

No. 732,923.

PATENTED JULY 7, 1903.

T. A. COFFIN.
COAL HANDLING MACHINERY.

APPLICATION FILED SEPT. 25, 1902.

NO MODEL

4 SHEETS—SHEET 1.

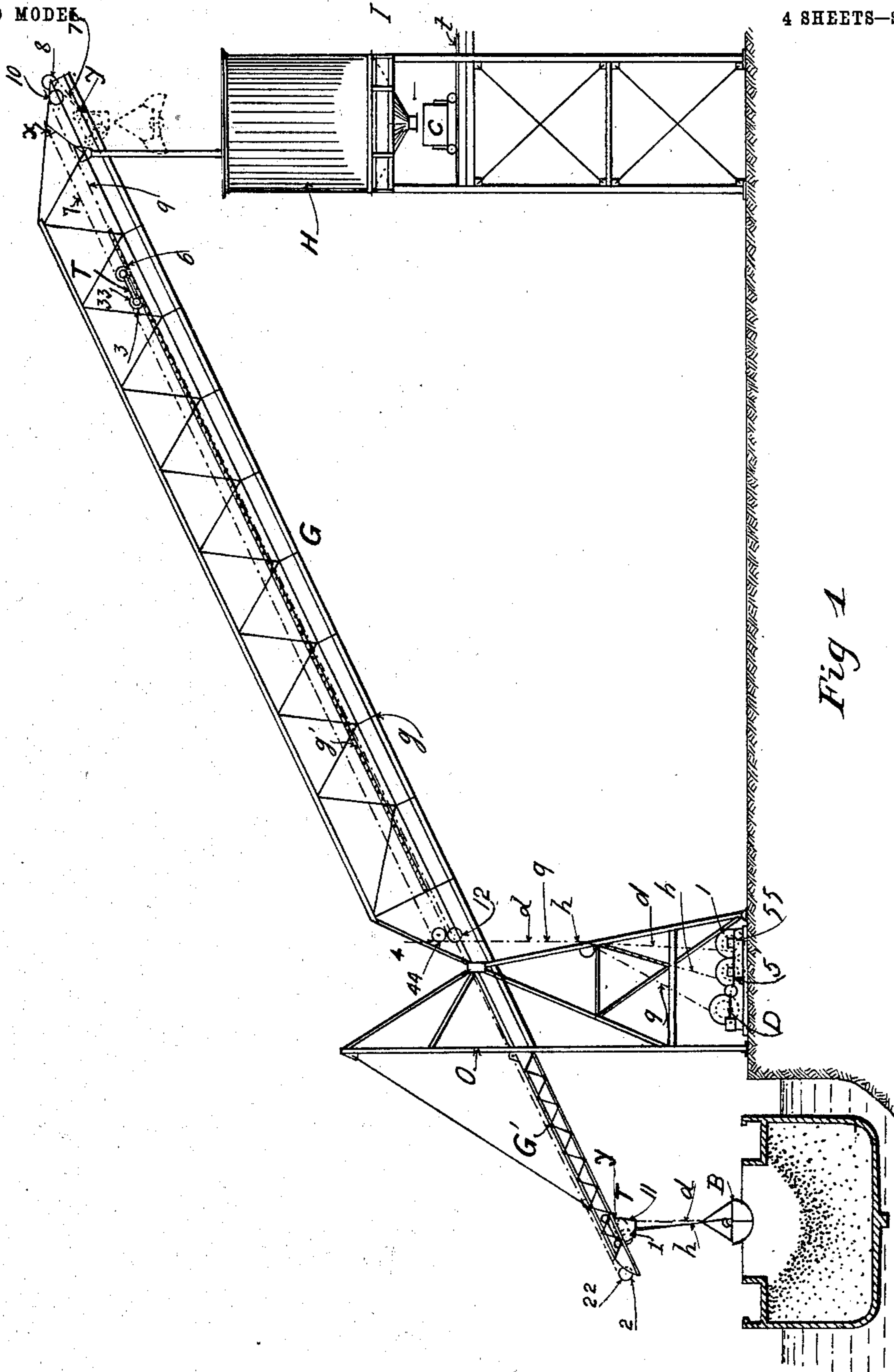


