

(No Model.)

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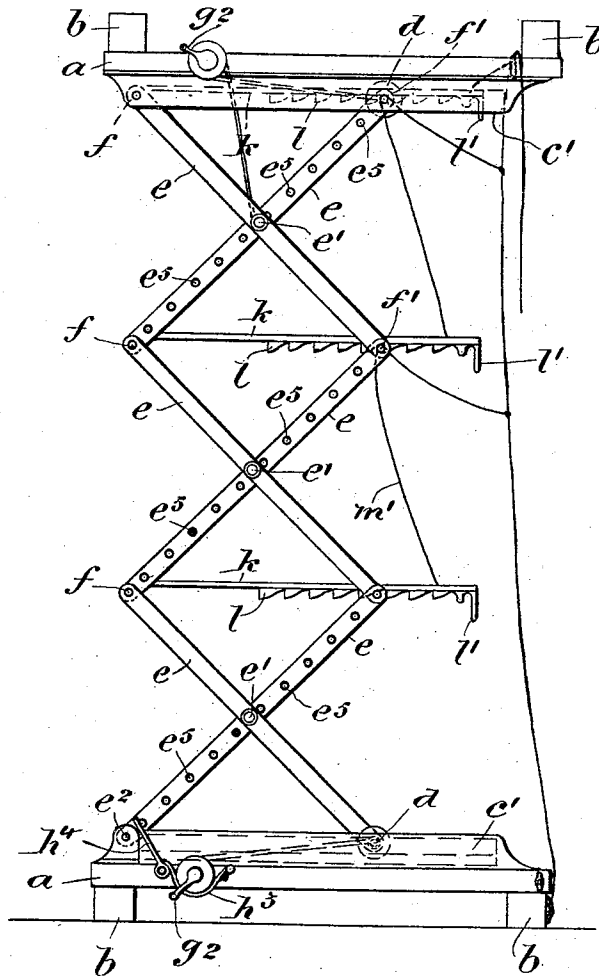
J. O. OAKLEY.

EXTENSIBLE STRUCTURE FOR USE AS A BRIDGE, SCAFFOLD,
TOWER, &c.

No. 530,120.

Patented Dec. 4, 1894.

—Fig. 1—



Witnesses

Wm. H. Sears
Fred J. Sears

Inventor

James O. Oakley
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(No Model.)

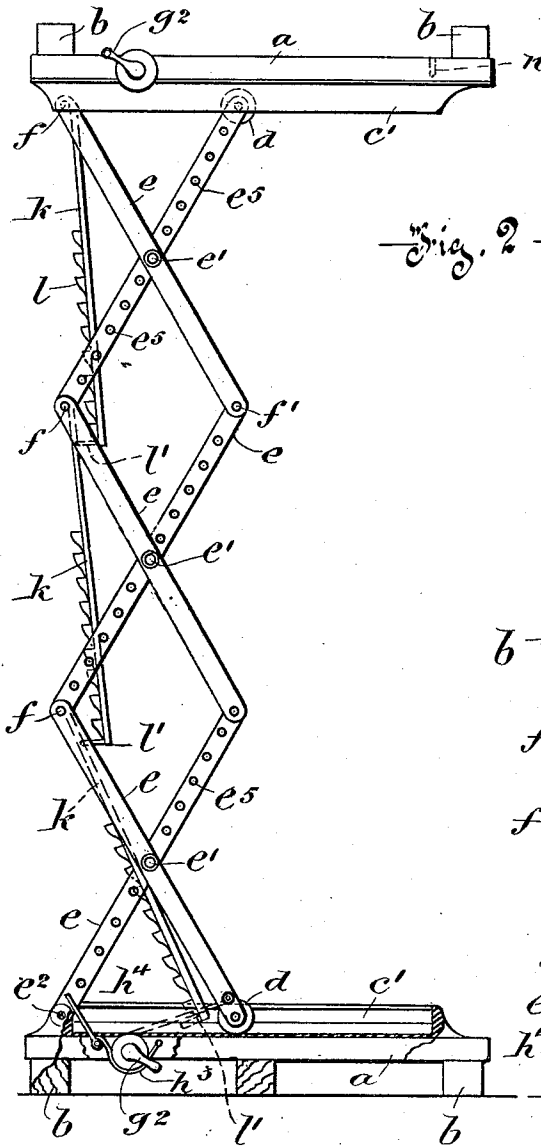
3 Sheets—Sheet 2.

