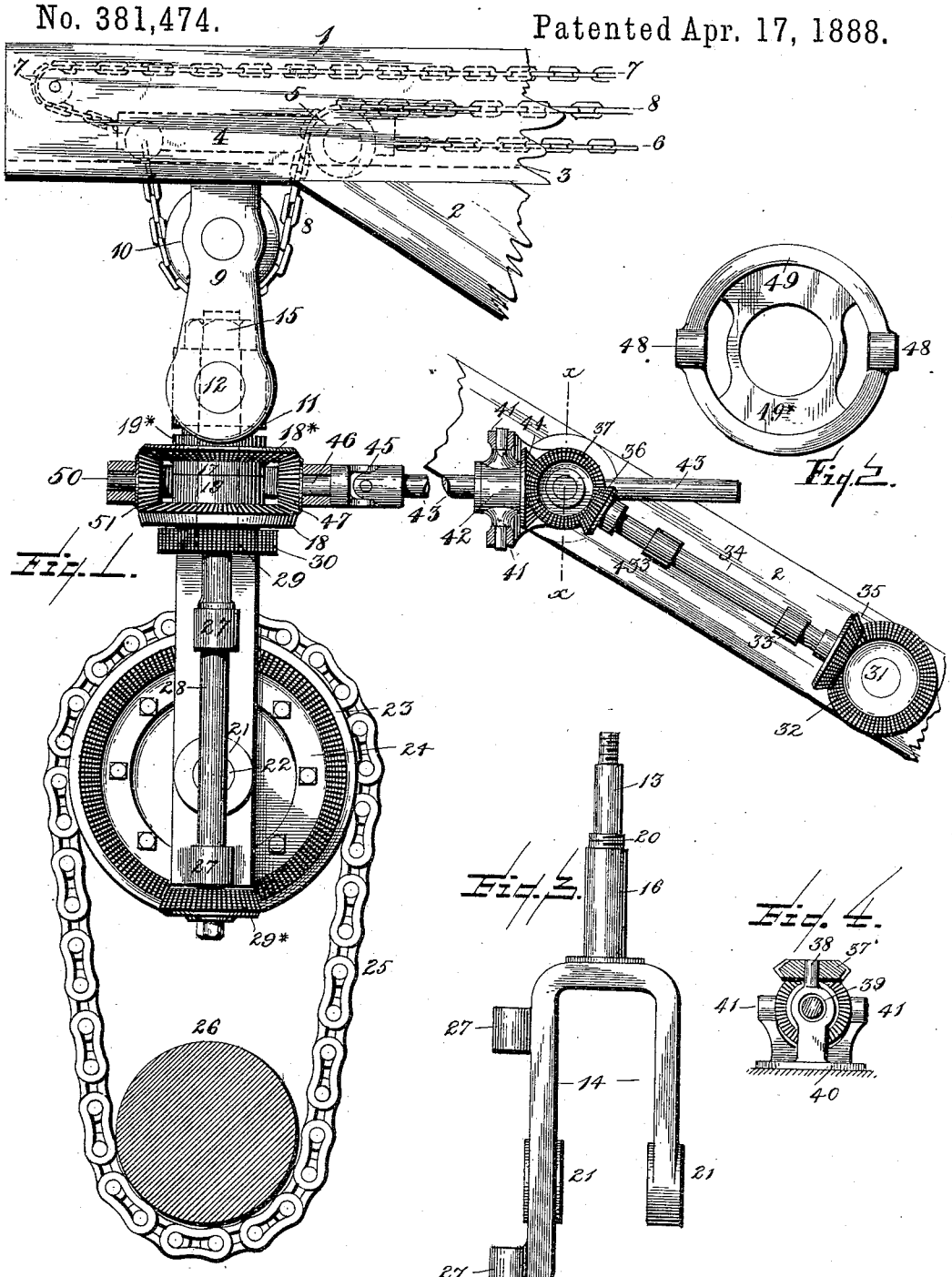
(No Model.)

L. F. JOHNSON.

DEVICE FOR HANDLING HEAVY MASSES OF METAL.

No. 381,474. Patented Apr. 17, 1888.



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DEVICE FOR HANDLING HEAVY MASSES OF METAL.

SPECIFICATION forming part of Letters Patent No. 381,474, dated April 17, 1888.

Application filed January 25, 1888. Serial No. 261,854. (No model.)

To all whom it may concern:

Be it known that I, LUMAN F. JOHNSON, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga, State of Ohio, have invented certain new and useful Improvements in Devices for Handling Heavy Castings, of which the following is a specification, reference being had therein to the accompanying drawings.

The object of this invention is to provide a strong and convenient device to be attached to cranes and derricks for presenting in different positions for the operation of a steam-hammer heavy forgings and ingots—such as, for instance, armor-plates, ordnance, &c.; and the invention consists in certain features of construction hereinafter described.

