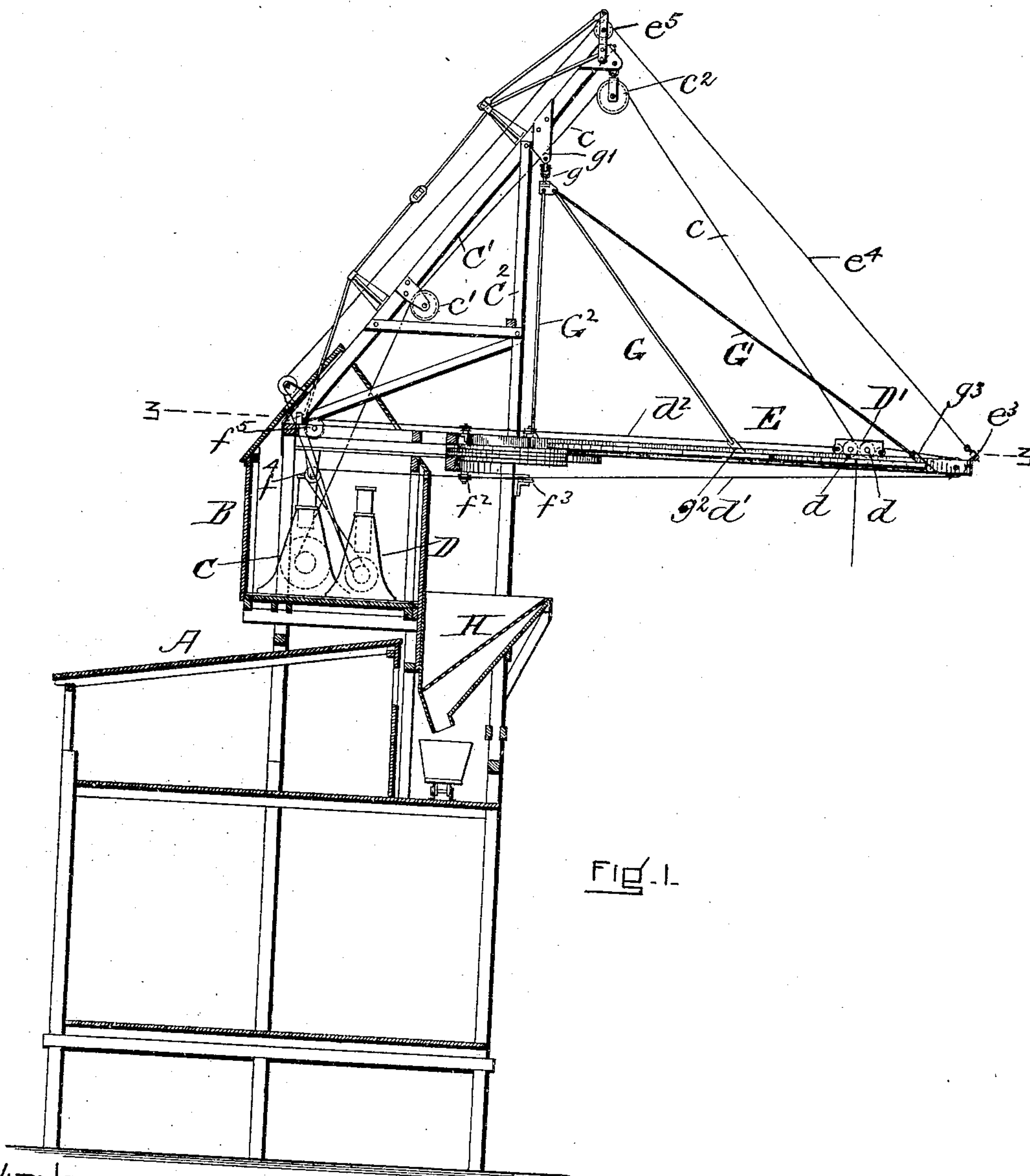


No. 814,271.

PATENTED MAR. 6, 1906.

