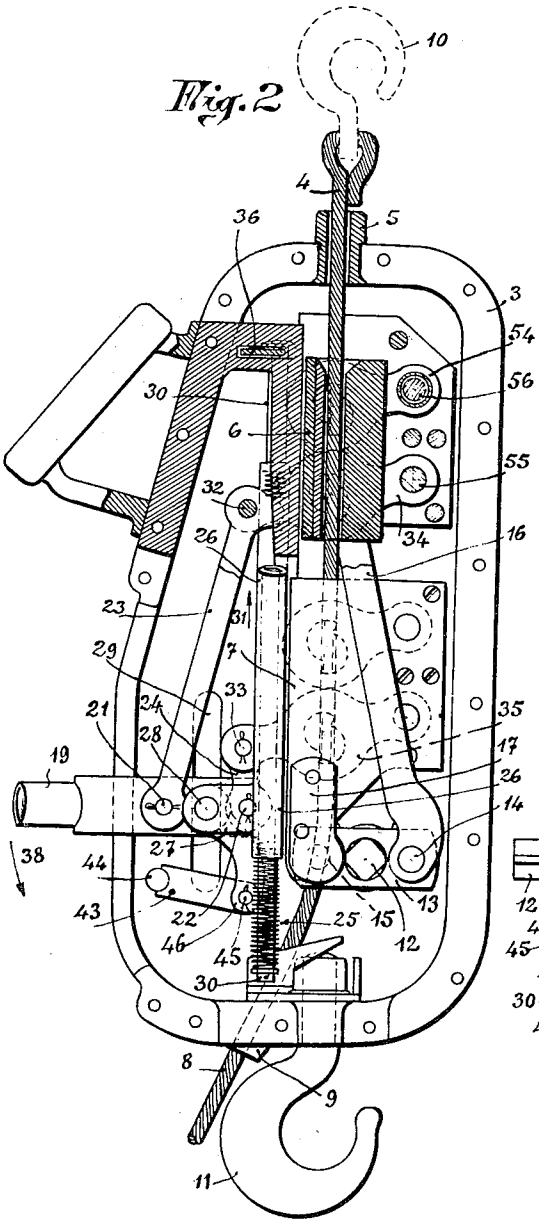
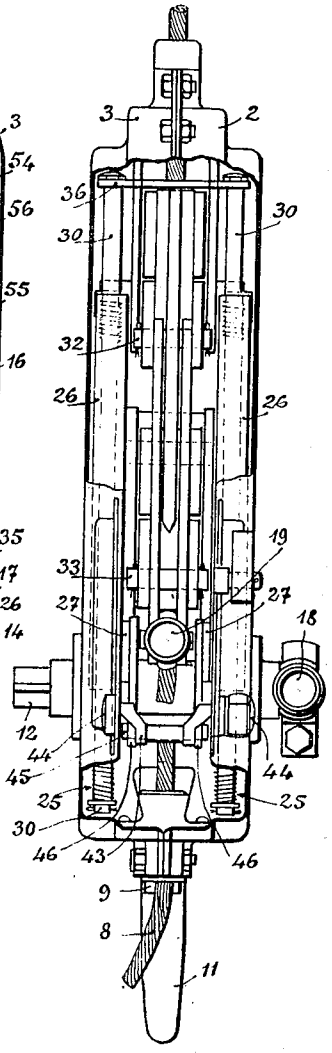


