

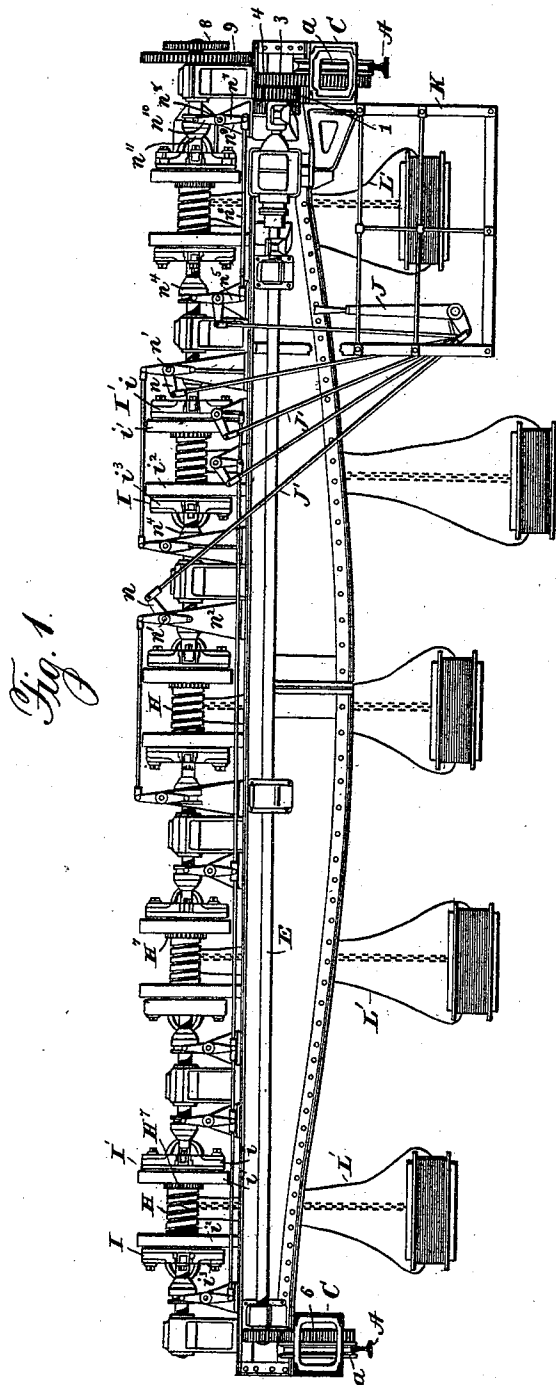
(No Model.)

3 Sheets—Sheet 1.

W. H. MORGAN.
MAGNETIC CRANE.

No. 496,432.

Patented May 2, 1893.



Witnesses

Jas E Hutchinson.

Harry B. Armes.

Inventor

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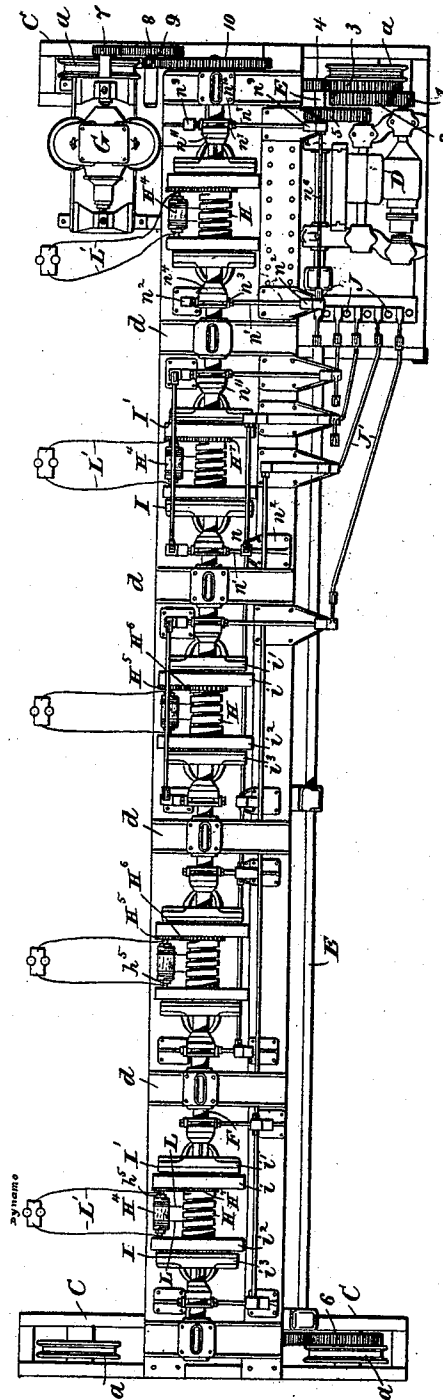
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(No Model.)