J. CAMPBELL.
APPARATUS FOR HANDLING COAL, &c.
APPLICATION FILED JAN. 14, 1905.

3 SHEETS—SHEET 1.



WITNESSES =

M. E. Flaherty
M. V. Foley

INVENTOR =

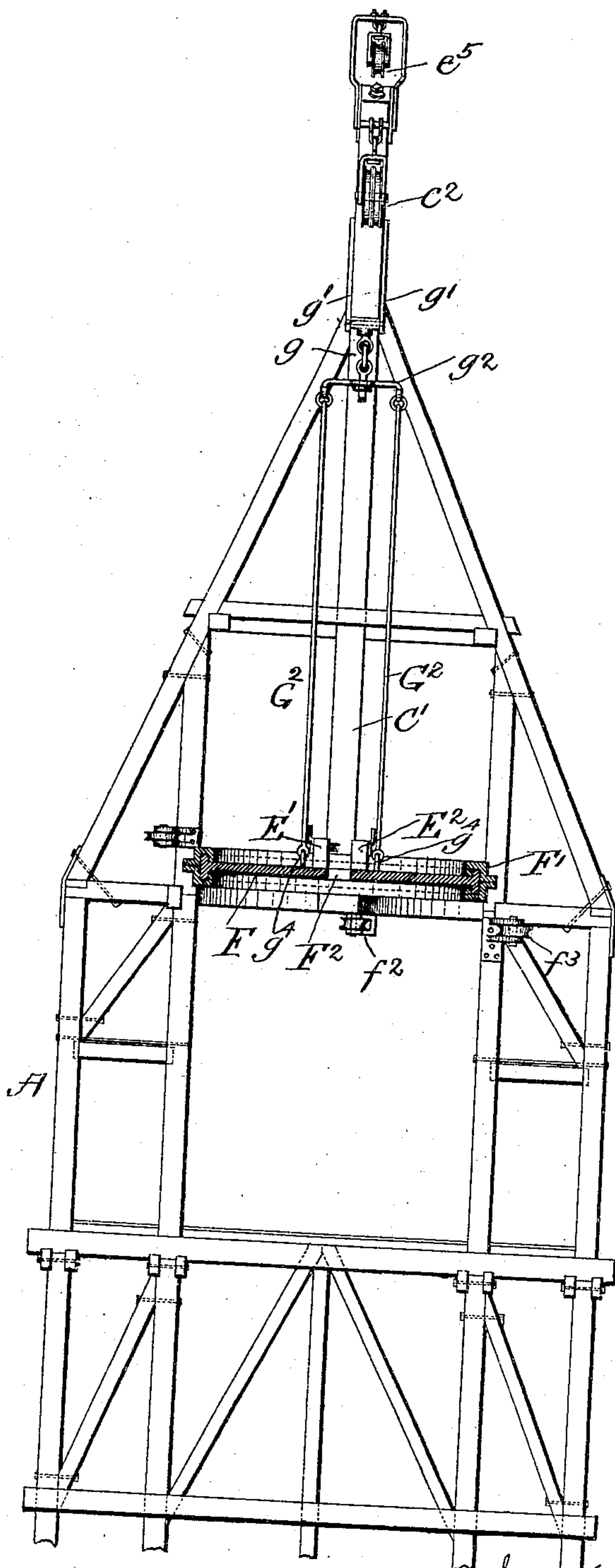
J. Campbell
by his atty
Charles Raymond & Co.

No. 814,271.

PATENTED MAR. 6, 1906.

J. CAMPBELL.
APPARATUS FOR HANDLING COAL, &c.
APPLICATION FILED JAN. 14, 1905.

3 SHEETS—SHEET 2.



WITNESSES:
H. C. Flaherty
M. V. Foley

FIG. 2.

INVENTOR:
J. Campbell
by his atty.
Clarke, Raymond & Co.