Fig. 3



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Fig. 5

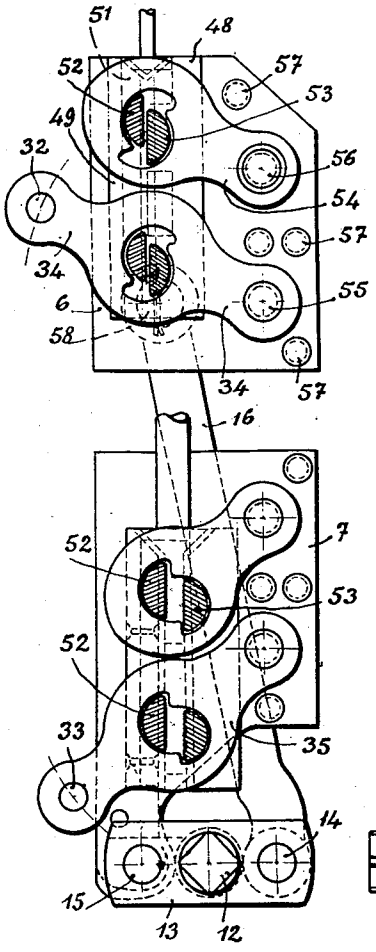


Fig. 6

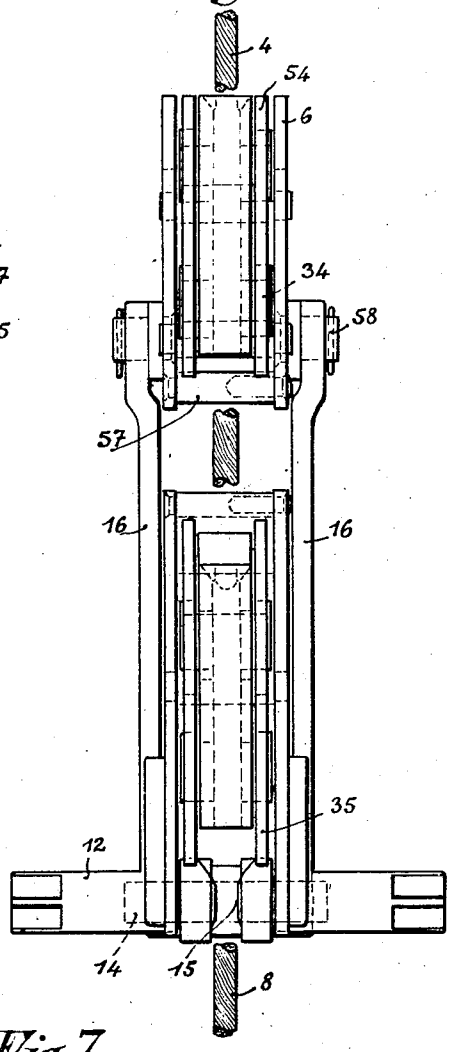
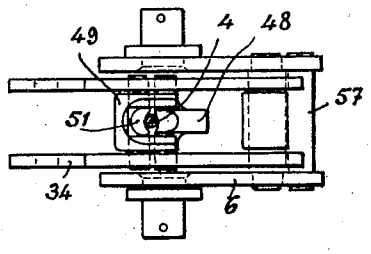


Fig. 7



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Fig. 8

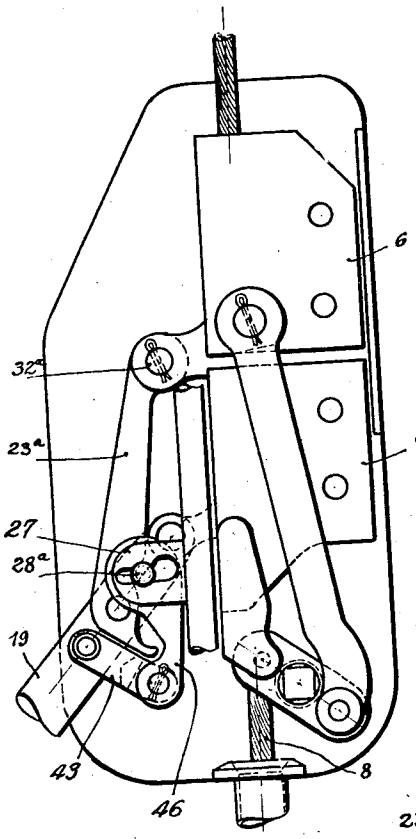
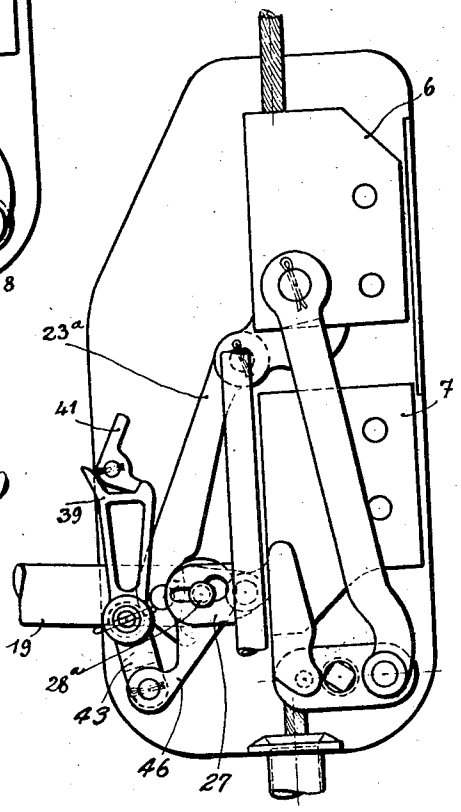