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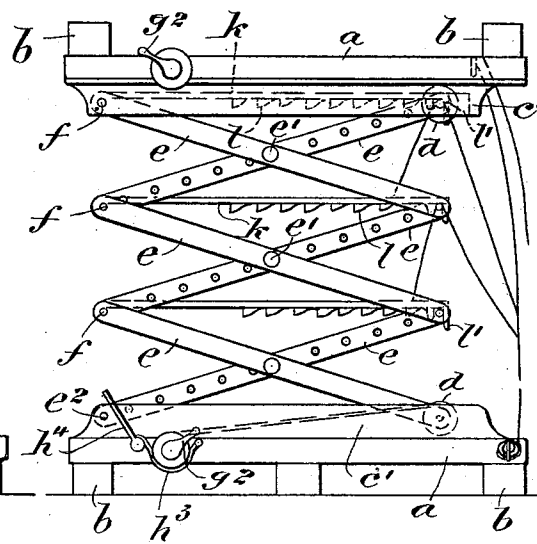
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—Fig. 2—

—Fig. 5—



Witnesses

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(No Model.)

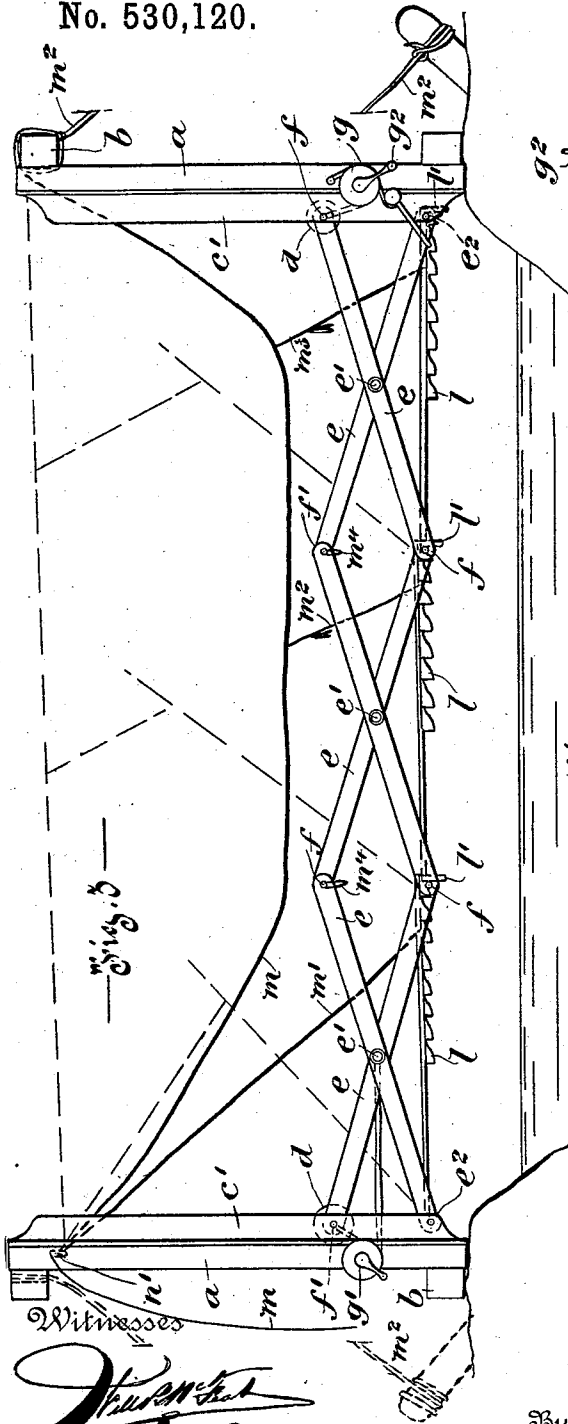
3 Sheets—Sheet 3.