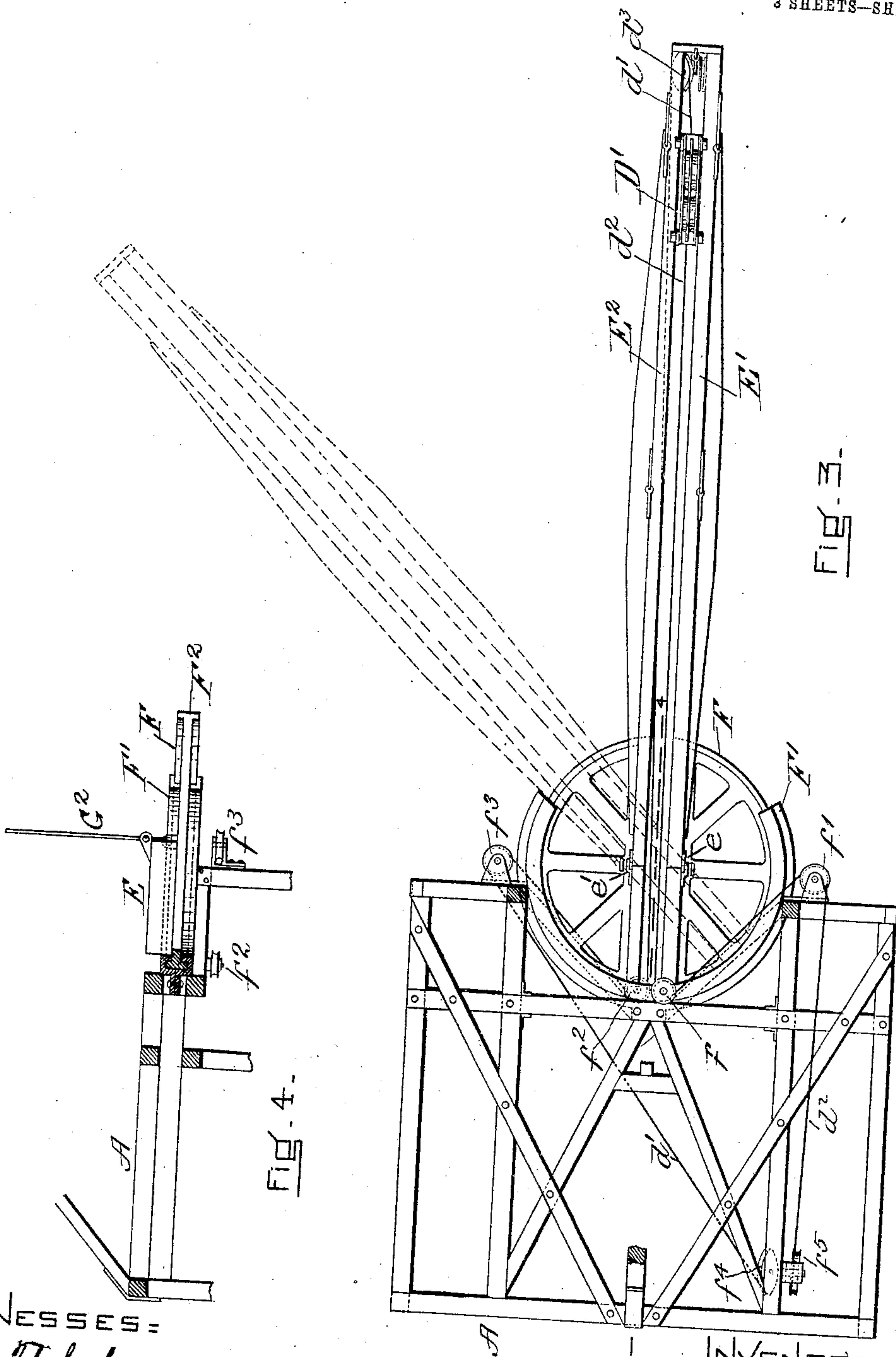
No. 814,271.

PATENTED MAR. 6, 1906.

J. CAMPBELL.
APPARATUS FOR HANDLING COAL, &c.
APPLICATION FILED JAN. 14, 1905.

APPLICATION FILED JAN. 14, 1905.

3 SHEETS--SHEET 3.



WITNESSES:-
H. C. Flaherty
W. V. Foley

INVENTOR=
Jimmie Campbell
By his attys-
Clarke, Raymond & Cole

UNITED STATES PATENT OFFICE.

JEREMIAH CAMPBELL, OF PROVIDENCE, RHODE ISLAND.