Referring to the drawings, Figure 1 is a side elevation showing the jib of a crane provided with a device constructed in accordance with my invention. Fig. 2 is a detail in plan of a gear-supporting ring. Fig. 3 is a detail in side elevation of a pulley-supporting sheaf or yoke, and Fig. 4 is a transverse section on the line *x x* of Fig. 1.

Similar figures of reference indicate similar parts in all the figures of the drawings.

1 represents the jib of a crane, which is supported in position by means of a diagonal stay, 2. The jib 1 is in this instance provided with the usual oppositely-located tracks, 3, upon which is mounted for travel an ordinary trolley, 4, carrying a central pulley, 5, these parts being shown in dotted lines, Fig. 1.

6 and 7 represent the chains for moving the trolley upon the track 3, and 8 represents the draft-chain for supporting the sheave 9, having the pulley 10, the opposite end of the chain 8 being secured at one end to the trolley 4. It will be understood that these chains 6, 7, and 8 are connected with suitable operating-drums at the foot of the mast. (Not shown.)

11 represents a cross-head mounted between the sheaves 9 at their lower ends by means of trunnions 12. The cross-head 11 is vertically bored, and receives the upper spindle, 13, of a yoke, 14, said spindle being provided with a nut or other securing device, 15. Intermediate the spindle 13 and its depending hanger or yoke 14 is formed a bearing, 16, upon which is mounted for rotation collars 17 and 19, having oppositely-arranged inner-faced gears 18* and 18, respectively. A screw-threaded ring, 19*, is mounted above the collar 17 upon screw-threads 20, formed upon the bearing 16 at its upper end, which ring serves to prevent the collar from rising from its seat in the bearing 16.

The yoke 14 is formed with oppositely-arranged bearings 21, in which is mounted a shaft, 22, carrying a loose pulley, 23, having a beveled facial gear, 24, bolted to one side thereof. Over this pulley is loosely suspended a suitable chain, 25, which depends a suitable distance below the pulley and supports, in this instance, one end of a shaft, 26. One of the arms of the yoke 14 is provided with vertically-opposite bearings 27, in which is loosely mounted a shaft, 28, carrying at its lower end a bevel-gear, 29*, meshing with the facial gear 24 of the pulley 23, and at the opposite end of the vertical shaft 28 is an ordinary gear, 29, which meshes with a larger gear, 30, formed upon the lower end of the collar 17 and below the bevel-gear 18 thereof.

In this instance there extends transversely through the diagonal stay 2 a transverse shaft, 31, which is connected with any suitable motor or engine (not shown,) which is provided with a bevel-gear, 32, which is fast thereon. Mounted in bearings 33, projecting from the stay 2, is a shaft, 34, carrying at its lower end a bevel-gear, 35, which meshes with the gear 32. At the opposite or upper end of the shaft 34 is a second gear, 36, which meshes with a similar gear, 37, mounted upon a shaft, 38, transversely perforated, as at 39, and projecting from a plate, 40, which is pivoted to the face of the stay 2. The plate 40 is formed with oppositely-located bearings 41, in which is pivoted a shaft-supporting hanger, 42, through which passes a shaft, 43, upon which is splined a bevel-gear, 44, which meshes with the gear 37, mounted upon the shaft 38, the shaft 43 passing through the opening 39 formed in the shaft 38.

Connected to the shaft 43 by a gimbal-joint, 45, is a short shaft, 46, having at its opposite end a bevel-gear, 47, which is mounted in a bearing, 48, of a supporting-ring, 49, for mesh with the two inwardly-disposed bevel-gears 18. The ring 49 has opposite bearings, 48,

one of which, as before described, supports the shaft 46, the opposite bearing, 48, supporting a short shaft, 50, having a gear, 51, similar to the gear 47, the gear 51 meshing with the gears 18 in a like manner to the gear 47 and to the opposite side thereto, the ring being supported upon the collars 17 and 19 by means of a perforated web, 49*, formed therein, through which the collars pass.

The operation of my invention is as follows: Motion imparted to the gear 32 through the medium of the shaft 31, which is connected with any suitable motor, is transmitted to the gear 35, its shaft 34, and to the gear 36, and from thence to the double gear 37 and the gear 44, which latter gear, being splined upon the shaft 43, transmits motion thereto and to the gear 47, which rotates the gear 18* in one direction and the gear 18 in the opposite direction. The gear 18, being formed upon the same collar as the gear 30, said latter gear thereby receives motion and imparts the same to the pinion 29, its shaft 28, and its lower gear, 29*, and the latter gear imparts motion to the loose pulley through the medium of the facial gear 24, secured thereto, and thus the chain 25 is rotated and the presentation of the forgings supported therein in different positions under a steam-hammer is accomplished.