Fig. 10



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Fig. 9

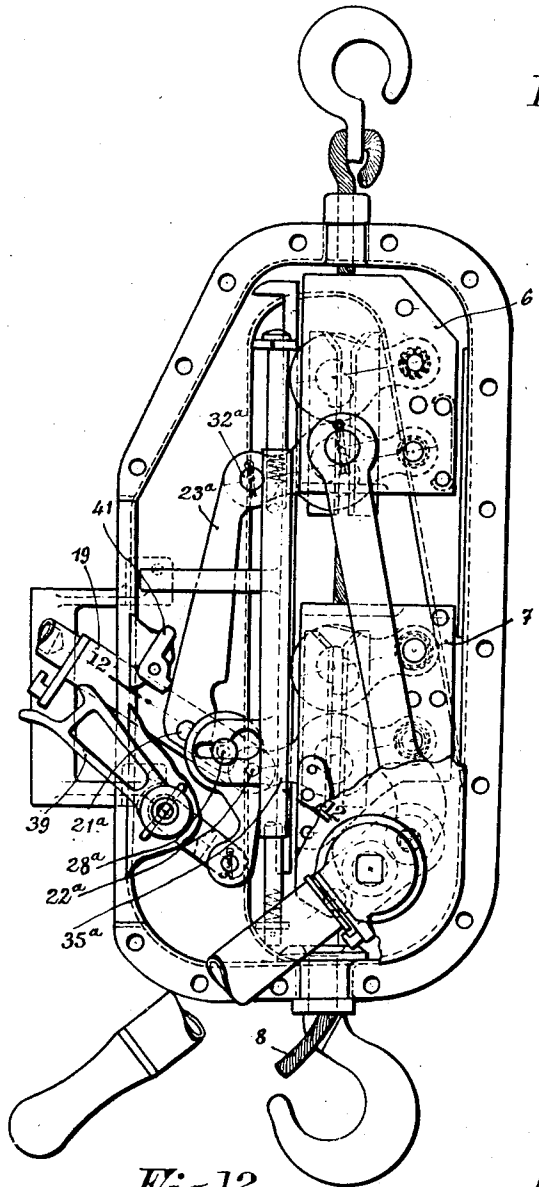


Fig. 11

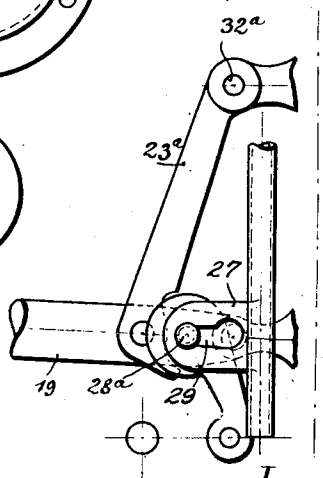
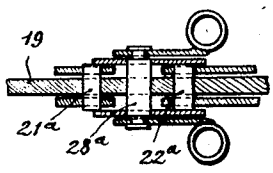


Fig. 12



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2,585,101

HAULING AND HOISTING GEAR

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Application July 10, 1947, Serial No. 759,999
In France September 5, 1945

Section 1, Public Law 690, August 8, 1946
Patent expires September 5, 1965

4 Claims. (Cl. 254—76)

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My invention has for its object a hauling and hoisting gear operating by means of a metal cable, of the type including two blocks adapted to assume simultaneously a longitudinal movement in opposite directions over the cable for taking hold of it and releasing it in turns under the action of control means. Such hauling and hoisting gears generally include a lever controlling the progressive rising of the load through the agency of links connected directly to the cable-engaging jaws in each block so as to provide for the opening of the upper jaw when it moves in a predetermined direction and the opening of the lower jaw when it rises in its turn in the same direction in alternation with the preceding movement of the upper jaw. Now applicant associates this progressive rising movement of the load well known per se with a progressive downward-movement through the association to said first conventional lever of a second lever controlling the jaws in the blocks through the agency of pivoting connections so as to reverse the operation i. e. to open the jaws while the corresponding blocks move in alternation in a direction opposed to the preceding direction.

