

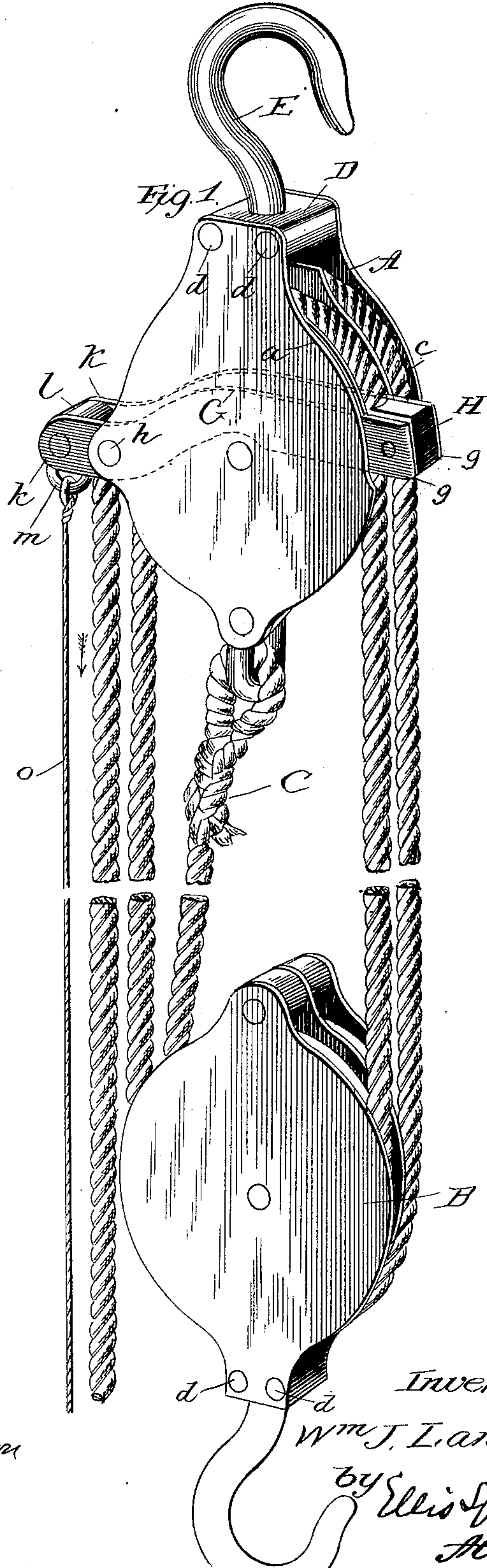
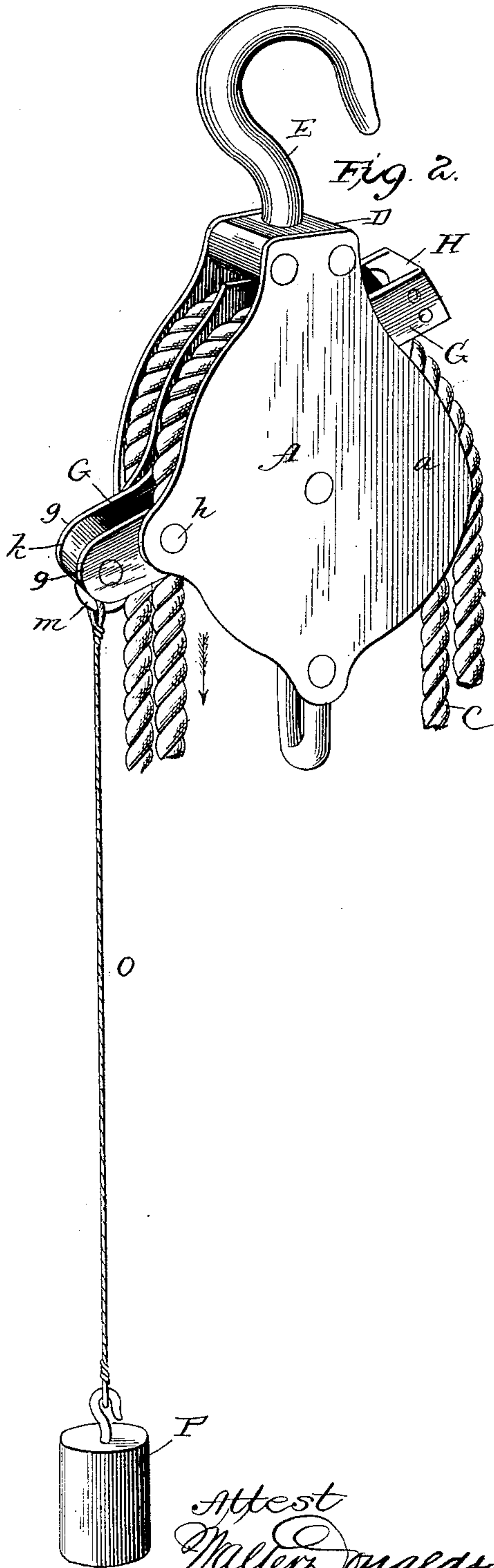
(No Model.)

