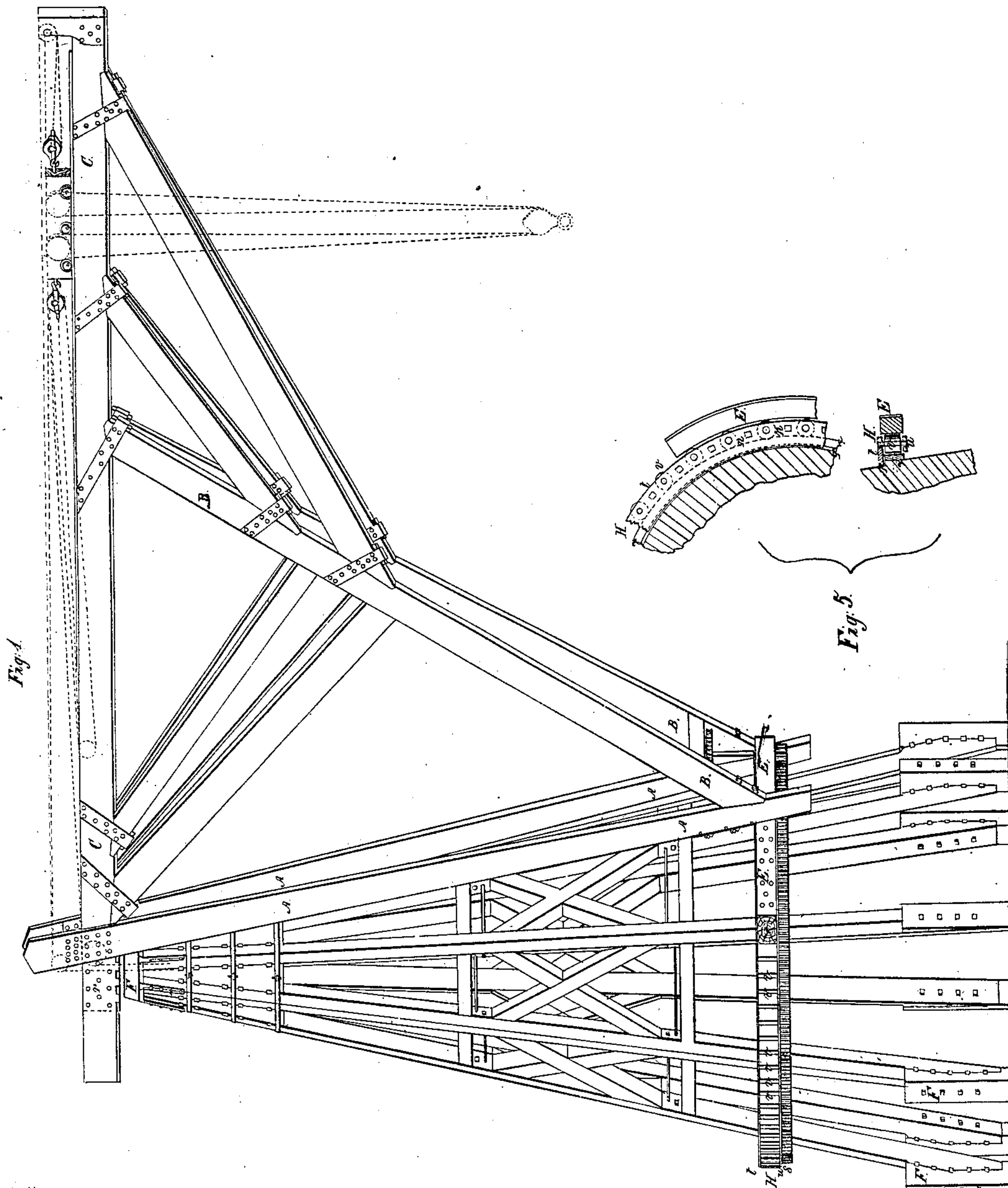


B. J. Burnett,

Derrick.

No 13,976.

Patented Dec. 25, 1855.



Witnesses:

J. M. Stratton
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Inventor:

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UNITED STATES PATENT OFFICE.

