C. P. KININMONTH.

ELEVATOR.

APPLICATION FILED MAR. 21, 1922.

1,421,787.

Patented July 4, 1922.

3 SHEETS—SHEET 1.

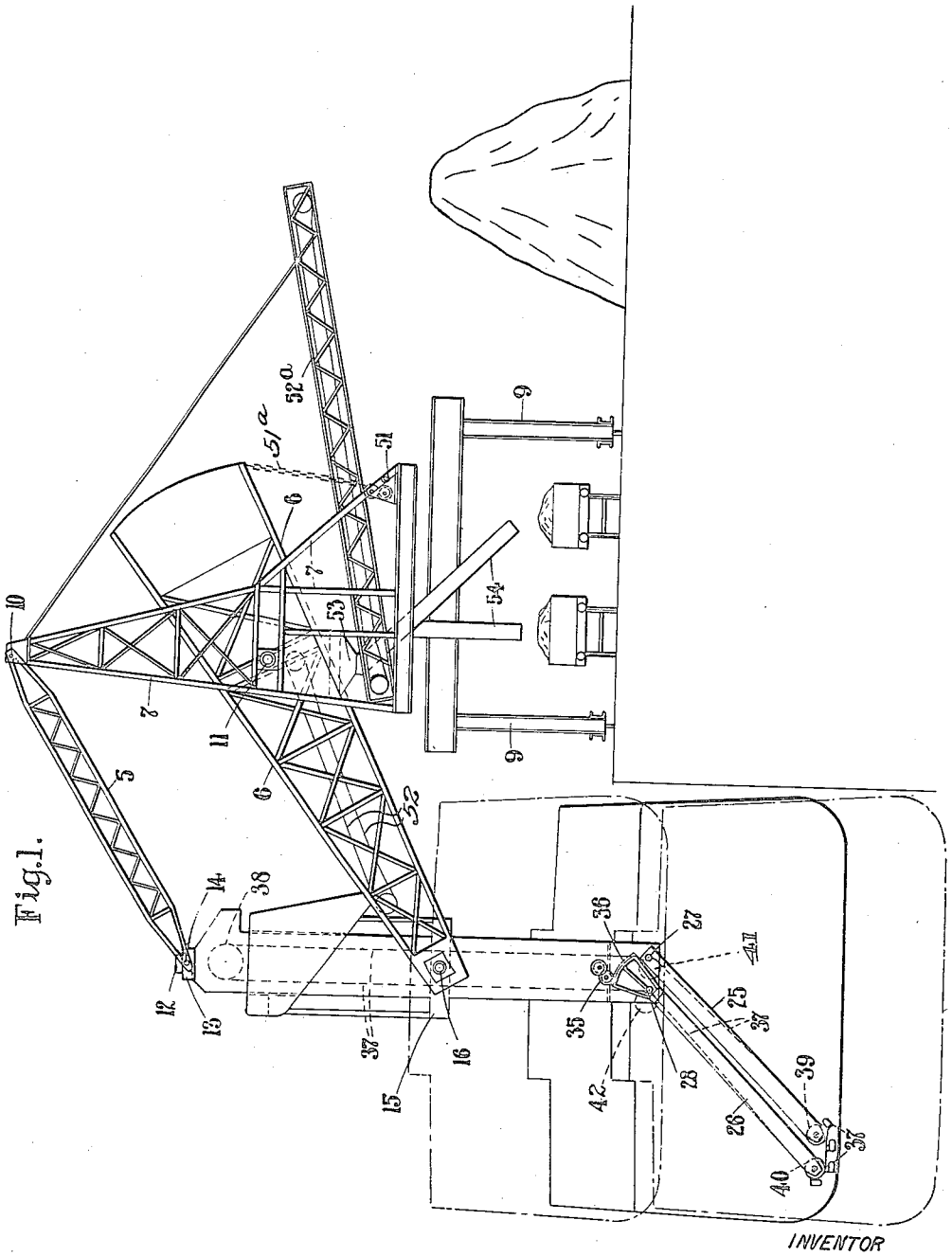


Fig.1.

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3 SHEETS—SHEET 2.

Fig. 2.