2 Sheets—Sheet 1.

W. J. LANE.
TACKLE BLOCK.

No. 406,000.

Patented June 25, 1889.



Attest
Walter Donaldson
J. L. Middleton

Inventor
Wm J. Lane
by Ellis Spear
Atty.

(No Model.)

2 Sheets—Sheet 2.

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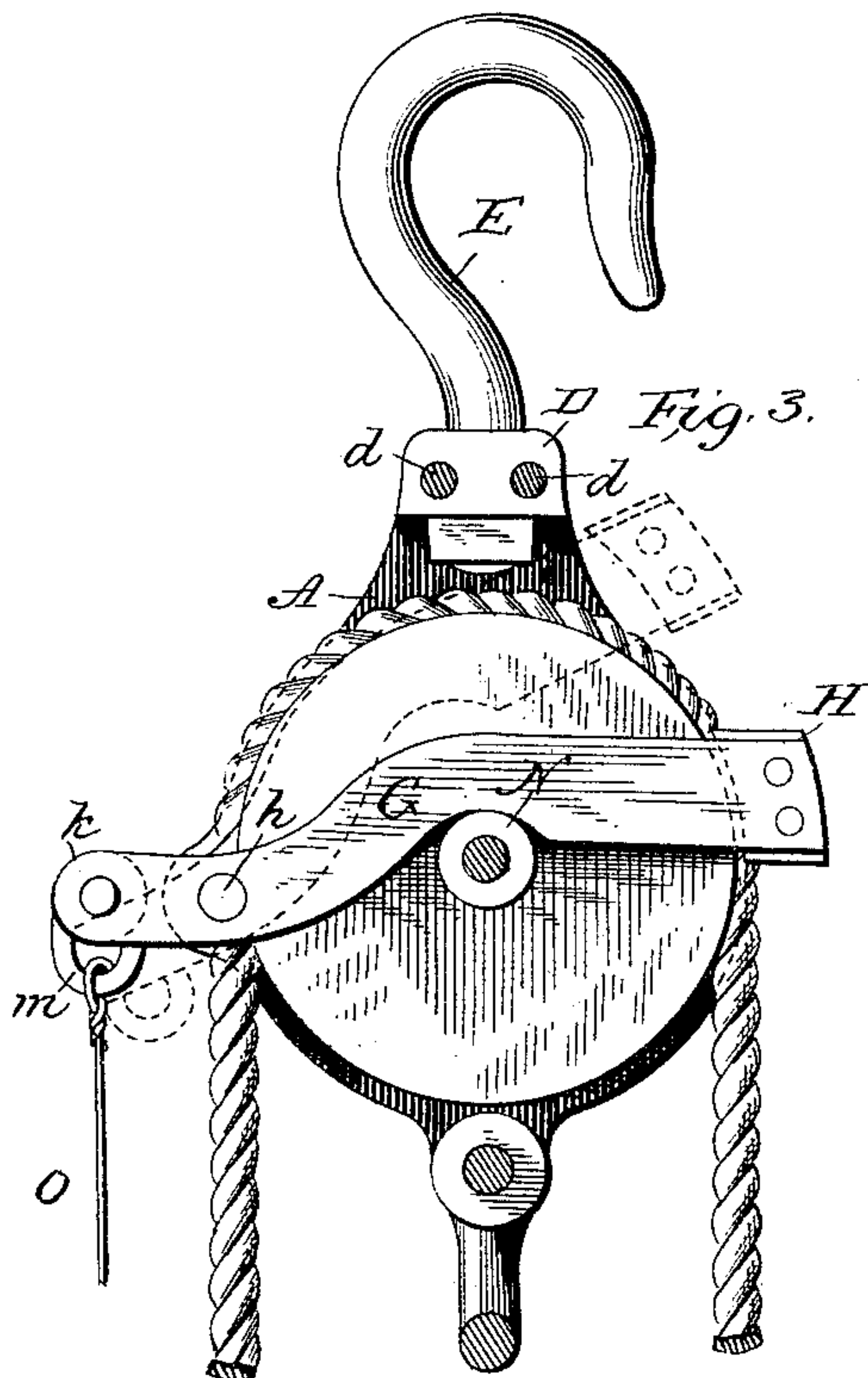