3 Sheets—Sheet 3.

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Fig. 3.

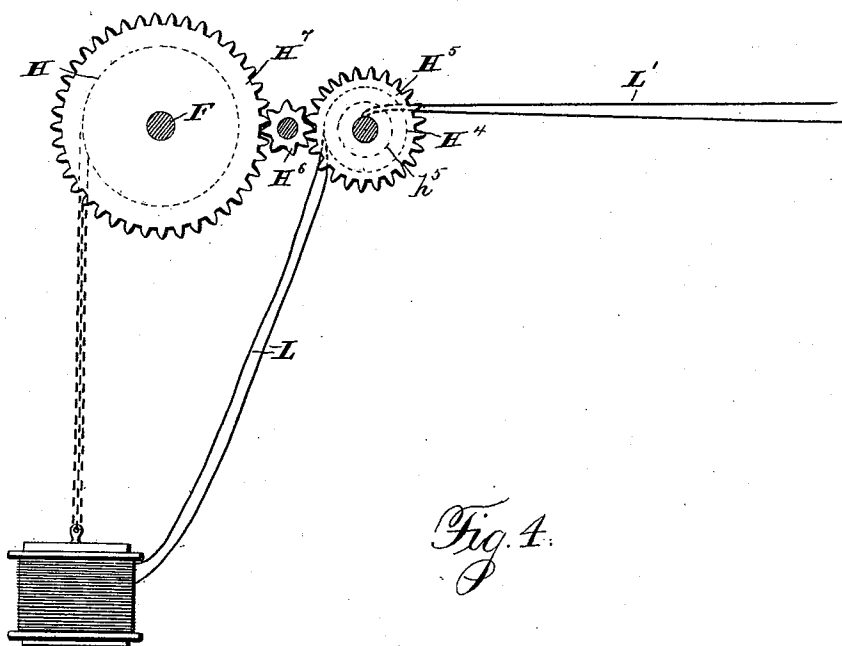
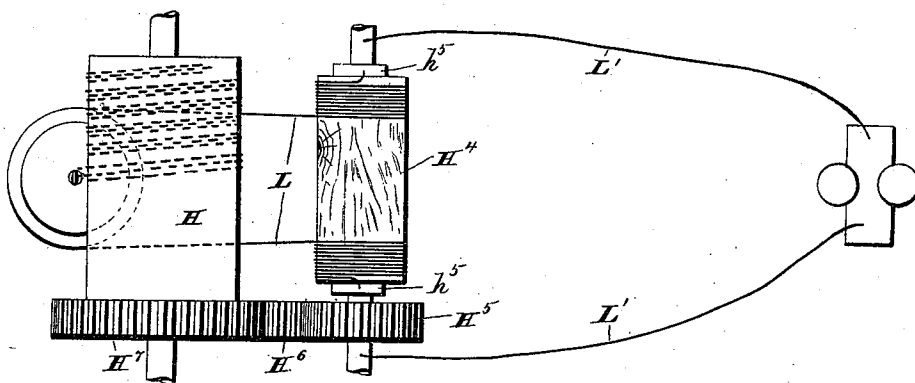


Fig. 4.



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Harry B. Ames

Inventor.
W. H. Morgan.
By [Signature]

UNITED STATES PATENT OFFICE.

WILLIAM HENRY MORGAN, OF ALLIANCE, OHIO.

MAGNETIC CRANE.