B. J. BURNETT, OF NEW YORK, N. Y.

CRANE.

Specification of Letters Patent No. 13,976, dated December 25, 1855.

To all whom it may concern:

Be it known that I, BENIJAH J. BURNETT, of the city, county, and State of New York, have invented a certain new and useful Improvement in Cranes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form part of this specification, and in which—

Figure 1 represents a side elevation of the crane; Figs. 2, 3 and 4, views, on an enlarged scale, of the upper sleeve or journal arrangement at the top of the tower which serves to take the whole vertical pressure or weight of the swinging jib and its parts with the load, or any other top journal arrangement may be used; Fig. 5 represents a plan and cross section of the circular horizontally traveling roller frame, showing its arrangement and operation with the jib traveler around the tower, in part.

Diversified as have been cranes in their construction and arrangement of parts, they have not in a general way been considered safe, cheap enough or practicable for many descriptions of work, especially where the construction of large works is concerned and in the lifting, lowering, swinging or moving about of heavy goods, such as the bed-plates and so forth of the larger kinds of marine engines, putting the same in or out of the vessel, and so forth, to do which "sheer-poles" have been employed but they strain the ship and the operation of such is necessarily slow and expensive, while "boom derricks" are too complicated, too irregular or unreliable as regards the distribution of the strain and very liable to accident or breakage by reason of the number of rods and parts they are made up of and unevenness of the strain on those parts. A crane therefore simple in its build or of few parts and that may be made capable of operation with facility and despatch for the heaviest as well as the lighter description of work, is a desideratum, to effect which it is necessary that the jib with its immediate accompaniments or parts and load should be borne vertically on the top of the post or tower exclusively, this is a correct principle, and I employ it, but there are other requirements necessary in conjunction, which it is the object of my invention to attain.

In the crane represented in the accompanying drawings, a strong pyramidal tower is used to take the place of the ordinary vertical post. The jib (C) with its

several braces and parts, as will be hereinafter explained, is supported vertically on the top of this tower and allowed of free horizontal swing thereon by means of a cast iron or other metal cap (F), Fig. 1, formed with a sleeve (d), Fig. 3, flange (e) and groove (K), the whole of which may be denominated the "sleeve cap," seated on the top of the tower, and operating in connection with which is a "sleeve journal" (G) having an inner sleeve (i) and circular tongue or projection (h). To this latter casting or part—the "sleeve-journal"—the jib or jibs (C) of the crane are attached and the crane rope or chain passes down within the inner sleeve (i) as is common to other cranes, or this top carrying journal may be otherwise and differently constructed.

To secure the full advantage, without restriction of any kind or extent, of sustaining and operating the crane from or on, exclusively, the top of the tower, and prevent the "tripping out" sidewise or tendency so to do of what is usual to term the "horizontal traveler" below, I deem it advisable to restrict this horizontal traveler (E) to occupy only a segment of a circle and not to extend all around so that there shall be no "binding," "twisting" or turning up of it, and freely to suspend the said segmental traveler from the jib (C) by connecting it therewith by main braces (B) and backstays (A), both of which are arranged to spread outward, or apart, from the jib downward—that is the two or more pieces or timbers making up the duplicate main braces and backstays—so as to perfectly balance the traveler (E), as well as suspend it at their feet or lowest and widest spread ends, whereby all tripping out sidewise, or tending so to do, of the horizontal traveler (E) is effectually prevented, while its free suspension from the top of the tower and exemption from all vertical or lateral binding is secured; thus, in this construction and arrangement, there is something more than the mere suspension of the jib and its load from or on the top of the tower, to which thing alone I here lay no claim.