Fig. 4.

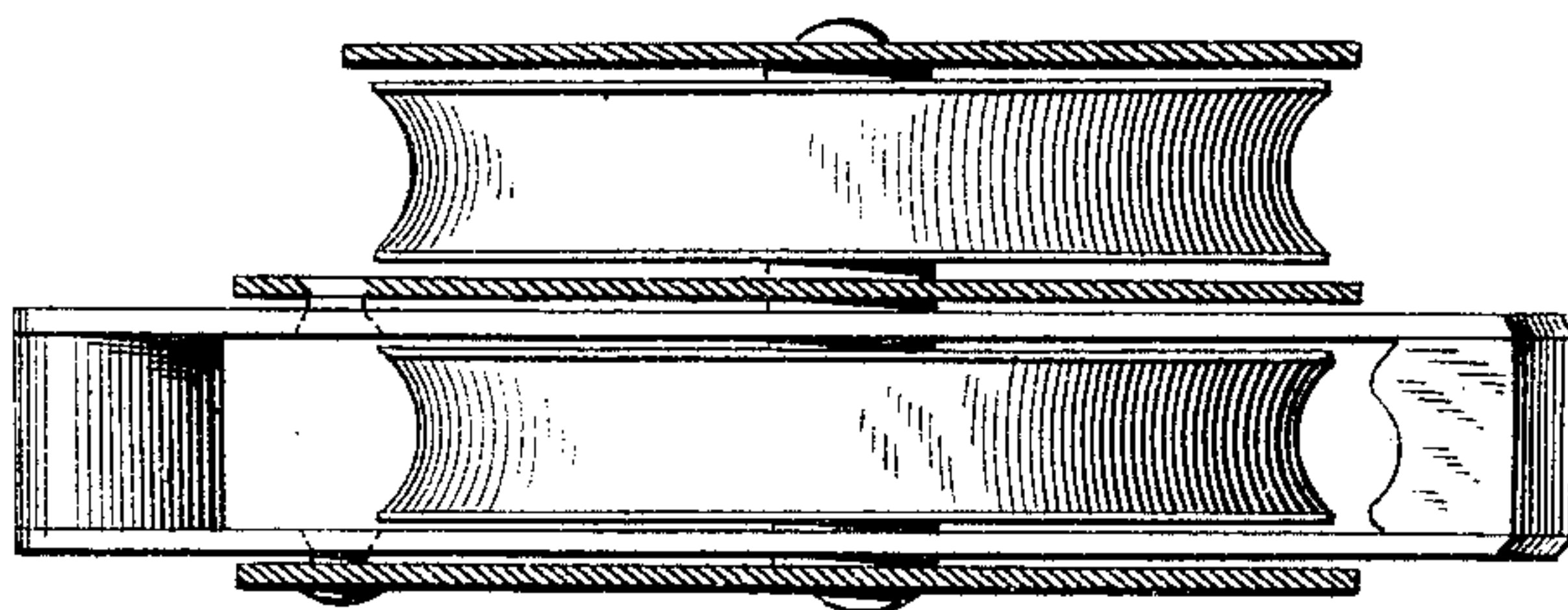