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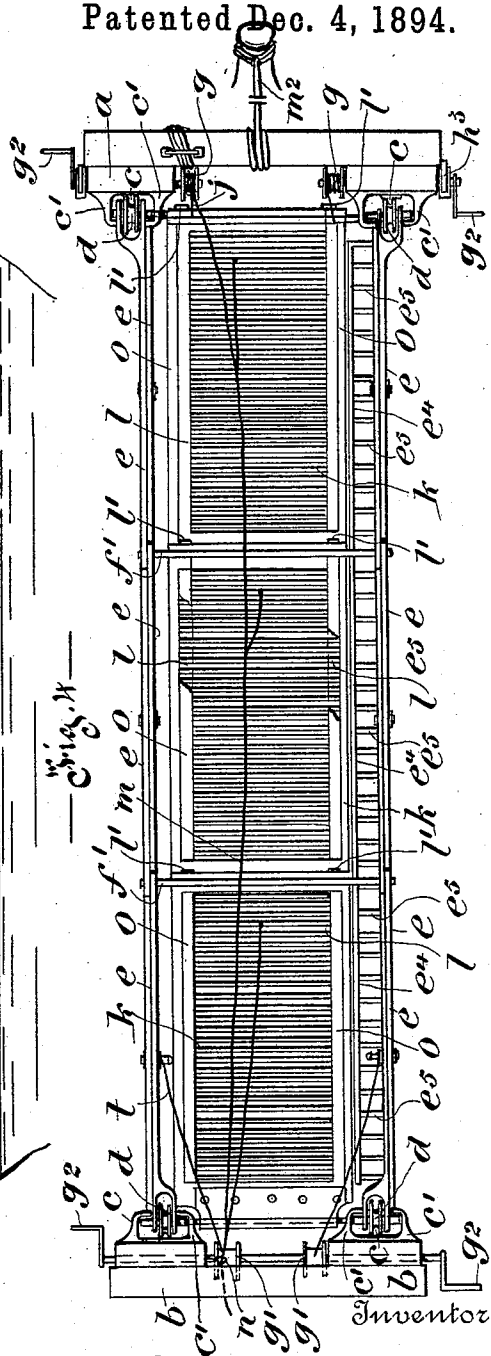
No. 530,120.

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Witnesses

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UNITED STATES PATENT OFFICE.

JAMES OMAR OAKLEY, OF MONTREAL, CANADA.

EXTENSIBLE STRUCTURE FOR USE AS A BRIDGE, SCAFFOLD, TOWER, &c.

SPECIFICATION forming part of Letters Patent No. 530,120, dated December 4, 1894.

Application filed September 26, 1893. Serial No. 486,568. (Model.)

To all whom it may concern:

Be it known that I, JAMES OMAR OAKLEY, of the city of Montreal, in the district of Montreal and Province of Quebec, Canada, have
5 invented certain new and useful Improvements in Extensible Structures, Adapted for Use as a Bridge, Scaffold, Tower, or Ladder and the Like; and I do hereby declare that the following is a full, clear, and exact description
10 of the same.

This invention relates to portable structures of the extensible lazy-tong construction and has for its object to furnish a device or structure equally applicable as a bridge, scaffold, tower, ladder or even fire escape by the
15 simple transposition or different location of its parts.

Heretofore structures to be used as fire escapes have been constructed in which there
20 has been combined with lazy-tong side frames pivoted sliding platforms capable of horizontal movement and disposition at right angles or transversely to the length of the vertical structure and of a limited rotatory movement to an oblique angle, but in no case has
25 it been attempted to adapt such a structure for use in any other than a vertical position, nor to arrange such platforms so that they can be changed in position to allow of the structure being used as a bridge or ladder and
30 to effect this is the object of my invention.

The invention consists in the several arrangements, devices and combinations of parts hereinafter particularly described and
35 pointed out in the claims.

For full comprehension however of the invention, reference must be had to the annexed drawings, forming a part of this specification, in which like symbols indicate corresponding parts and wherein—
40

Figure 1 is a side elevation of the structure elevated for use as a scaffold; Fig. 2, a side elevation partly broken away of the structure in use as a ladder, while Figs. 3 and
45 4 are respectively a side elevation and a plan of the structure in use as a bridge, and Fig. 5 a side elevation of the structure in its collapsed condition.

a and b are respectively the longitudinal and cross bars of frames forming when the structure is in scaffold form suitable base and
50 head pieces therefor, the longitudinals each

carrying on their surfaces runways with central rail c and flanged side guards $c' c'$ to receive grooved rollers $d d d d$ on the upper
55 and lower ends respectively of one pair of the bottom and top bars of the side frames formed of a number of "lazy-tong" sections or bars $e e$ pivotally connected at their centers individually by studs e' and at their ends
60 by means of rods $f f'$ extending between the two sides, the opposite pairs of the top and bottom bars being pivotally connected at e^2 to the longitudinals $a a$ of the head and base pieces.

$g g'$ are winding drums located between the longitudinals and cross bars of the base and head respectively and having their spindle bearings in such sills near the ends to which
65 the bars $e e$ are pivotally connected.