APPARATUS FOR HANDLING COAL, &c.

No. 814,271.

Specification of Letters Patent.

Patented March 6, 1906.

Application filed January 14, 1905. Serial No. 241,088.

To all whom it may concern:

Be it known that I, JEREMIAH CAMPBELL, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in Apparatus for Handling Coal and other Like Uses, of which the following is a specification.

My invention relates to towers and similar structures wherein there is employed a boom which serves by means of a trolley or similar device either as a guide for a hoisting-rope or as a support therefor. In the form of my invention shown in the drawings the boom is constructed to support a trolley, and the peculiarity of my invention lies in the fact that the boom is capable of a horizontal movement about an axis, so that the shovel or bucket may be brought within reach of a load to be handled or may have a greater reach in dumping a load than has heretofore been possible.

My invention will be understood by reference to the drawings, in which—

Figure 1 is a side sectional elevation of a tower embodying my invention, Fig. 2 being an enlarged front sectional elevation thereof, a portion of the tower being omitted. Fig. 3 is a horizontal section on line 3 3 of Fig. 1, and Fig. 4 is a sectional detail taken on line 4 4 of Fig. 3.

The details of the structure which form the tower, as shown in the drawings, are somewhat conventionalized, for the reason that the tower may be constructed in any one of a number of well-known ways as a support for the boom, which forms, primarily, the substance of my invention.

A represents the framework of the tower, on which is the engine-room B, containing engines C and D. A truss C' is mounted on top of the tower and is supported in a forwardly-projecting position by braces C². The truss C' carries a pulley c', fixedly attached thereto, and from its top hangs a second pulley c², attached thereto by a swivel, so that its position may conform to the direction from which the hoisting-rope is coming. The grab-hoisting rope is marked c. It passes from the drum of the hoisting-engine C over the sheaves of pulleys c' c² and down between the rolls d d of the trolley D' and carries at its lower end a grab or bucket. (Not shown.) The trolley D' runs backward and forward upon the boom E, being moved thereon by means of ropes d' d², which are preferably but

a single rope, the middle portion of which is wound on the drum of the hoisting-engine D, its ends being attached to the two ends of the trolley in the usual manner, the intermediate parts of the rope passing over various sheaves, as will be explained below.

The boom E is of ordinary construction—that is, to the extent of comprising two rails E' E², clamped together at their outer ends and hinged as at e e' near their inner ends, so as to be capable of being lifted out of the way, the outer ends being suspended by guys G G' and separated to allow the hoisting-rope to pass between them as the trolley moves out and in. To lift the outer end of the boom, it is provided with a suitable eye e³, from which runs a hoisting-rope e⁴ over a pivotally-mounted pulley e⁵, supported above the top of the truss C' and running down over suitable guiding-pulleys to a drum upon one of the engines C in the engine-room.

The inner end of the boom is attached to the wheel F, which is mounted in a circular trackway F', supported on the tower so that the boom may be turned in any direction in a horizontal plane. This forms what may be termed a "supporting means" for the boom. Above the level of the trackway are pulleys f f', the pulley f being attached to the wheel and the pulley f' being attached to the beam on the tower, and below the level of the trackway attached to suitable beams on the tower is a sheave f³. A sheave f² is attached to the under side of the wheel. The end d' of the trolley-rope runs from the front end of the trolley around a sheave d³ at the outer end of the boom and then around the sheaves f², f³ and a guiding-sheave f⁴ to the trolley-moving engine, the end d² of the rope being attached to the inner end of the trolley and running over the sheaves f f' and over a guiding-sheave f⁵ to the drum of the trolley-moving engine. By this means the trolley may be moved in or out as desired; but in order that it may be brought way inboard and over a hopper located as shown at H, I prefer to make the wheel F slotted—that is, to cut away its rim, as at F², for a distance equal to the width of the passage between the beams E' and E², so that the trolley may pass within the circumference of the wheel, carrying its load depending through it, and, as shown, this passage so formed runs to the extreme rear of the wheel for the purpose of giving as long a movement to the trolley as is possible. To further steady the