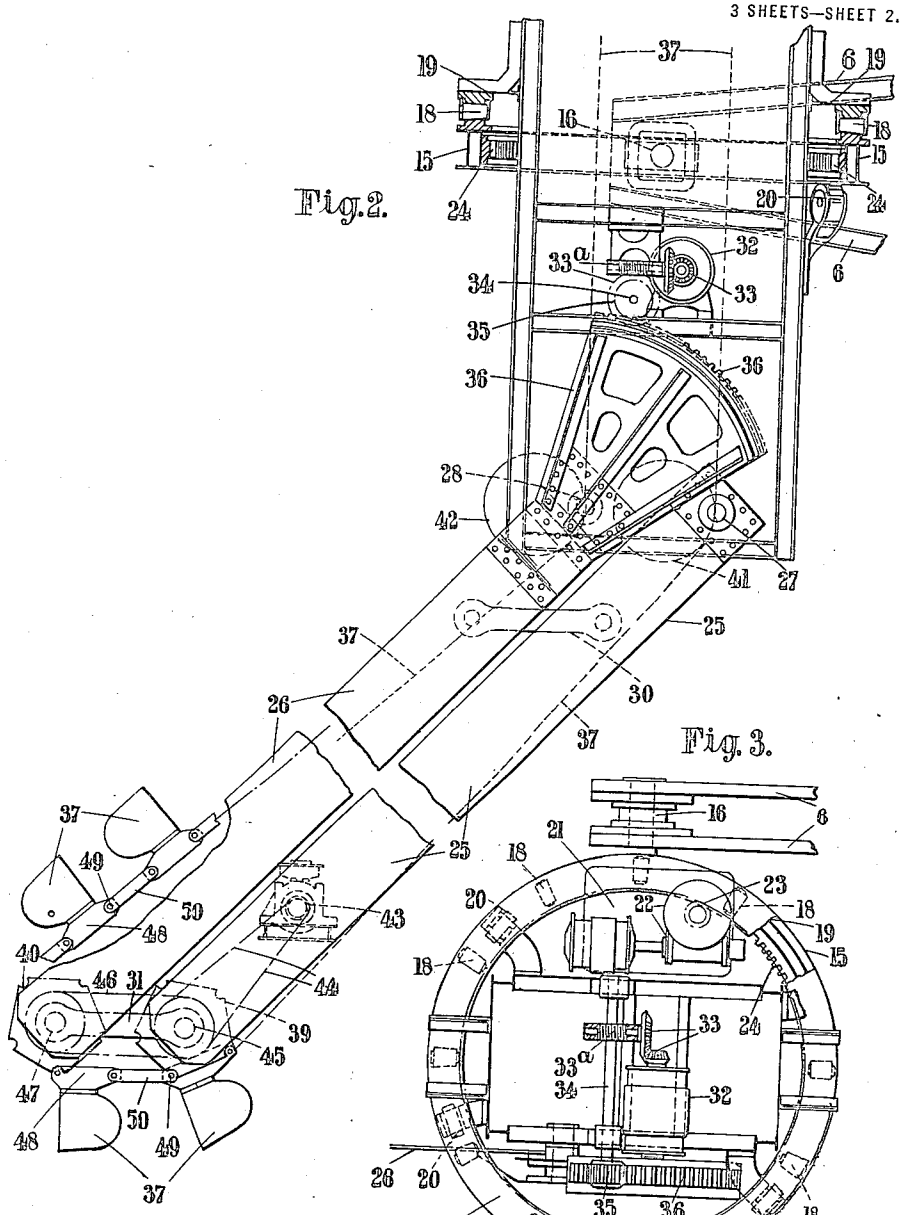


Fig. 3.