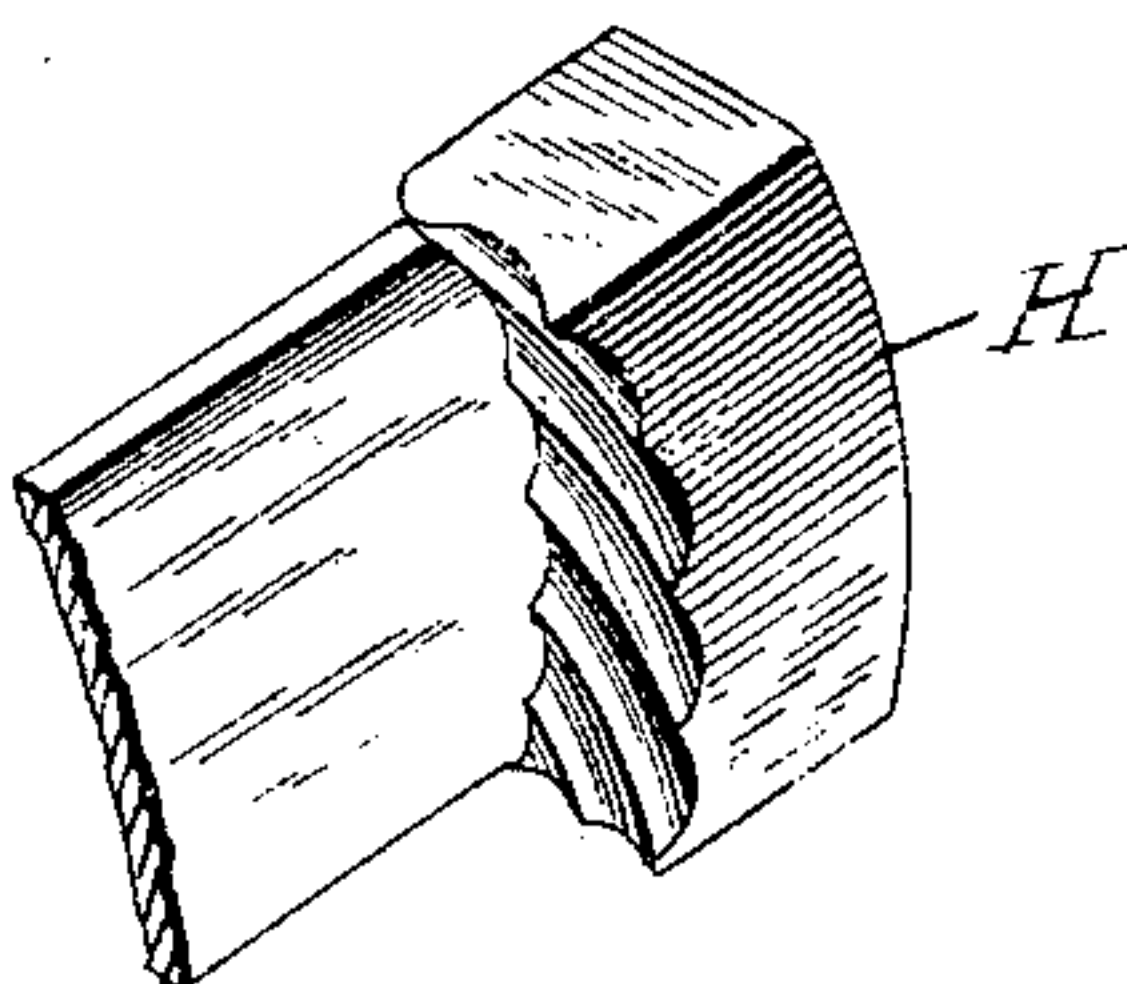