The accompanying diagrammatic drawing shows, by way of example, one embodiment of the invention:

Figure 1 is a view of the gear in end elevation;

Figure 2 is a side view thereof assuming the case to be open;

Figure 3 is an end view thereof with the case partly removed;

Figure 4 is a side view showing all the jaws in the open position;

Figure 5 is a side view of the coupled jaws alone, the upper jaw being in the closed position, the lower one in the open position; and

Figures 6 and 7 are the same views respectively seen from the end and from the top.

Figs. 8–12 illustrate a modification, Figs. 8 and 10 being side views thereof for two different positions of the control levers and Fig. 9 being a vertical cross section through the arrangement, while Figs. 11 and 12 show details.

The gear (Figure 1) comprises a frame or case which is composed of two stamped parallel plates 2 and 3 and within which its members are enclosed.

The pulling cable 4 penetrates inside the frame through a guide 5 (Figure 2) located at its upper part. It passes between the corresponding jaws carried in the blocks 6 and 7. Its free end 8 passes out of the gear through the cable outlet 9.

In the example illustrated, the hook 10 can be

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attached to a fixed point and the apparatus, which is movable along the cable 4, lifts with it the load fixed to the hook 11. But this gear can be used differently, for example, by attaching the gear by means of its hook 11 to a fixed point and passing the cable 4 over a fixed return pulley located above it. It is then possible to lift a load fixed to the hook 10 located at the end of the side of the cable turned towards the ground.

It is also possible, relatively to the position shown in the drawing, to turn the gear upside-down so that the hook 11 is at the top and the hook 10 at the bottom.

In this latter case, as in the previous one, the gear is attached by means of its hook 11 to any fixed point; when it is operated, it moves the cable 4 relatively to itself and thus lifts the load attached to the hook 10 located at the free end of said cable 4.

During the upward movement, the two movable jaw blocks 6 and 7 are actuated by the shaft 12 on which is mounted the double crank 13 supporting the two crank-pins 14 and 15 to which said blocks are coupled, the jaw block 6 to the crank-pin 14 by means of the connecting rod 16, the jaw block 7 to the crank-pin 15 by means of the connecting rod 17. Said shaft 12, which serves to produce the upward movement, is actuated by means of a lever, not shown, which is inserted in the socket 18 (Figures 1 and 4). The reciprocation of the lever or crank 13 provides alternatingly first when actuated in the direction of the arrow 37 the rising of block 6 through the link or connecting rod 16 and the opening of the jaw against the action of the load while the block 7 remains clamped on the cable, and then the rising of block 7 through the link or connecting rod 15 together with the opening of the jaw therein also against the action of the load while the block 6 remains clamped on the cable. The rising of the block 7 provides thus an upward movement of the gear and of the load.

The downward movement is controlled by a lever, not shown, inserted in the socket 19 which is coupled by the gudgeons 21 and 22 respectively to the connecting rod 23 which actuates the upper jaw in the block 6 and to the connecting rod 24 which actuates the lower jaw in the block 7, respectively through 33 and 34.

Two springs 25 are housed in tubes 26 secured to the parallel parts 27 connected together by the pin 28 which is free to move in the slots 29 provided in the frame or case, the location of the pin being adjusted before operation to prevent its undesired sliding. In the direction of the

arrow 31, they transmit their opposing force to the pivots 32 and 33 which connect the connecting rods 23 and 24 respectively with the levers 34 and 35 controlling the jaws in blocks 6 and 7 respectively.

The jaws in the blocks 6 and 7, which are actuated by said connecting rods 34 and 35 lightly grip the cable 4 during the upward and downward movements.