$g^2 g^2$ are crank handles for rotating said drums, j being the necessary rope or other flexible connection between the drum g and the cross rods f' whereby the lower ends of the free traveling bottom bars of the structure may be drawn toward the pivoted ones
70 and the apparatus extended.

$k k$ are foot sections or platforms made in the form of frames containing rows of cross bars or rungs about a couple of inches apart, and of such a length that with one end pivotally connected with the cross rods f the opposite free ends will when the lazy tong sections are collapsed to their fullest extent come within the bars f' so as to clear the same and consequently be alterable from their position
75 at right angles to the length of the structure to a parallel position therewith thus allowing the use of the structure as a bridge or ladder as shown in Figs. 2, 3, and 4.

On the under sides of the foot sections $k k$ are arranged ratchet toothed racks $l l$ running lengthwise thereof and each having at their outer end a right angled tooth l' of greater projection than the ratchet teeth, which latter engaging the rods f' act to hold the structure rigid and prevent collapsing when in scaffold form while not interfering with its elevation, and the teeth l' performing the same function when the structure is being
80 used as a bridge, their point of engagement being between the rods f and the adjacent ends of the foot sections, as shown in Fig. 3 sufficient space being left for the purpose.

m is a rope preferably taken through an eye n on the ends of the longitudinals a opposite to those where the winding drums are located and being sufficiently long to extend the full length of the structure, and to this, what I may term main rope are connected branch ropes $m^1 m^2 m^3$ taken when the structure is used as a scaffold, through eyes $m^4 m^4$ carried by the cross rods f' to and connected with the foot sections k for the purposes of freeing the cross rods f' from the teeth on the foot sections so that the bars may collapse, this being done by drawing upon the ropes and elevating the foot sections k as indicated by dotted lines in Figs. 1 and 3.

As a means of ascent for the structure in scaffold form I have shown duplicates e^4 of the bars e up one side of the structure and connected by rungs e^5 thus forming ladder sections between each foot section or platform, but this I lay no claim to as I am aware that such an arrangement is not new.

To elevate the structure it is only necessary to rotate the drum g , the foot sections being elevated sufficiently by pulling on the ropes m to allow the cross rods f' to pass the tooth l' after which they can be allowed to rest on the rods since the ratchet teeth will not interfere with the further movement of such rods.

To lower the structure the foot sections are elevated, any tendency to a rapid collapse being readily checked by any suitable break mechanism such as flexible band h^3 and lever h^4 acting on the drum g .

In using the structure as a bridge the rope connections are freed sufficiently to allow the foot sections to be turned in past the rods f' and to take positions lengthwise of the structure as shown in Fig. 3 and a spare piece of rope m^2 is used to stay the structure by securing one end to cross piece b and the other to any convenient anchor, such as a tree, or post in the vicinity or even a heavy stake such as is driven into the ground, and the structure turned on its side so that the ends of the base longitudinals carrying the winding drum g shall rest on the ground and the longitudinals be held in perpendicular position by the rope m^2 . This done it is only necessary to rotate the drum g in order to extend the structure across the gap to be bridged, the free opposite end or head piece reaching the other side and being supported there, each of the several foot sections sliding over the metal faced ends O of the other until the long tooth l' reaches such end when it drops into the open space between the rods f and the ends of the sections O thus firmly bracing the structure. Extra guy ropes m^3 for additional security when the structure is to be extended can be secured to either of the cross rods f' and connected to any convenient point. If it is desired after crossing the bridge thus formed, to carry it bodily to the opposite point reached a similar piece of rope, to m^2 is provided and arranged in like manner to stay the head longitudinals, after which the guy

rope ends first secured are undone. The party undoing them crosses the bridge, elevates the foot sections (first drawing the branch ropes $m^2 m^3$ out of their eyes $m^4 m^4$ shortening them and again connecting them as shown in Fig. 3 to the foot section) and by drawing on the rope connections m makes them fast at any convenient point about the longitudinals and then proceeds to turn the drum g' from which flexible connections $t t$ extend to the head end bars $e e$ of the structure at their central pivotal connection whereby the whole structure is collapsed and thus transferred to the point desired.

In lowering the structure when in ladder form it is not necessary to have the ropes connected to the platforms, as they (the platforms) will have a tendency to slide outward the lowermost in the flanges c' and the remainder on one another as shown in Fig. 2.