SPECIFICATION forming part of Letters Patent No. 496,432, dated May 2, 1893.

Application filed June 9, 1892. Serial No. 436,126. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HENRY MORGAN, of Alliance, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Magnetic Cranes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in magnetic cranes, the object being to provide a traveling crane with an electro-magnet carried by a chain mounted on a drum, the said magnet designed for handling ingots, plates and other metallic bodies.

My invention consists in a traveling bridge having a drum thereon, a chain carried by said drum, a magnet suspended from the chain, and devices carried by the bridge for moving the latter lengthwise the shop and for actuating and stopping the drums.

My invention further consists in the parts and combinations of parts as will be more fully described and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in side elevation of a traveling crane embodying my invention, and Fig. 2 is a plan view of same, and Figs. 3 and 4 are views showing the conductors leading to the magnets.

A represents rails located the required distance apart, the two rails or lines of rails constituting an overhead track on which the bridge B moves. This bridge is mounted or secured at its ends on trucks C, each of which is provided with flanged track wheels *a* which latter rest on the rails A, and prevent lateral displacement of the trucks C. One wheel *a* of each truck C is provided with a toothed wheel 6 fixed thereto, and motion is imparted to these wheels so as to cause the crane to move by means of the electric motor D, through the gearing now to be described.

Secured to the armature shaft of the motor is the small wheel 1 meshing with the larger wheel 2 the latter carrying the toothed wheel 3 which latter meshes with wheel 4, fast on shaft E. This shaft runs lengthwise the bridge and is provided on its opposite ends

with toothed wheels 5 meshing with the wheels 6, which latter as before stated are fast to the track wheels *a*. From the motor D and the train of wheels just described motion is imparted to the bridge simultaneously at both ends and by reversing the direction of the current through the motor the direction of travel of the bridge can be changed.

Ordinarily traveling bridges or cranes, are provided with trolleys adapted to move lengthwise of the bridge, the said trolley carrying the hoisting mechanism. This crane instead of being provided with a movable trolley is provided with one, or a series of drums mounted in bearings rigidly secured to the bridge, the said drums being arranged lengthwise the direction of the length of the bridge as shown, and are all mounted on a single shaft F which latter is actuated by the motor G. This motor G, which I term the hoist motor, is carried by the bridge and one truck and is provided on its armature shaft with a small toothed wheel 7 meshing with the toothed wheel 8. This wheel 8 carries the smaller wheel 9 which in turn meshes with wheel 10 keyed to shaft F. The shaft F is supported at intervals throughout its length by bearings *d*, and in the present instance carries five drums H, each of which is provided with two clutches I I', one of which, I, is designed to hold the drum against movement, while the other is designed for locking the drum to the shaft. Each clutch I' for locking the drum to the shaft consists of two parts *i* and *i'*, the part *i'* being fast to shaft F and the part *i* fast to the drum so that when the two parts of the clutch (the construction of which is immaterial so far as the invention involved in this application is concerned) are locked together, the drum, or drums are caused to revolve with the shaft and in the direction of rotation of the shaft. The other clutch I of each pair also consists of two parts *i*² and *i*³, the former of which is rigidly secured at its base to the top of the bridge, while the latter part *i*³ like the part *i* of the clutch I' is keyed to the drum H so as to revolve therewith.

From the foregoing it will be seen that when the parts *i*³ and *i*² of the clutch I are disen-

gaged, and the parts i , i' of the clutch I' locked together, the drum or drums as the case may be will revolve with shaft F . It is essential however to provide means for actuating the two clutches of one drum simultaneously, so as to lock the two sections of one clutch at the same time the two sections of the other clutch are disengaged. This is accomplished by levers and devices connected to the actuating handles J located with the operator's cage K depending from the bridge at one end thereof. A handle J is provided for each drum, and are preferably located side by side and close together so as to be within easy reach of the operator. Each handle is in the form of a bell crank lever the short end of which is connected to a pitman J' .