Two guide-rods 30 (Figures 2 and 3) pass through the inside of the springs 25 of the tubes 26 and are connected together by the cross-member 36 housed in the opening provided for this purpose in the guide for the jaw block 6, fixed on the case 2.

The progressive downward movement is obtained, according to the invention, by actuating in alternating directions the socket or lever 19 round its pivot 28 so as to move the link or connecting rod 23 held between the pivots 21 and 32 and the link or connecting rod 24 similarly pivoting at 22 and 34. The pin 28 for the lever 19 pivots at the point occupied by it in the slots 29 during the upward and the downward movements. By actuating the lever mounted on the socket 19 in the direction of the arrow 38, the jaw in the block 6 is disengaged and brakes the cable 4; the jaw in the block 7 remains engaged with the cable 4 and supports the gear together with the load suspended thereto. If the socket 19 is actuated in a direction opposed to that of the arrow 38, the blocks 6 and 7 move away from one another. The jaw in the block 7 brakes the cable as it moves away from the jaw in the upper block 6.

There is no definite position for stopping the operation during the upward or the downward movement, the load always tends to make the two jaws lock on the gripping position, the two sockets 18 and 19, as they pivot, always having an opposite action to one another.

For the insertion or the removal of the slackened cable from the gear, it is necessary to keep the jaws open. For this purpose, the part 39 is moved into the position shown in Figure 4 and is held therein by means of the nose of the stop bolt 41. Said part 39 actuates the crank 43 which pivots on the journals 44, the shaft 45 and the two curved links 46 which actuate the pin 28 holding the jaws open.

In the embodiment described, each jaw comprises two gripping members, which are each in two parts.

The cable passes between the jaw members 48 and 49. The two blocks include two pairs of coupled links carrying the said jaw members 48 and 49. These links are designed so that the half pins 53 and 52 rigid with said jaws 48 and 49 may be brought nearer or further away from one another when said links are lowered or raised through the connecting rod or link 34 or 35 acting on the heads 32 or 33, as the case may be. When the apparatus is inoperative, the stresses exerted by the springs 25 on said heads allow a slight clamping to be exerted on the cable 4 between the jaws 48 and 49; said female jaw member 49 (Fig. 7) carries an interchangeable wedge or shim 51 taking up the wear of the cooperating parts 48 and 49. The jaw-controlling levers 34 and 54 are journalled respectively on the half-round cooperating pins 32 and 33 and on the pins 55 and 56 rigid with the corresponding blocks.

The jaw block 6 is formed by two plates which are assembled together by cross members 57 and also support the pins 55 and 56 for the levers 34 and 54 and the pin 58 for the connecting rod 16. The block 7 is designed in a manner similar to block 6. However, the intermediary links 17 and 24 may be done away with.

The safety system (Figs. 8 to 12) which is intended to prevent the jaws from opening comprises the following arrangement for the socket 19 and the members which are coupled thereto for producing the downward movement.

The socket 19 swings about the pivot 28^a which is held in a stationary position during the upward and downward movements of the blocks. Said socket is articulated by means of the pivot 21^a to the link 23^a which in its turn is articulated at 32^a to the lever actuating the block 6 of the upper jaws and, directly, by means of the pivot 22^a to the lever 35^a which actuates the block 7 of the lower jaws.

The travel of the blocks 6 and 7 respectively supporting the upper and lower jaws, is limited by the limitation produced in the stroke of the link 23^a controlling the movement of the upper jaws.

For this purpose, the link 23^a is shaped in such a manner as to come into contact with the pivot 28^a which stops it at the point chosen for the lower end of travel (Figure 8) or the upper end of travel (Figure 9). In this manner the blocks 6 and 7 of jaws are prevented from coming into contact with one another or with the frame.

To enable the slack cable 8 to be inserted or withdrawn through the jaws which in this case should all be open, the position of the pivot 28^a is shifted in the groove 29 (Figure 11) provided in the lugs 27 which support it and which are secured to the frame.

This shifting is obtained by rocking the part 39 which is normally locked by the bolt 41. In rocking, said part, through the agency of the link 43 shifts the lever 46 the opposite end of which is secured to the pivot 28^a. This latter arrangement is illustrated in Fig. 10. Obviously the reference numbers such as 6, 7, 19, 23^a, 32^a appearing in last described Figs. 10 and 11 designate members similar to and playing the same part as the members carrying the same reference numbers in the remaining figures.