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM J. LANE, OF POUGHKEEPSIE, NEW YORK.

TACKLE-BLOCK.

SPECIFICATION forming part of Letters Patent No. 406,000, dated June 25, 1889.

Application filed January 12, 1889. Serial No. 296,147. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. LANE, of Poughkeepsie, in the county of Dutchess and State of New York, have invented a new and
5 useful Improvement in Tackle-Blocks; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to self-sustaining tackle-blocks.

10 My object is, first, to provide a tackle-block of this class perfectly automatic in its operation; second, to increase the grip on the rope; third, to prevent abrasion of the rope by the grip and to avoid any tendency of the grip to pinch
15 the rope against narrow surfaces, whereby the rope or some of the strands may be pinched or cut off.

My object, further, is to provide a block the grip of which shall be capable of being made
20 automatic in its action or be left under the control of the operator.

My object, finally, is to render the block and its grip strong and compact.

My invention is illustrated in the accompanying drawings, in which—
25

Figure 1 shows the block and tackle in perspective. Fig. 2 is a similar view of the upper part of the block and tackle, showing the grip in a different position. Fig. 3 is a sectional view, and shows the block and tackle with the grip in two positions. Fig. 4 is two
30 transverse sections centrally through the block. Fig. 5 is a detail view of the grip.

In the drawings, A represents the upper block, to which the grip is attached, and B the lower, and the rope is indicated at C. The blocks are composed of steel plates *a c*, which are connected at one end by rivets *d*, which pass through the blocks D, in which the hooks
40 E are swiveled. The other ends of the steel plates are connected by means of a bolt passing through interposed sleeves.

I have shown in the drawings double-sheaved blocks; but it will be readily understood that the invention is equally applicable to blocks having single or multiple sheaves, and it is shown as applied to the sheave over which the free or drawing end of the rope is passed.

50 In self-sustaining tackle-blocks heretofore known gripping devices have been shown in

connection with the sheave adapted to bear upon the outside of the rope and to grip by compression of the rope between itself and the periphery of the sheave. These have been
55 arranged to act also by an eccentric or wedging movement induced by the weight or resistance acting to retract the rope. My invention is based on this general principle of construction, and includes a pivoted grip
60 which bears against the rope on a line either above or upon one side of a diametrical line on the sheave.

The gripping-lever is indicated at G. The particular construction which I have shown
65 consists of two thin bars, preferably of steel and marked *g g*. These are pivoted at a point marked *h* on one side of the block by a pivot which passes through the edges of the plates of the block, and they are preferably located
70 inside of the plates and between them and the sides of the sheave. The outer ends of the bars *g g* are united by a rivet which passes through a gripping-piece II. The pivoted ends of these bars extend beyond the block-plates, as
75 shown at *k*, and are united by a rivet passing through a sleeve *l*, and also through a loop *m*. This extended end constitutes the short arm or pivoted end of the lever formed by the side bars *g g* and their connections. The grip-
80 ping-piece is a solid block, preferably of steel, having a bearing-face formed longitudinally on a curve nearly concentric with the outer surface of the rope on the sheave and with a
85 longitudinal groove approximately fitting the rope. The inner face of this groove is formed with diagonal or spiral grooves corresponding approximately to the strands of rope, so that as the block is pressed against the rope it fits
90 upon the surface and forms an extended bearing, which takes hold of the rope without presenting any sharp edges that bear across the fibers and tend to pinch the fibers transversely, which might cut or rupture them. The rope passes over the sheave and beneath
95 the gripping-block, and in raising the weight is drawn in the direction indicated by the arrow shown in Figs. 1 and 2 in connection with the free end of the rope.

To obtain the full advantage of the bearing-face of the piece II, as above described, and to obtain, also, scope of movement best
100

fitted to grip and release it, it is necessary that the gripping-piece should move in gripping and releasing in the arc of a circle larger than that of the sheaves; and for better effecting this action I have pivoted the gripping-lever G on the side of the block opposite that on which the gripping-piece is placed.

It will be noticed that the arc in which the grip-block moves will not, if continued, cut or touch the periphery of the sheave or the surface at the bottom of the groove upon which the rope rests. The path described by the grip, however, gradually approaches the bearing-surface of the sheave as the lever follows the rope downwardly, and when the grip-piece reaches a point in line with the center of the sheave and the pivot of the lever the maximum amount of pressure is derived, and at this point the movement of the lever is arrested, as hereinafter described, and while the pressure exerted upon the rope is great there will not be any tendency to abrade or cut the same by reason of the fact that the grip-surface bears squarely upon the rope throughout its extent, and the position and path of said surface at this point is practically concentric with the rope-surface.

It will be obvious that a proper pressure—such as I have just mentioned—may be obtained by having the supporting-lever of the gripping-block pivoted at a point outside the path described by the bearing-surface of the sheave, so that the convex sides of the arcs described by the two surfaces would come in close proximity to each other instead of the concave sides. The position which the lever assumes when the grip is loose, as in raising the load, is shown in Fig. 2, the gripping-face then bearing lightly upon the rope.

