(No Model.) 3 Sheets—Sheet 1.

W. WOOD.

TRAVELING CRANE.

No. 456,186. Patented July 21, 1891.

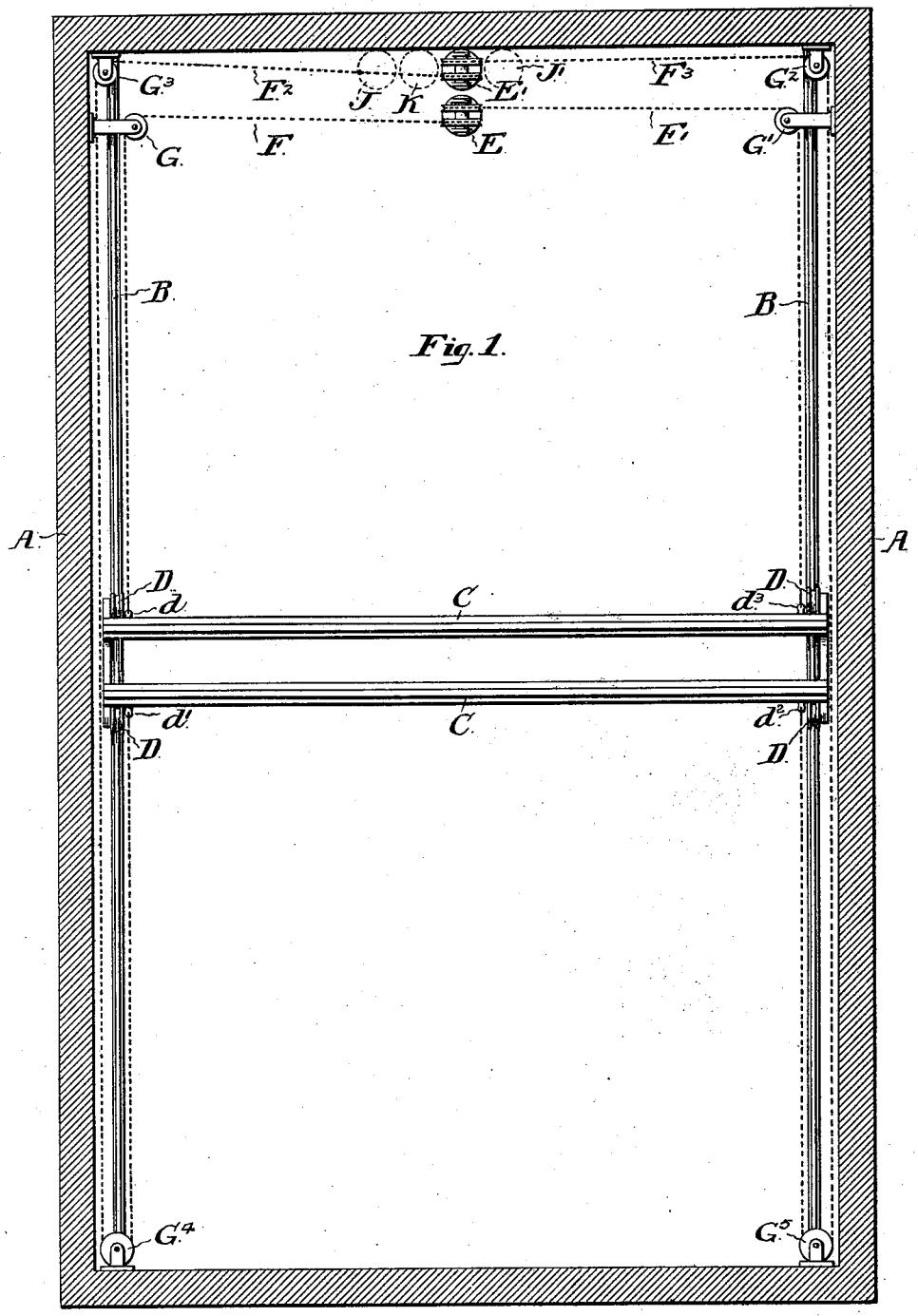

Fig. 1.

WITNESSES:
James H. Bell.
A. E. Paige

INVENTOR:
Walter Wood
BY Hollingsworth & Bailey
ATTORNEYS.