various parts, I provide a yoke g , which is hung, by means of a swivel connection, from plates g' , attached to the truss C' . Connected with these plates also is an eyepiece g^2 , to which the upper ends of the guys G G' are attached. These guys assist in supporting the boom E , as above explained, and are preferably made of wire rope, being connected to the boom E at g^2 g^3 , respectively. From the ends of the yoke g guys G^2 extend downward and are attached to the wheel F at g^4 g^4 on each side of the beams E' E^2 upon one of the diameters of the wheel, this construction being such that the boom E may be moved freely in either direction without interfering with the arrangement of the guy-ropes, which are provided for by the various swivels above referred to, and also without interfering with the trolley-moving ropes, and it is this latter feature which forms an important part of my invention, the purpose of which, as indicated, is to cause the trolley-ropes to pass from the trolley to pulleys located in a fixed place and always guide them to the engine from a given direction, irrespective of the position of the boom.

In practice a barge being brought to a convenient position alongside the tower under the boom the grab or bucket would be lowered into one of the hatches of a barge—say the forward hatch. When the portion of the barge under that hatch has been emptied, the boom may then be turned as shown in dotted lines in Fig. 3, so that it will lie above the next hatch and the portion of the cargo which can be reached from that hatch can then be hoisted. Thereafter, if necessary, the barge can be moved into a more convenient position within reach of the trolley and bucket. The construction shown is such that the boom when in use will always extend outward radially from a center about which it may be turned and which is approximately over the hopper, and the means for supporting the boom are such as not to interfere with the trolley being brought in to the center about which the boom turns when about to dump its load.

While I have used the terms "wheel" and "slotted wheel," I do not mean to limit myself specifically to what is ordinarily known as a "wheel"—that is, a structure having a substantially complete circumference, but to describe thereby a structure which forms a bearing upon which the boom may be supported to turn about an axis and which may not interfere with the inward movement of the trolley. The boom, moreover, as shown, is so mounted that its outer end may be raised, being thus turned about a horizontal axis as well as a vertical axis. It is this general construction in which, broadly speaking, my invention lies; but I do not mean to limit myself to its details, as it can be embodied in a variety of constructions.

I have used the term "truss" to describe the part C' ; but I do not mean by this that the part should be necessarily anything more than a simple beam.

What I claim as my invention is—

1. In a coal-handling apparatus, in combination with a trolley, a hoisting mechanism and a trolley a track for the same operating mechanism, a boom, and means for supporting said boom whereby it may be turned about a vertical axis, said trolley-track being extended across the axis of the boom, as set forth.

2. In a coal-handling apparatus, a boom, means for supporting it at one end thereof whereby it may be turned on a vertical axis, said boom being provided with a longitudinal slot and said supporting means being provided with a slot registering with the slot in said boom, as described.

3. In a coal-handling apparatus, a boom, means for supporting it whereby it may be turned on a vertical axis, said boom being provided with a longitudinal slot and said supporting means being provided with a slot registering with the slot in the boom, in combination with a trolley adapted to run on said boom, and hoisting mechanism adapted to run through said trolley and said slot in said boom, as described.

4. In a coal-handling apparatus having a trolley, and a hoisting-rope adapted to reeve therethrough, a slotted boom adapted to support said trolley, means for supporting said boom whereby it may be turned in a horizontal plane, said means comprising a slotted wheel, the slot whereof registers with the slot in said boom, as described.

5. In a coal-handling mechanism, a boom, a trackway, a wheel located in said trackway, said boom being attached to said wheel, a swivel-support and guys, the lower ends of said guys being attached to said boom and the upper ends being hung from said swivel-support, as set forth.

6. In a coal-handling apparatus, a boom, means for supporting it, a trolley adapted to run on said boom, means for moving said trolley comprising an engine, ropes running from said trolley to said engine, and pulleys located to guide said ropes, two pulleys being located in rear of the boom and adapted to receive the ropes from said trolley, and two pulleys being located in front of said first-named pulleys and on each side of said boom, as and for the purposes set forth.

7. In a coal-handling machine, a boom, a pivotal support therefor intermediate of its length, a trolley-way on said boom extending on both sides of the axis of movement of the boom on its pivot, a trolley to move in said way and a suspender therefrom to carry the load.