Whenever the free or drawing end of the rope is released or slackened and the rope returns by reason of the weight, the frictional contact of the piece H upon the rope draws the free end of the gripping-lever over a larger segment of the sheave and onto a longer segmental line, which causes it to bind more and more on the loop with constantly-increasing pressure. At the same time the gripping-piece moves on so large an angle that it does not change its position in relation to the rope to any such extent as to cause its sharp edges to cut across the fibers. In order that the movement of the gripping-lever may be arrested in gripping when a proper point of compression is attained, I provide a stop at a suitable point on the block. This may be the hub or journal of the sheave marked N, the lever being formed and extending above the horizontal or diametrical line of the sheave to come in contact with this hub when in proper position.

The grip may be released by a pull upon the hoisting-rope, and in order to allow the lowering of the load when the grip is so released I provide a small rope or cord o, which is attached to the loop on the extended end of the lever, and when the grip has been released,

as above stated, it may be held from action by drawing upon this rope. If it be desired that the grip shall not act automatically, a detachable weight P is attached to the loop on the short or pivoted end of the lever, which holds the grip constantly out of action so long as it is permitted to.

In the forms shown the gripping-lever is represented as bent, and this permits the placing of the pivotal point on a horizontal line with the center of the block, or slightly below that line. The tackle-grip may be used with ropes of different sizes within reasonable limits. The gripping-surface should always be at a distance from the center of the pivot, such that the circle in which that surface moves shall extend outside of the bottom of the groove in the sheave a space not more than equal to the diameter of the smallest rope that may ever be used with the block. The shape of the lever and its pivoted point is always such that when the gripping-block falls to a point practically the nearest to the center of the sheave its supporting-lever then encounters the stop. Under ordinary condition of lifting the grip spring block rests lightly on the rope and offers no perceptible resistance to the hauling of the load. When, however, the hauling end of the rope is slackened, it recedes slightly and carries the grip with it, causing it to approach constantly nearer to the periphery of the sheave, as explained, the form of the gripping-surface practically fitting the surface of the rope until the point is reached where the lever comes into contact with the stop. This arrests the load and sustains it. In some cases, when the load is light or the rope large or new, the movement of the grip will be less than usual, and the rope and load will be arrested and held without causing the grip-arms to engage with the stop.

When the weight is used, as above described, to hold the grip out of action and it is desired to grip and hold the load, a pull aside of the hauling-rope, and at the same time slackening same, will lift the rear end of the lever and throw the grip into engagement with the rope, and the grip will be thrown into play to sustain the load.

The length of the lever gives a strong wedging action, and therefore great pressure upon the rope; but by reason of the extent and form of the bearing-surface of the grip no injury can occur to the rope.

I am aware that levers carrying pivoted gripping-pieces loose on the levers and pivoted on one side of the tackle are not new, and that the elements of the tackle-block have been shown in other combinations. I therefore limit myself to the special combinations as below.

I claim as my invention—

1. The combination, in a tackle-block, of a sheave, a gripping-block support, a gripping-block fixed or non-pivoted on said support and arranged to move in proximity to the

sheave, the said support for the gripping-block being pivoted on the tackle-block at a point opposite the gripping-block, whereby the path described by the gripping-surface will be entirely outside of the bearing-surface on the sheave, the parts being constructed and arranged to operate substantially as described.

2. In combination with a tackle-block and a sheave, a lever pivoted upon one edge of the sheave-frame and carrying a gripping-block fixed to its free end and opposite the periphery of the sheave, the lever being arranged to come into contact with the hub of the sheave when the grip is engaged with the rope, substantially as described.

3. A gripping-lever, combined with a block and its sheave, said lever being pivoted upon one edge of the block and arranged across the same on one side of and above a diametrical line on the block, and having also its pivoted end extended to form a short arm of the le-

ver, and the holding-cord *o*, substantially as described.

4. Combined with a block and its sheave, a pivoted gripping-arm having an extension at its pivoted end adapted to be acted upon by the lifting-rope when said rope is moved out of line, substantially as described.

5. Combined with a block and its sheave, a pivoted gripping-lever having an extension on its pivoted end arranged in the described relation to the rope, and a detachable weight on said end, said weighted end being adapted to be acted upon by the lifting-rope when said rope is drawn out of line to cause the grip to act, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

W. J. LANE.

Witnesses:

G. H. SHERMAN,
F. W. DAVIS.