The gear 18* is simply an idle-gear, and, in connection with the bevel-gear 51, prevents any buckling or tendency of the shaft 43 to follow the gear 18 when any unusual strain is exerted.

I do not limit my invention to any particular train of gearing for operating the same, but hold that I may vary the same in any manner desired.

By means of the chain 8 the device as a whole and its supported work may be adjusted laterally, in which case the shaft 43, its gear 44, and support 41 turn upon the pivot by which it is secured to the stay 2.

In all horizontal adjustment by means of the trolley 4 and its chains 7 and 6, the shaft 43, being splined to the gear 44, slides horizontally therein.

Having described my invention and its operation, what I claim is—

1. In combination with the jib of a crane, a loosely-suspended pulley having a chain depending therefrom, and mechanism for rotating said pulley, substantially as specified.

2. In combination with the jib of a crane, a loosely-suspended swiveled pulley having a chain mounted thereon, and means for rotating said pulley, substantially as specified.

3. The combination of the jib of a crane with hangers depending therefrom, a yoke swiveled in said hangers, a pulley loosely mounted in said yoke, and means for operating said pulley, substantially as specified.

4. The combination, with the jib of a crane, of hangers connected therewith, a yoke swiveled in said hangers and carrying gears, and having a loose pulley mounted therein, and means, substantially as described, for giving motion to said gears and from thence to the pulley, substantially as specified.

5. The combination of the jib of a crane with a hanger adjustably connected therewith, a yoke swiveled in said hanger and provided with a loose pulley carrying a depending chain, and a train of gearing leading from a motor to said pulley for operating the latter, substantially as specified.

6. In combination with the jib of a crane, a loosely-suspended hanger carrying a swiveled yoke provided with a pulley, a chain depending therefrom, gears mounted on said yoke, and mechanism, substantially as shown and described, for transmitting motion to said gears and pulley, substantially as specified.

7. The combination, with a jib having a trolley mounted thereon, of a vertically-adjustable hanger connected to said trolley, and a swiveled yoke mounted in said hanger and carrying a loose pulley having a depending chain, substantially as specified.

8. The combination of the jib of a crane with a loosely-suspended hanger provided with a casting-suspending device, and mechanism for rotating said device, substantially as specified.

9. The combination, with the jib having loosely-suspended hangers, of a yoke swiveled therein provided with gears of a sliding shaft geared to said gears, and mechanism for rotating said shaft, substantially as specified.

10. The combination, with hangers having a swiveled casting-supporting device provided with gears, of a flexible sliding shaft having a gear meshing with the first-mentioned gear, and mechanism for rotating said shaft, substantially as specified.

11. The combination, with the jib of a crane, of the hangers 9, chain 8, pulley 10, and block 11, swiveled in said hangers, the yoke 14, swiveled in said block and carrying the gears 18* and 18 and 30, and the pulley 24, having the chain 25, the vertical shaft 28, having gears 29* 29, mounted on said yoke and meshing with said pulley, substantially as specified.

12. The combination, with the hangers 9, having the block 11 swiveled therein, of the yoke 14, swiveled in said block and provided with a fast gear, 19, and a loose gear, 17, the gears 47 and 51 meshing with said fast and loose gears, and the ring 49, having bearings 48 for supporting gears 47 and 51, substantially as specified.

13. The combination of the hanger 14 with the loosely-mounted pulley 23, carrying the chain 25, and having the facial gear 24 secured thereto, substantially as specified.

14. The yoke 14, having bearings 21 27, in combination with the pulley 23, loosely mounted in the bearing 21 and having the facial gear 24 and chain 25, the shaft 28, mounted in bearings 27 and having the gear 29* meshing with said facial gear, substantially as specified.

15. The combination of the plate 40, having the shaft 38, perforated, as at 39, and the opposite bearings, 41, with the double-faced gear

37, mounted on the shaft 38, the pivotal bearing 42, mounted in the bearings 41, and the shaft 43, loosely mounted in the bearing 42 and passing through the opening 39 and carrying the keyed gear 44, which meshes with the gear 37, substantially as specified.

16. The combination of the shaft 31, having the gear 32, with the shaft 34 mounted in bearings 33 and having gears 35 36, the gear 37, mounted on a shaft, 38, the pivoted plate 40, mounted in bearings 41 on said plate, and the shaft 43, mounted to slide in bearings 42, and having the gear 44 splined thereon, substantially as specified.

17. The combination of the sliding shaft 43, having the joint 45 connecting it to the shaft 46, carrying the gear 47, with the ring 49, having the opposite bearing, 48, the shaft 50, mounted therein and carrying the gear 51, and the fast gear 18 and the loose gear 18*, meshing with said gears 51 and 47, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

LUMAN F. JOHNSON.

Witnesses:

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