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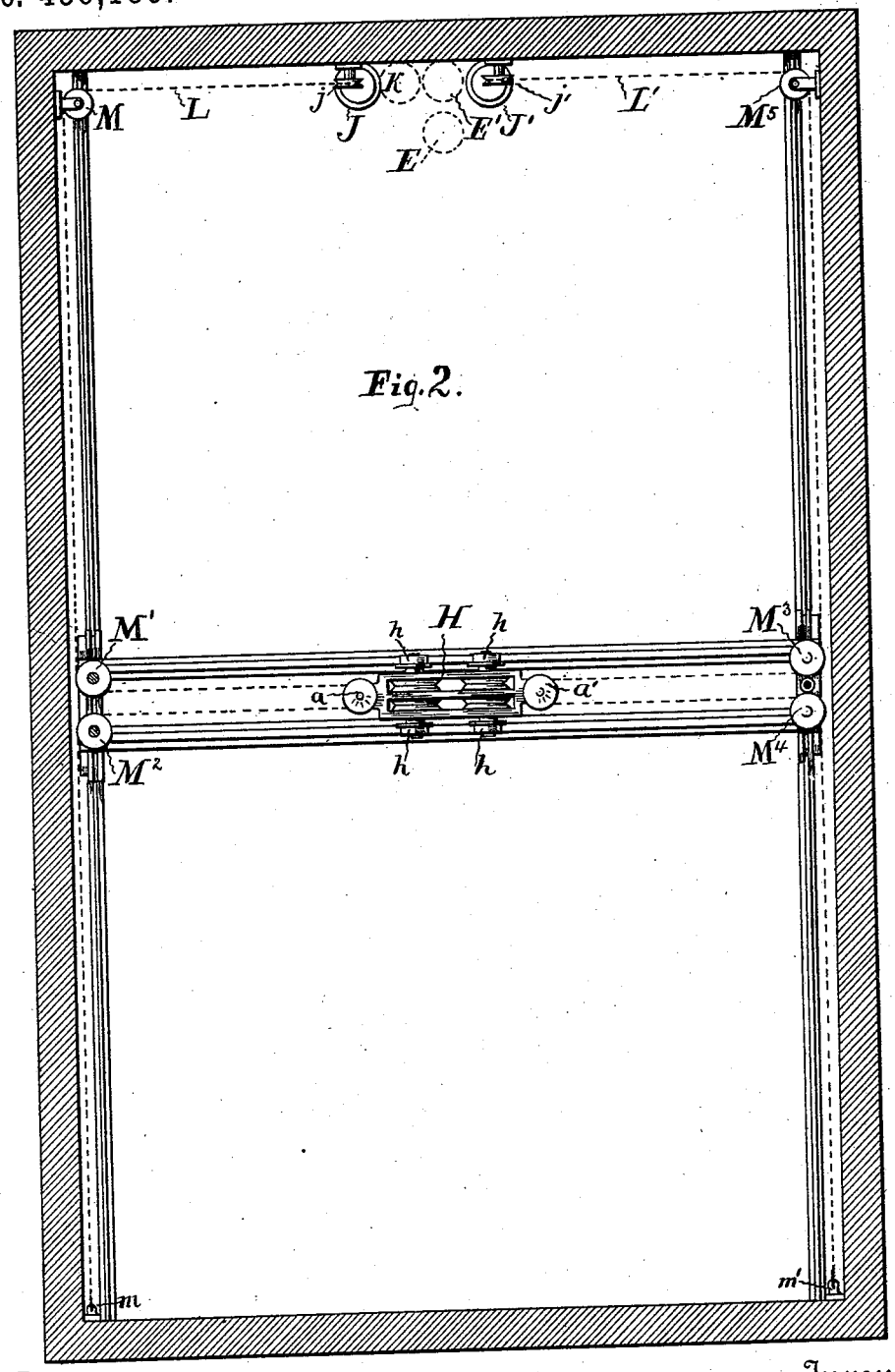

Fig. 2.

Witnesses
James H. Bell
Henry M. Paul Jr.

Inventor
Walter Wood

By his Attorneys
Hollingsworth & Macy

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W. WOOD.