Fig. 1

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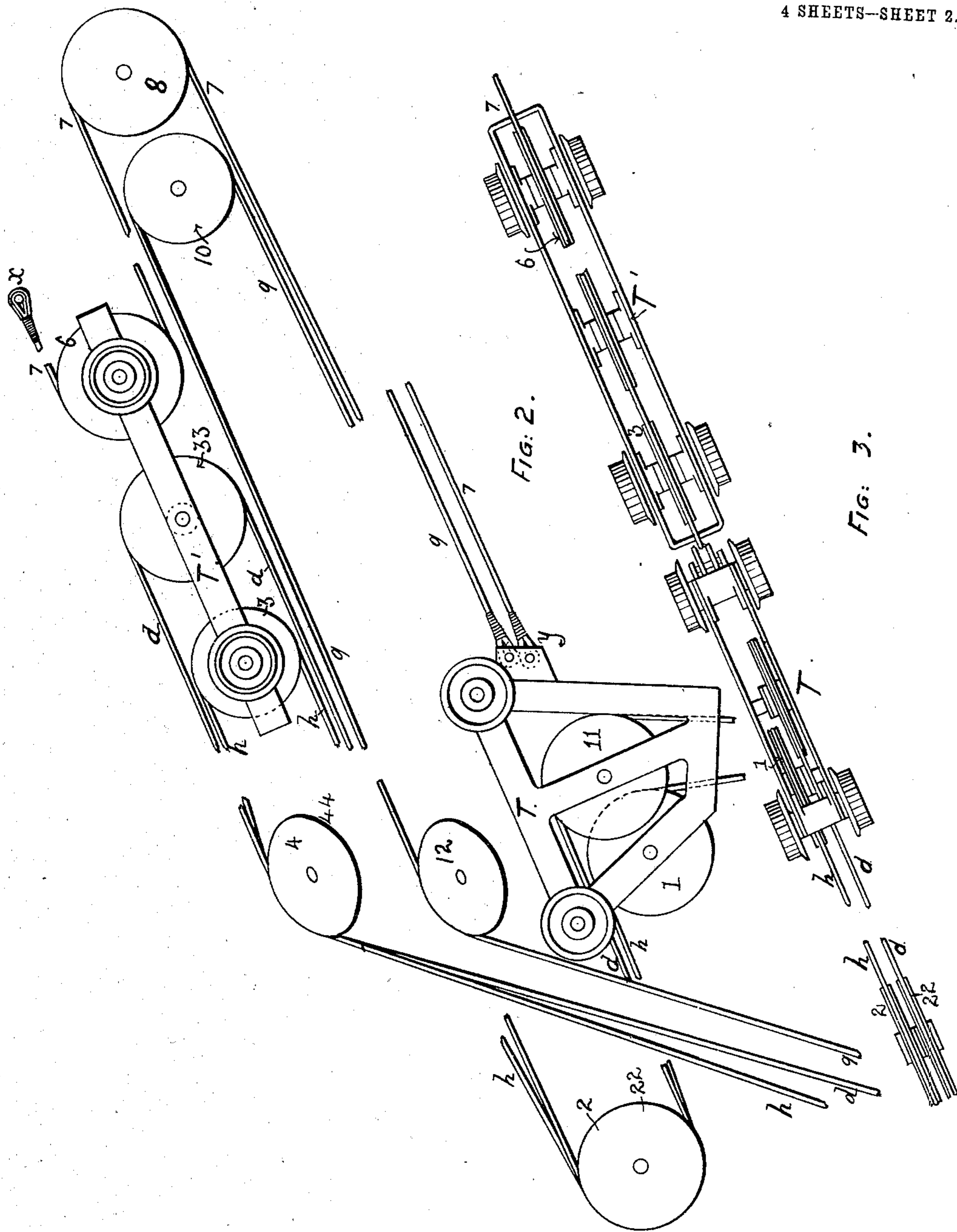
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4 SHEETS--SHEET 2.