What I claim is:

1. In a cable-operated hoisting and hauling gear, the combination of a frame, two jaw blocks adapted to move simultaneously and in opposite directions in the frame over the cable and including jaws adapted to engage and release said cable, and pivoting jaw-operating levers, a first control system adapted to shift the cable with reference to the frame and including a first lever pivotally secured to the frame, two links pivotally securing the outer ends of said lever with the two blocks, for moving same in opposite directions, means for constantly urging the jaws in the blocks into engagement with the cable and means whereby the movement of either block in a predetermined direction releases the jaws in the block considered, and a second control system adapted to provide for the opposed progressive movement of the cable with reference to the frame comprising a second lever pivotally secured to the frame, two further links pivotally connecting the outer ends of said second lever with the jaw-operating levers in the blocks for constraining said blocks to move in opposite directions and the jaws therein to open when the corresponding block moves in the direction opposed to the first predetermined direction.

2. In a cable-operated hoisting and hauling

gear, the combination of a frame, two jaw blocks adapted to move simultaneously and in opposite directions in the frame over the cable and including jaws adapted to engage and release said cable, and pivoting jaw-operating levers, a first control system adapted to shift the cable with reference to the frame and including a first lever pivotally secured to the frame, two links pivotally securing the outer ends of said lever with the two blocks, for moving same in opposite directions, means for constantly urging the jaws in the blocks into engagement with the cable and means whereby the movement of either block in a predetermined direction releases the jaws in the block considered, and a second control system adapted to provide for the opposed progressive movement of the cable with reference to the frame comprising a second lever pivotally secured to the frame, two further links pivotally connecting the outer ends of said second lever with the jaw-operating levers in the blocks for constraining said blocks to move in opposite directions and the jaws therein to open when the corresponding block moves in the direction opposed to the first predetermined direction and stops on the link connecting the second lever with the jaw-controlling lever in the upper block, said stops being adapted at either end of the stroke of said second lever to engage the pivot of said second lever.

3. In a cable-operated hoisting and hauling gear, the combination of a frame, two jaw blocks adapted to move simultaneously and in opposite directions in the frame over the cable and including jaws adapted to engage and release said cable, and pivoting jaw-operating levers, a first control system adapted to shift the cable with reference to the frame and including a first lever pivotally secured to the frame, two links pivotally securing the outer ends of said lever with the two blocks, for moving same in opposite directions, means for constantly urging the jaws in the blocks into engagement with the cable and means whereby the movement of either block in a predetermined direction releases the jaws in the block considered, and a second control system adapted to provide for the opposed progressive movement of the cable with reference to the frame comprising a second lever pivotally secured to the frame, two further links pivotally connecting the outer ends of said second lever with the jaw-operating levers in the blocks for constraining said blocks to move in opposite directions and the jaws therein to open when the corresponding block moves in the direction opposed to the first predetermined direction and means for shifting the pivot of the second lever with reference to the frame for opening simultaneously the jaws in both blocks for introducing the cable between same.

4. In a cable-operated hoisting and hauling gear, the combination of a frame, two jaw blocks adapted to move simultaneously and in opposite directions in the frame over the cable and including jaws adapted to engage and release said cable, and pivoting jaw-operating levers, a first control system adapted to shift the cable with reference to the frame and including a first lever pivotally secured to the frame, two links pivotally securing the outer ends of said lever with the two blocks, for moving same in opposite directions, means for constantly urging the jaws in the blocks into engagement with the cable and means whereby the movement of either block in a predetermined direction releases the jaws in the block considered, and a second control system adapted to provide for the opposed progressive movement of the cable with reference to the frame comprising a second lever pivotally secured to the frame, two further links pivotally connecting the outer ends of said second lever with the jaw-operating levers in the blocks for constraining said blocks to move in opposite directions and the jaws therein to open when the corresponding block moves in the direction opposed to the first predetermined direction, stops on the link connecting the second lever with the jaw-controlling lever in the upper block, said stops being adapted at either end of the stroke of said second lever to engage the pivot of said second lever and yielding means carried by said pivot and adapted to urge the jaw-operating levers into their jaw closing position.

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