The next joint to arrange to secure an easy and steady operation is to provide for the lateral or horizontal strain or pressure of the foot of the crane, which in this case is the segmental traveler (E), which may reach to within about twelve feet, more or less, from the base of the tower. To get an easy run of this traveler (E) horizontally, in swinging the jib together with its load,

without interfering with the balance and free suspension of the traveler from the top of the tower by the spreading main braces and back-stays as specified, and with exemption from all vertical binding whatever of the traveler, would appear to be easily obtained and with very little friction by causing the traveler to rest against and work around a circle of vertical anti-friction rollers arranged to run freely on their axes, but otherwise stationary, as in common to other bearings, both lower crane post journals and others, where horizontal pressure has to be sustained. Anti-friction rollers thus arranged or, what is equivalent, hung in the traveler and bearing against the post or tower but similarly operating to reduce friction, are inapplicable to cranes having very heavy work to perform, such as I have before referred to, as proved to me by actual experiment, the journals of the friction rollers—though made as stout as practicable to secure an easy run—being so liable to get bent thereby interfering with the run of the rollers, and in some instances actually crushed and broken, by the excessive horizontal pressure or weight thrown upon them by the jib and its load. To obviate this difficulty, I employ, in connection with the segmental traveler (E), a horizontal circular revolving frame (H) of vertical rollers (v), arranged as follows. The circular revolving frame (H) is made up of two rings (t and u) horizontally parallel to each other and connected together by pins or brackets (n—Fig. 5). These rings (t and u) encircle the tower as represented in Fig. 1, and the upper ring (t) which is of smaller internal diameter than the lower ring rests upon a circular way (r—Fig. 5), built in, on or around the tower, so that the whole weight of the circular frame (H), with its vertical rollers (v) arranged within and around it, carried by the upper ring resting on the tower. This circular frame of rollers is loosely seated on the tower, but is backed as it were—though the parts are distinct from each other—by a ring or belt of iron (x—Fig. 5) spiked or otherwise firmly secured to and around the tower between the rings (t and u). This hoop or belt (x) serves as an inner surface for the rollers (v) to bear against as the frame (H) is moved around the tower the rollers (v) projecting beyond the rings (t and u) on the outer periphery of the circular traveling frame (H) and the segmental traveler (E) pressing on the outside against the rollers (v).

Now it will be obvious that by this arrangement all horizontal crushing pressure of the jib and its load is borne by the bodies of the rollers on or against the stationary ring or belt (x) which encircles the tower and is firmly secured to it, and none of the

said pressure is met or borne by the journals of the rollers which, no matter what the pressure therefor, preserve their true run, all bending or crushing of the journals of the rollers is consequently avoided. In swinging around the jib with its load, the segmental traveler (E) runs against the rollers (v) on the outside and in turning segmental traveler (E) rubs against the stationary metal belt (x) and so to carry around the whole circular frame (H) of rollers on the journals of which no more lateral pressure is thrown or felt than is due to the turning of the loose or free circular frame (H) by the creeping of the rollers around the stationary metal belt (x), while all vertical pressure at the foot of the main brace which supports the jib is transferred altogether to the top of the tower and in no way affects the easy run of the circular frame (H) which takes its bearing or rests on the circular way of the tower and has only its own weight and that of its rollers—all hung or suspended as it were from the tower—to carry. In this manner a comparatively frictionless and stable arrangement is provided to meet the specified horizontal pressure however heavy the same may be. The swinging around of the crane may be accomplished by gear or otherwise in any suitable manner.

What I claim as new and useful herein, and desire to secure by Letters Patent, is—

1. The pendant segmental traveler (E) freely suspended and balanced from the jib and top of the tower by means of the main braces (B) and backstays (A) arranged to spread outward from toward the top downward as shown and described, and whereby the "tripping out" or lateral displacement of the foot of the crane or segmental traveler (E) is obviated, all twisting or binding avoided and a perfectly free but steady action given the same either as regards pressure in the vertical direction transferred to the top of the tower or horizontal swing, as herein set forth.

2. The combination and arrangement, with the segmental traveler (E) or swinging foot of the crane, of the circular or revolving frame (H) of anti-friction rollers freely suspended on the tower and rotating around the same, together with the swinging foot or segmental traveler by the horizontal pressure of the latter on the rollers in concert with their bite on or against the fixed belt surrounding the tower, substantially as shown and described and for the purposes set forth.

In testimony whereof, I have hereunto subscribed my name.

B. J. BURNETT.

Witnesses:

WM. M. SMITH,
A. GREGORY.