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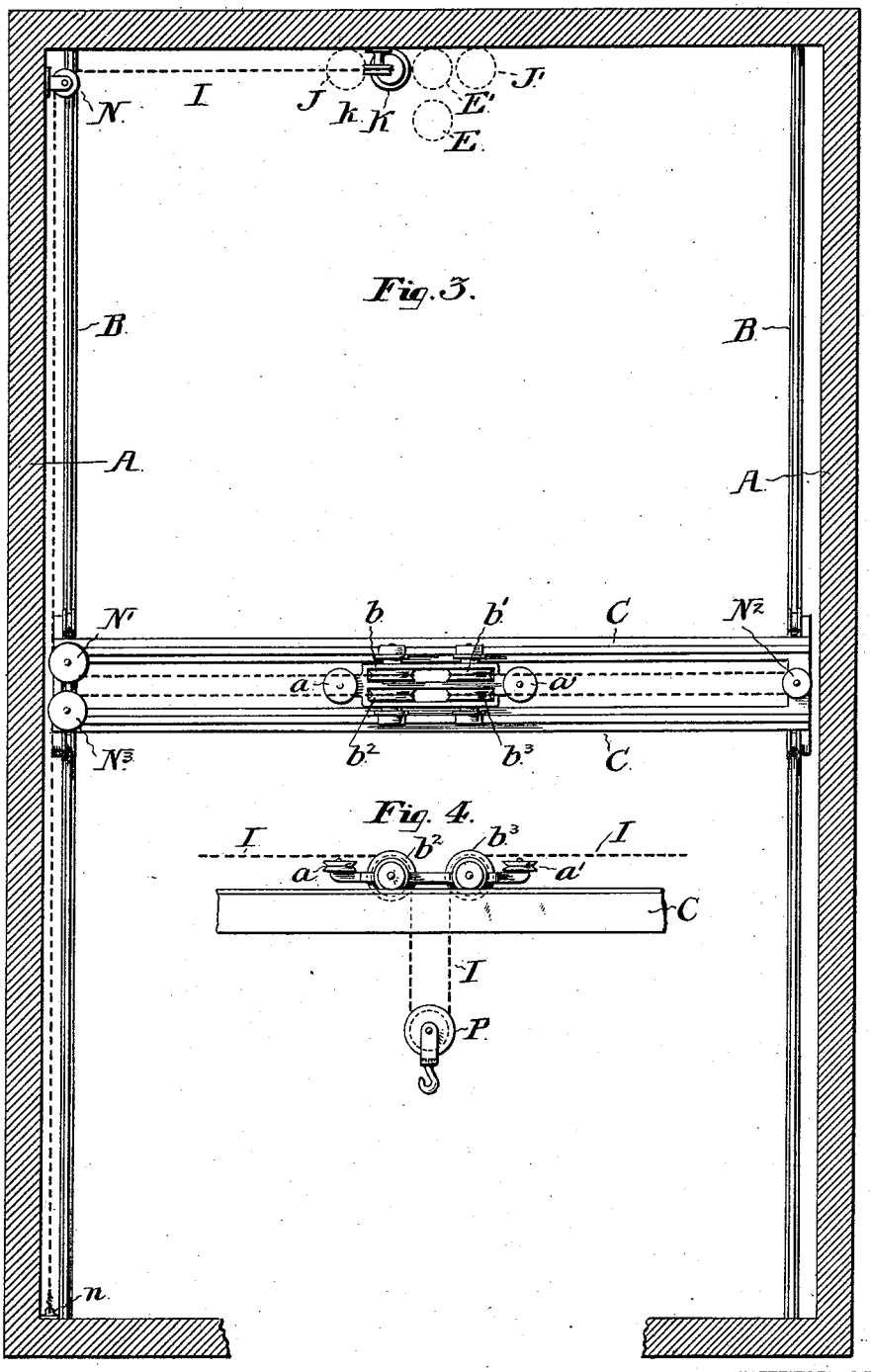

Fig. 3.

Fig. 4.

WITNESSES:

James H. Bell.

A. E. Paige.

INVENTOR

Walter Wood

By Kellogg Crosby & Paley

Attorneys

UNITED STATES PATENT OFFICE.