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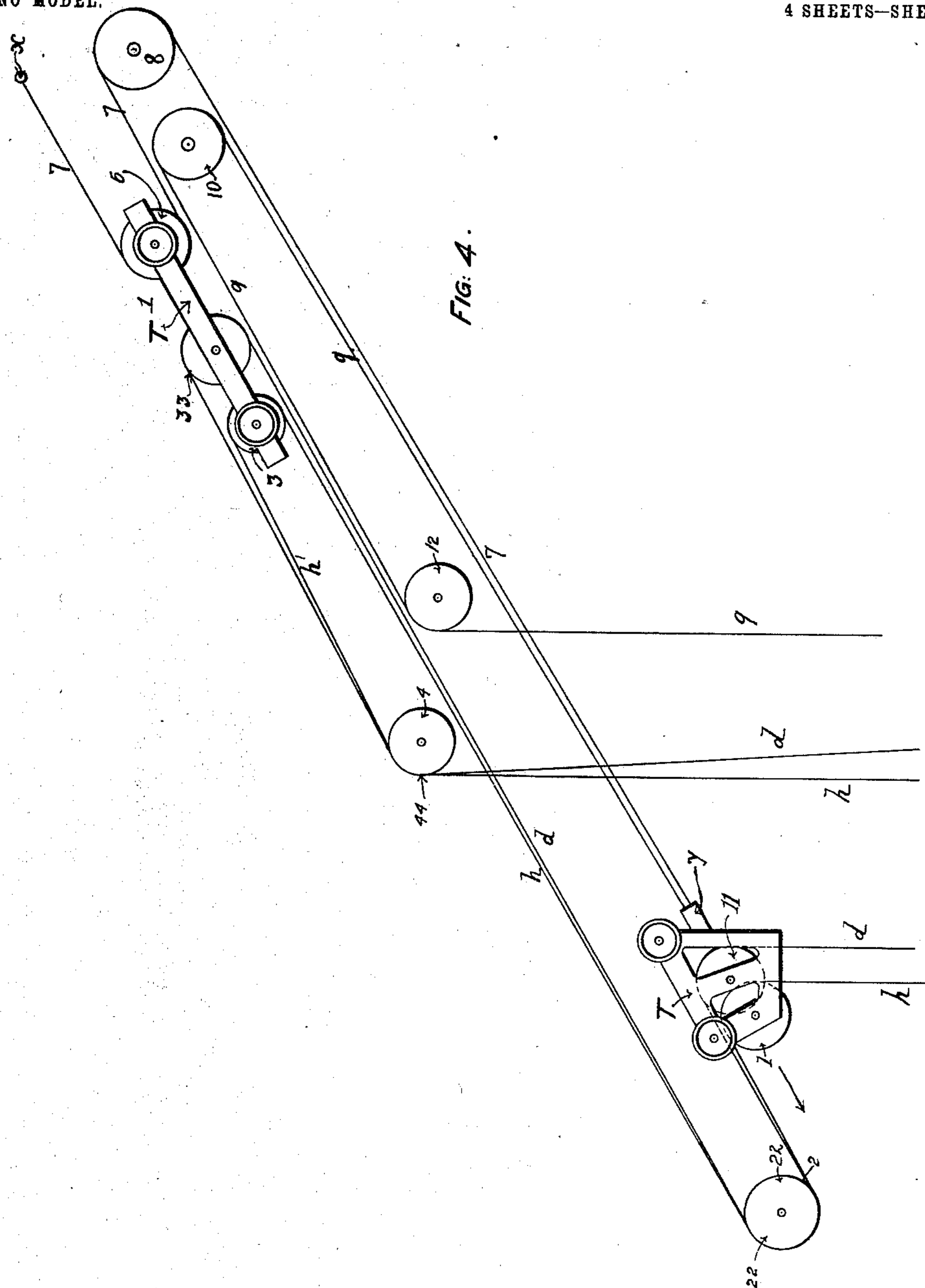
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NO MODEL.

4 SHEETS—SHEET 3.



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NO MODEL.