8. In a coal-handling machine, a boom, a pivotal support therefor intermediate of its

length, a trolley-way on said boom extending on both sides of the axis of movement of the boom on its pivot, a trolley to move in said way and a suspender therefrom to carry the load, said boom being slotted below, and for the length of, the track to permit of the movement of the suspender therein.

9. In a coal-handling machine, a boom, a support therefor intermediate of its length, upon which the boom is pivoted to have movement in a vertical plane, a trolley-way on said boom extending on both sides of the axis of movement of the boom on its pivot, a trolley to move in said way and a suspender therefrom to carry the load.

10. In a coal-handling machine, a boom, a support therefor intermediate of its length, upon which the boom is pivoted to have movement in a horizontal plane, a trolley-way on said boom extending on both sides of the axis of movement of the boom on its pivot, a trolley to move in said way and a suspender therefrom to carry the load.

11. In a coal-handling machine, a boom, a support therefor intermediate of its length, upon which the boom is pivoted to have movement in horizontal and vertical planes, a trolley-way on said boom extending on both sides of the axis of movement of the boom on its pivot, a trolley to move in said way and a suspender therefrom to carry the load.

12. In a coal-handling machine, a boom, a support therefor intermediate of its length, upon which the boom is pivoted to have movement in horizontal and vertical planes, a trolley-way on said boom extending on both sides of the horizontal axis of movement of the boom on its pivot, a trolley to move in said way and a suspender therefrom to carry the load.

13. In a coal-handling machine, a boom, a pivotal support therefor intermediate its length, said support comprising a circular way or bearing, blocks on the one hand engaging said way on either side thereof and on the other hand engaging said boom on either side thereof, a trolley-way on said boom extending on either side of the axis of said pivotal bearing, a trolley to move in said way, and a suspender therefrom to carry a load.

14. In a coal-handling machine, a boom, a pivotal support therefor intermediate its length, said support comprising a circular way or bearing, blocks on the one hand engaging said way on either side thereof, and on the other hand engaging said boom on either side thereof, a trolley-way on said boom extending on either side of the axis of said pivotal bearing, a trolley to move in said

way, and a suspender therefrom to carry a load, said boom and circular bearing being slotted below the trolley-way to permit of the movement of the suspender therethrough.

15. In a coal-handling machine, a boom, a pivotal support therefor intermediate its length, said support comprising a circular way or bearing, blocks engaging said way on either side thereof, journals on either side of said boom, and bearings on said blocks engaging said journals, a trolley-way on said boom, extending on either side of the axis of said pivotal bearing, a trolley to move in said way and a suspender therefrom to carry a load.

16. In a coal-handling machine, a boom, a pivotal support therefor intermediate its length, said support comprising a circular way or bearing, blocks engaging said way on either side thereof, journals on either side of said boom, and bearings on said blocks engaging said journals, a trolley-way on said boom, extending on either side of the axis of said pivotal bearing, a trolley to move in said way and a suspender therefrom to carry a load, said boom and circular bearing being slotted below the trolley-way to permit of the movement of the suspender therethrough.

17. In a coal-handling apparatus, a boom, means for supporting it to turn about a vertical axis, a trolley on said boom, means for moving said trolley comprising an engine, ropes running from said trolley to said engine, and pulleys located to guide said ropes, two pulleys being located on said boom-supporting means in rear of its vertical axis and adapted to receive the ropes from said trolley and two pulleys being located in front of said first-named pulleys and on each side of said boom as described.

18. In a coal-handling apparatus, a boom, means for supporting it to turn about a vertical axis, a trolley on said boom, means for moving said trolley comprising an engine, ropes running from said trolley to said engine, and pulleys to guide said ropes, two pulleys being located in rear of the vertical axis of said boom to move with said boom and two pulleys being located in a fixed position in front of said axis, said ropes leading from the trolley around said rear pulleys and to the engine whereby said ropes will always lead to the engine from the same angle irrespective of the position of the boom as described.

JEREMIAH CAMPBELL.

In presence of—

GEO. O. G. COALE,
M. V. FOLEY.