WALTER WOOD, OF PHILADELPHIA, PENNSYLVANIA.

TRAVELING CRANE.

SPECIFICATION forming part of Letters Patent No. 456,186, dated July 21, 1891.

Application filed March 27, 1890. Serial No. 345,614. (No model.)

To all whom it may concern:

Be it known that I, WALTER WOOD, of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Traveling Cranes, whereof the following is a specification, reference being had to the accompanying drawings.

For convenience of description the three movements which are essential in a traveling crane may be classified as follows: first, the bridge movement or travel of the crane as a whole along its ways; second, the trolley movement or travel of the trolley along the bridge, and, third, the lifting movement, whereby the fall-block or other device suspended beneath the trolley and carrying the weight is raised or lowered.

As heretofore constructed traveling cranes have embodied various devices for effecting these three movements, the actuating mechanism or source of power being sometimes mounted upon the bridge itself, and in other cases at a point independent thereof. In some instances the lifting movement and the trolley movement have been obtained by means of ropes, chains, or cables actuated from a point independent of the structure, and in my patents, Nos. 433,156, 433,157, and 433,158, granted July 29, 1890, I have described and claimed devices for effecting the bridge movement and the trolley movement or the bridge movement and the lifting movement, or all three movements by means of the rope, the respective ropes in all these cases being actuated from a point independent of the structure. All these devices, however, depend for their operation upon the use of brakes located upon the bridge or trolley or both and operating to temporarily form fixed anchoring-points for the ropes.

The object of my present invention is to derive all three movements from points independent of the structure while dispensing with the use of brakes, and at the same time to so arrange the actuating-ropes as to permit any one or more of the movements to be made without affecting each other and without affecting the position of that member of the group which is for the time being inactive.

In the accompanying drawings, Figure 1 represents a plan view indicating the walls of the building along which the bridge is to travel, said figure illustrating only the application of the bridge-shifting rope. Fig. 2 is a similar view, showing only the application of the trolley-shifting rope. Fig. 3 is a similar plan view, showing only the application of the lifting-rope; and Fig. 4 is a partial view in elevation of the bridge and trolley, showing the adjacent bight of the lifting-rope.

A represents the walls of the building or other inclosure along which the tracks B B are arranged in the usual manner for the travel of the bridge C upon its rollers D. H is the trolley, adapted to travel along the bridge C by means of rollers *h*, and P is the fall-block suspended beneath the trolley.

I prefer to group the actuating mechanism proper at one end of the line, which I will term the "initial end," and in the present instance said actuating mechanism is indicated as consisting of hydraulic cylinders E E′, J J′, and K, having plungers of the ordinary construction, by means of which ropes attached thereto can be hauled in or paid out.

Referring now to Fig. 1, the bridge-shifting devices are as follows: From the plunger of the cylinder E the rope F leads around a pulley G, arranged near the initial end of the line, to a point of attachment *d* at one end of the bridge. A second rope F′ also leads from said plunger around a pulley G′, arranged near the initial end of the line, to a point of attachment d^3 at the opposite end of the bridge from the other point of attachment. A third rope F^2 leads from the plunger of the second cylinder E′ around a pulley G^3 at the initial end of the line, and thence passes to the distant end of the line, where it leads around a pulley G^4 to a point of attachment *d′* upon the bridge, at the same end as the point of attachment *d*, but upon the opposite side of the bridge. A fourth rope F^3 leads from the plunger of the cylinder E′ around a pulley G^2 at the initial end of the line, thence passes to the distant end of the line, where it returns around a pulley G^5 to a point of attachment d^2 upon the bridge, said point being on the opposite side to the point d^3, but at the same end of the bridge.

It is obvious that if the plunger of the cylinder E be actuated so as to haul in the ropes F F′ and the plunger of the other cylinder E′ be simultaneously actuated in the opposite

direction to pay out the ropes F^2 F^3 the bridge will be shifted toward the initial end of the line, and that the converse movement of the plungers will shift the bridge in the opposite direction.