4 SHEETS—SHEET 4.

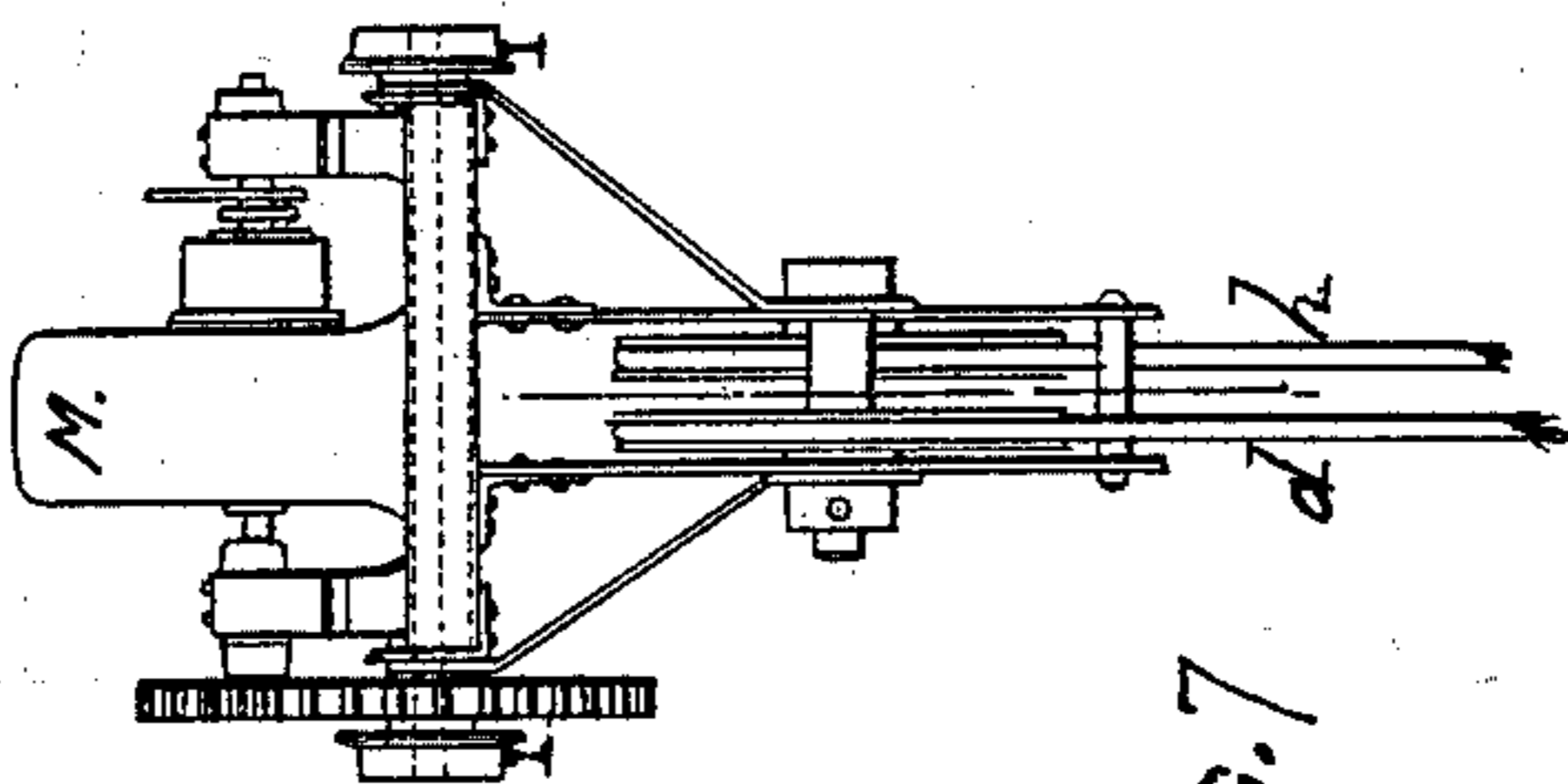
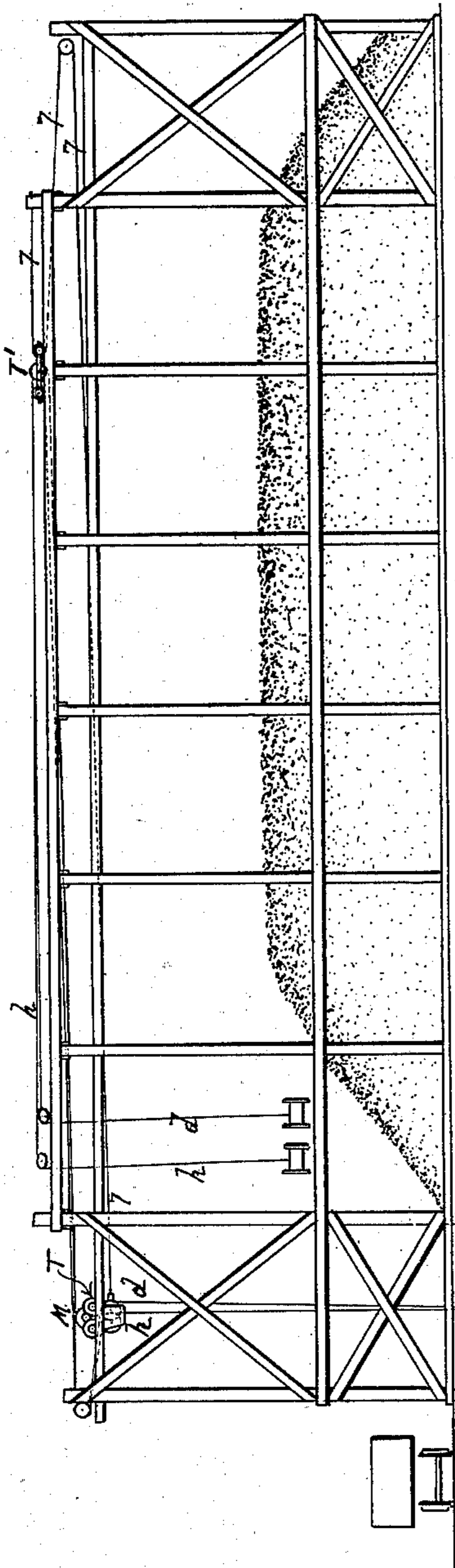


FIG. 7

FIG. 5.