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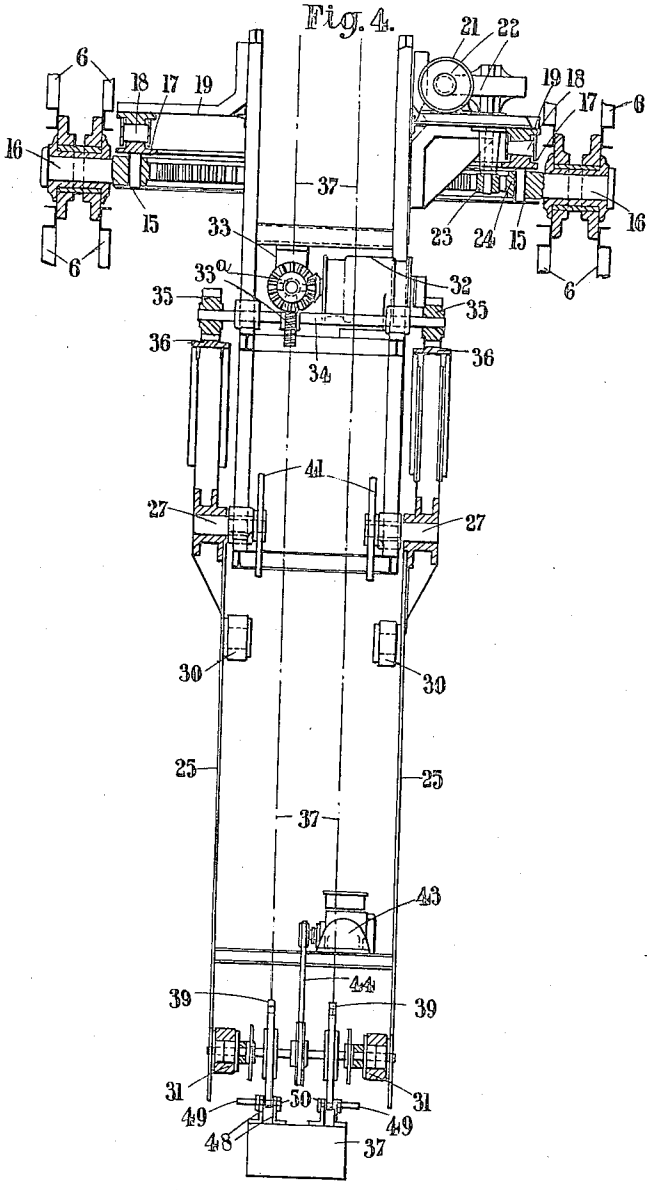
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3 SHEETS—SHEET 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

COLIN PETER KININMONTH, OF MANCHESTER, ENGLAND, ASSIGNOR TO HENRY SIMON LIMITED, OF MANCHESTER, ENGLAND.

ELEVATOR.

1,421,787. Specification of Letters Patent. Patented July 4, 1922.

Application filed March 21, 1922. Serial No. 545,579.

To all whom it may concern:

Be it known that I, COLIN PETER KININMONTH, a subject of the King of Great Britain and Ireland, and a resident of Manchester, in the county of Lancaster, England, have invented certain new and useful Improvements in or Relating to Elevators (for which I have filed an application in England, Jan. 27, 1921, application No. 3303), of which the following is a specification.

This invention relates to elevators, and more particularly to bucket and like elevators employed for discharging ore and other bulk cargoes from ships and barges, and it has for its object to provide an improved arrangement or construction of elevator whereby to enable same to pick up material over a wide area and reduce to a minimum manual labour for feeding the material thereto.

According to this invention, a bucket or like elevator is adapted to be adjusted about its longitudinal axis and the lower part of the elevator is adapted to be adjusted about an axis at right angles to said axis.

The accompanying drawings illustrate one construction of elevator in accordance with the invention, and especially applicable for discharging bulk cargoes, such as ores and coal, from ships and barges alongside wharves. In the drawings Fig. 1 is an elevation showing the general arrangement of the elevator, Fig. 2 is a fragmentary elevation to a larger scale and partly in section, Fig. 3 is a sectional plan of Fig. 2, and Fig. 4, is an elevation at right angles to Fig. 2 and also partly in section.

In the construction illustrated, the elevator is suspended from or carried by upper and lower arms 5, 6, arranged parallel-ruler fashion, from a wheeled structure 7 mounted to run at right angles to the edge of the wharf on a structure 9 which may be stationary or be adapted to run on a track along the wharf. The arms 5, 6 are pivoted on the structure 7 at 10, 11 respectively, and are of lattice-girder like construction. The top of the upper portion of the elevator is swiveled at 12 in a crosshead 13 the ends of which are pivoted at 14 in the side members of the upper arm 5.

Between the side members of the lower arm 6 a ring 15 is mounted on trunnions 16 on the upper surface of which ring is provided a track 17 whereon are adapted to run rollers 18 mounted in brackets carried by an external annular flange 19 on the upper portion of the elevator which is encircled by the ring 15. Steadying bowls 20 mounted in brackets on the elevator are adapted to engage the lower face of the ring 15.