For convenience I will describe the devices for actuating the drum clutches immediately over the cage K , and as the general features in all are alike a description of one will suffice for all. The pitman J' extends upwardly and is connected to the crank n on shaft n' mounted in supports n^2 . This shaft is provided with a yoke engaging a groove in cone n^4 and hence when the shaft n' is rocked the cone is moved toward or away from the clutch as the case may be. The shaft n' is also provided with a depending arm n^5 to which is secured the rod n^6 . The opposite end of this rod is connected to the lower end of arm n^7 secured to the shaft n^8 , the latter being mounted in bearings n^9 . This shaft n^8 is provided with a yoke n^{10} which engages cone n^{11} . By this arrangement it will be seen that when shaft n' is rocked and the cone n^4 moved in one direction the shaft n^8 and cone n^{11} are moved in the opposite direction, thus locking one clutch and releasing the other. With the second and third drums from the cage side of the crane, the rods n^6 are in a plane over the drums, while with the fourth and fifth drums the arrangement is about the same as the arrangement above described. With this arrangement any or all the drums can be rotated and by reversing the motor the direction of rotation of the shaft is changed.

Each drum carries a chain to the lower end of each of which is suspended an electro magnet. These magnets all have smooth flat lower faces so as to adapt them to rest solidly on a plate, ingot or other body or bodies of metal to be lifted, and are supplied with current of electricity by the wires L wound on drums H^4 and connected at their ends to the metal collars h^5 . The drum is preferably made of wood and the wires L' leading from the dynamo are connected electrically by brush or other contact to the collars h^5 the two collars on each drum H^4 being insulated from each other, so that the current must of necessity pass through the coils surrounding the magnet before it returns to the dynamo. The drums H^4 are each provided with a wheel H^5 made of vulcanized fiber or other insulating material, or if of metal, it must be insulated

from the collar or bearing h^5 to which it is secured. This wheel H^5 meshes with a small pinion H^6 which in turn engages gear wheel H^7 fast to the drum H . Thus it will be seen that when drum H is revolving drum H^4 will revolve therewith and wind up or unwind as the case may be the wires L leading to the magnet. These magnets can be used for lifting long heavy plates, and are more desirable for this purpose than the sling ordinarily used, as they do not bend or otherwise distort the plates, and one or more of the magnets can be used for shorter plates, ingots and like articles.

It is evident that numerous slight changes and alterations might be resorted to in the relative arrangement of parts herein described without departing from the spirit and scope of my invention hence I would have it understood that I do not wish to limit myself to the exact construction of parts herein described, but,

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an overhead traveling crane, the combination with a traveling bridge, a series of drums thereon, and means whereby said drums can be rotated independently or in unison, of a magnet suspended from each drum, substantially as set forth.

2. In a crane the combination with a driving shaft a series of drums loosely mounted on said shaft, clutches for locking the drums to the shaft, and clutches for locking the drums against rotation, of a magnet suspended from each drum, substantially as set forth.

3. In a crane, the combination with a shaft, a series of drums loose thereon, clutches arranged in pairs one pair for each drum, one clutch of each pair adapted to lock its drum against rotation and the other adapted to lock its drum to the shaft and means for coupling the clutches of each pair whereby they are moved in unison, of a magnet suspended from each drum.

4. In an overhead traveling crane, the combination with a traveling bridge, a motor and gearing for moving same, a driving shaft mounted on the bridge and motor and gearing for actuating the shaft, of a series of drums loosely mounted on said shaft, means for locking said drums against rotation and means for locking them to the shaft substantially as set forth.

5. In an overhead traveling crane, the combination with a traveling bridge and motor and gearing for actuating same, a shaft mounted on said bridge and motor and gearing for actuating said shaft, of drums loosely mounted on the shaft and clutches and levers and rods as described for actuating the clutches whereby all of the drums can be rotated simultaneously, or one or more of them locked against rotation while the others are rotating, substantially as set forth.

6. In an overhead traveling crane, the combination, with a traveling bridge, a driving shaft arranged lengthwise said bridge, a series of drums actuated by said shaft and
5 means for controlling the rotation of said drums, of a magnet suspended for each drum substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WILLIAM HENRY MORGAN.

Witnesses:

F. E. DUSSIEL,

H. W. HARRIS.