Referring now to Fig. 2, the trolley-shifting ropes are arranged as follows: From the plunger of the cylinder J the rope L rises over a pulley *j* to and around a pulley M near the initial end of the line, thence it leads to the end of the bridge, where it passes around a pulley M′ to and around a pulley *a* upon one end of the trolley, and thence returns to the end of the bridge at which it entered, and after passing around a pulley M^2 leads to a fixed anchoring-point *m* at the distant end of the line. Upon the opposite side a rope L′ is similarly arranged, leading from the plunger of the cylinder J′ over and around the pulleys *j*′ M^5 to the pulley M^3 at that end of the bridge, then passing to and around the pulley *a*′ upon the trolley, and returns to the end of the bridge and leaves it, passing around the pulley M^4 to a fixed point of attachment *m*′ at the distant end of the line.

By comparing the views of Figs. 1 and 2 it will be seen that the bridge movement can be made without affecting the position of the trolley, since the ropes L L′ run freely upon the pulleys *a a*′, which constitute their connection with the trolley, and of course the trolley movement can be effected without altering the position of the bridge. So, also, both of these movements can go on at the same time.

The above-described arrangement of the ropes for shifting the trolley has been instanced as a convenient type of apparatus well adapted to be used in conjunction with the other members, whose combination as an entirety constitutes my invention; but it must be understood that I do not claim said trolley-shifting ropes, arranged in the manner shown, either in themselves or in combination with the traveling bridge.

Referring now to Figs. 3 and 4, the lifting-rope and its actuating mechanism will be described. From the plunger of the cylinder K the rope I passes over a guiding-pulley *k* to and around a pulley N, arranged near the initial end of the line, and thence leads to and around the pulley N′ at one end of the bridge. Passing from thence to the trolley, it descends over the pulley *b* to one sheave of the fall-block P, rises again to the trolley, passes over the pulley *b*′, and thence leads to a pulley N^2, arranged at the end of the bridge opposite to that at which it first entered, thence it returns to the trolley and descends over the pulley b^3, passes around another sheave of the fall-block P, rises over the pulley b^2 of the trolley, and returns to the end of the bridge where it first entered, after which, passing around the pulley N^3, it leads to fixed anchoring-point *n* at the distant end of the line.

Comparing the view of Fig. 3 with those of Figs. 1 and 2, it will now be seen that the lifting movement can be effected by actuating the plunger K in one direction or the other without any relation to the other two movements and either independently thereof or simultaneously therewith, and that as the rope I runs freely around the sheaves of the fall-block and trolley-pulleys *b b*′ b^2 b^3 the vertical position of the fall-block will not be affected by either the bridge movement or the trolley movement.

The above arrangement of the actuating-ropes and the method of connecting them with the several members of the structure is given as typical of an embodiment of the invention, which, under some circumstances, will be found most convenient; but I desire it to be understood that I do not limit my claim to the precise form thus shown, since the essence of the invention lies in the fact that each of the moving members is provided with its individual rope or ropes for the independent actuation thereof. Nor do I herein claim the particular arrangement of the bridge-shifting rope, or the trolley-shifting ropes, or the lifting-rope, or any sub-combination of the same.

The novelty of the present invention lies in the fact that I entirely dispense with the use of brakes upon the bridge or trolley, and by the system of arrangement above specified derive all three movements from a point or points independent of the structure and without interference of the actuating devices.

Having thus described my invention, I claim—

In a traveling crane, the combination of longitudinal ways, a transverse bridge adapted to travel thereon, a trolley adapted to travel along said bridge, a fall-block suspended beneath said trolley, a rope leading from an actuating-point independent of the structure to the initial end of the line and thence to the point of attachment on the bridge, a rope leading from a similar actuating-point to the distant end of the line and thence returning to a point of attachment on the bridge, the ropes connected with each end of the trolley, leading thence to the proximate ends of the bridge, and thence to the respective ends of the line, a rope leading from a similar actuating-point to the initial end of the line, thence to the one end of the bridge, thence to the proximate end of the trolley, thence descending in a bight around the sheave of the fall-block, thence rising to the other end of the trolley and leading to the other end of the bridge, thence passing (either directly or by way of the bridge, trolley, and fall-block) to the distant end of the line, and actuating mechanism for each of said ropes, substantially as set forth.

WALTER WOOD.

Witnesses:
THOMAS S. JUSTUS,
JAMES H. BELL.