The elevator is adapted to be swivelled or angularly adjusted as a whole about the axis of the upper part by means of an electric motor 21 mounted on the flange 19 driving through worm gearing 22 a pinion 23 which gears with a rack 24 provided on the inner periphery of the ring 15.

The lower portion or leg of the elevator is constituted by members 25, 26 pivoted at their upper ends to the upper portion at 27, 28 and connected together by links 30, 31 so as to be capable of angular adjustment parallel-ruler fashion on their pivots 27, 28 whereby the lower portion or leg of the elevator is capable of angular adjustment about an axis at right angles to the axis of the upper portion.

The adjustment of the lower portion or leg of the elevator is effected by an electric motor 32, mounted within the lower part of the upper portion, driving by bevel gearing 33 and worm gearing 33^a a cross shaft 34 carrying pinions 35 gearing with tooth sectors 36 at the upper end of the member 26.

The chain of elevator buckets 37 travels over pulleys 38 (Fig. 1) at the top of the upper portion of the elevator, wheels 39, 40 mounted at the lower ends of the members 25, 26, and idler or guide pulleys 41, 42 mounted at the lower end of the upper portion of the elevator in horizontal line with the pivots 27, 28. The chain of buckets is driven by an electric motor 43 mounted on the member 25, driving by chain gearing 44 the shaft 45 of the wheels 39, the shaft 45 driving by means of chain gearing 46 the shaft 47 of the pulleys 40.

The buckets have secured to them double links 48 of angle iron between the members of which the pulleys 38, 39 and 40 engage the pivot pins 49 whereby the links 48 are connected to the intermediate links 50. The pivot pins 49 are extended beyond the sides of the buckets to co-act with the idler or guide pulleys 41, 42.

If desired, the drive of the chain of buckets from the motor 43 may be through the medium of any known type of hydraulic transmission gear fitted with an automatic

governor to slow down the speed and increase the torque in the event of excessive load, such as e. g. owing to a bucket coming into contact with a large lump of ore, coal or other material.

The elevator may be raised bodily by hauling in a chain 51ª connected to the lower arm 6 by means of a winch 51 on the structure 7, and may be lowered by paying out the chain.

The ore, coal or other material may be discharged from the elevator upon a belt conveyor 52, Fig. 1, whence it may be delivered to a second conveyor 52ª which delivers it outside of the structure 9, or to a hopper 53 wherefrom it passes by chutes 54 to wagons below the structure 9.

By reason of the angular adjustment of the elevator as a whole, and of the lower part or leg thereof, as described, the elevator can operate over a considerable area and can also collect and elevate material from spaces overhung by decks and such like.

What I claim as my invention and desire to secure by Letters Patent is:—

1. In a device of the kind described, a vertical elevator, a parallel motion support for said elevator and having swivelling connection thereto to permit rotation of the elevator on its vertical axis, a leg at the bottom of said elevator including a pair of members pivoted to the elevator and arranged to swing in constant parallel position to each other, and a bucket chain carried by said members and extending at their free ends between the two members.

2. In a device of the kind described, a vertical elevator, a parallel motion support for said elevator and having swivelling connection thereto to permit rotation of the elevator on its vertical axis, a leg including a pair of members independently pivoted to the lower end of the elevator, said pivots having their axes in the same horizontal plane, a link connecting the free ends of said members, each end of the link being pivotally connected to a respective member, chain wheels, having their axes at the pivoted centers of the links, and a bucket chain passing around said chain wheels.

3. In a device of the kind described, a vertical elevator, a parallel motion support for said elevator and having swivelling connection thereto to permit rotation of the elevator on its vertical axis, a leg including a pair of members independently pivoted to the lower end of the elevator, said pivots having their axes in the same horizontal plane, a link connecting the free ends of said members, each end of the link being pivotally connected to a respective member, chain wheels, having their axes at the pivoted centers of the links, a bucket chain passing around said chain wheels, an arcuate rack carried by the upper end of one of said members, a motor on the elevator, and gearing connecting said rack and motor.

In witness whereof I have hereunto set my hand.

COLIN PETER KININMONTH.