What I claim is as follows:

1. An extensible structure having lazy-tong sides and two rows of cross rods with foot sections or platforms permanently connected at one end with the rods of one row, detachably connected with the rods of the opposite row and changeable from a position transversely of said structure to a position lengthwise of same for the purpose set forth.

2. An extensible lazy-tong structure having lazy-tong sides and two rows of cross rods with foot sections or platforms pivotally connected at one end with the rods of one row, detachably connected with the rods of the opposite row and changeable from a position transversely of said structure to a position lengthwise of same for the purpose set forth.

3. An extensible structure having lazy-tong sides, made up of sets or sections of pivoted bars and cross rods at the ends of each set of bars with independent foot sections or platforms permanently connected at one end of a section with a cross rod thereof and arranged and movable longitudinally of said structure to be connected with the cross rod at the end of the next section, with means for disconnecting such platforms from the last mentioned cross rod, for the purpose set forth.

4. An extensible lazy-tong structure having lazy-tong sides made up of sets or sections of pivoted bars and cross rods at the ends of each set of bars with independent foot sections or platforms pivotally connected at one end of a section with a cross rod thereof and arranged and movable longitudinally of said structure to be connected with the cross rod at the end of the next section, with suitable flexible line and connections for disconnecting the platforms from the last mentioned cross rod, for the purpose set forth.

5. An extensible structure having side frames formed of lazy tong sections connected by two rows of cross rods as $f f'$, and foot sections or platforms pivotally connected at one end with the cross rods f and adapted, when the structure is extended in a vertical direction to rest with their opposite ends upon the

rods f' , and when the structure is extended in a horizontal direction, each to rest with its opposite end upon the supporting cross rod f of another section or upon such section as set forth.

6. An extensible structure comprising side frames formed of lazy-tong sections connected by two rows of cross rods ff' , rigid end pieces or frames, one bar of each side section at both ends of the structure having a stationary pivotal connection with the end pieces and the other bar of such sections having a traveling pivotal connection therewith; foot sections or platforms pivotally connected at one end with the cross rods f and adapted when the structure is extended in a vertical direction, to rest with their opposite ends upon the rods f' , and, when the structure is extended in a horizontal direction, each to rest with its opposite end upon the supporting cross rod f of another section or upon such section as set forth.

7. An extensible structure having side frames formed of lazy-tong sections connected by two rows of cross rods as ff' , and foot sections or platforms, with locking teeth or projections on their under sides, and pivotally connected at one end with the cross rods f and adapted when the structure is extended in a vertical direction to rest with their opposite ends upon the rods f' , and when the structure is extended in a horizontal direction, each to rest with its opposite end upon the supporting cross rod f of another section and means for raising said opposite ends of such sections out of contact with said rods f for the purposes set forth.

8. An extensible structure comprising side frames formed of lazy-tong sections connected by two rows of cross rods as ff' , rigid end pieces or frames, one bar of each side section at both ends of the structure having a stationary pivotal connection with the end pieces, and the other bar of such sections having a traveling pivotal connection therewith; means for moving the bars having the traveling connection with the end pieces toward

the ends of the bars having the stationary pivotal connection therewith, and suitable brake mechanism to prevent the too rapid return of such bars to their normal position; foot sections or platforms pivotally connected at one end with the cross rods f and adapted when the structure is extended in a vertical direction to rest with their opposite ends upon the rods f' and when the structure is extended in a horizontal direction each to rest with its opposite end upon the supporting cross rod f of another section or upon such section as set forth.

9. An extensible structure comprising side frames formed of centrally pivoted lazy-tong sections connected by two rows of cross rods as ff' , rigid end pieces or frames, one bar of each side section at both ends of the structure having a stationary pivotal connection with the end pieces, and the other bar of such sections having a traveling pivotal connection therewith; means at opposite ends of the structure, for respectively moving the bars having the traveling connections with the end pieces, toward and away from the ends of the bars having the stationary pivotal connection therewith, and suitable brake mechanism to prevent the too rapid return of such bars to their normal position, foot sections or platforms with ratchet teeth and projection l' on their under sides and pivotally connected at one end with the cross rods f and adapted when the structure is extended in a vertical direction to rest with their opposite ends upon the rods f' and when the structure is extended in a horizontal direction each to rest with said projections l' between another rod f' and the adjacent edge of the section pivoted to same or upon such section; and suitable guy ropes and connections for raising said foot sections, all substantially as and for the purposes set forth.

Montreal, August 26, 1893.

JAMES OMAR OAKLEY.

In presence of—

WILL P. McFEAT,
FRED. J. SEARS.