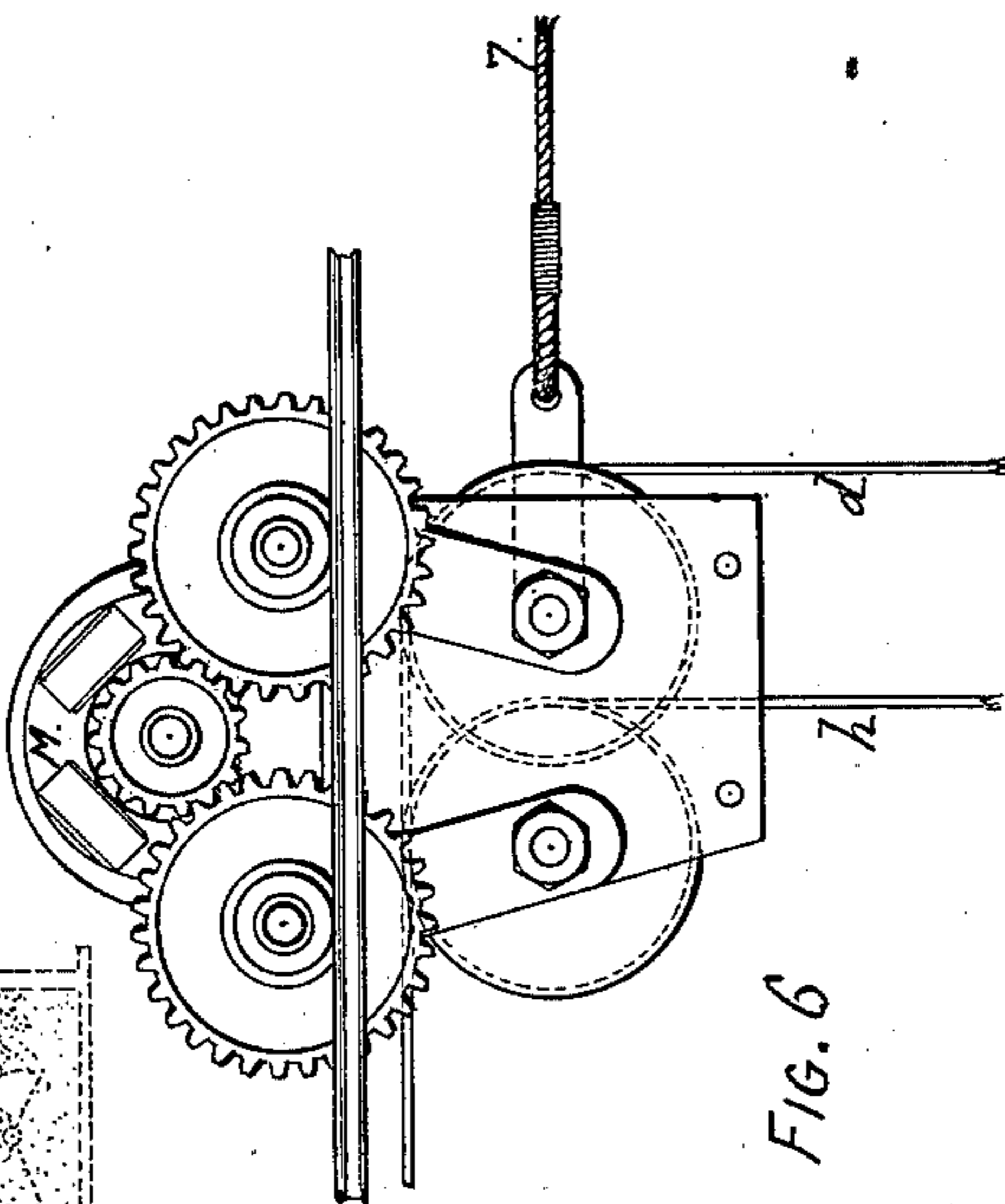


FIG. 6

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UNITED STATES PATENT OFFICE.

THOMAS AMORY COFFIN, OF WEST NEW BRIGHTON, NEW YORK.

COAL-HANDLING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 732,923, dated July 7, 1903.

Application filed September 25, 1902. Serial No. 124,867. (No model.)

To all whom it may concern:

Be it known that I, THOMAS AMORY COFFIN, a citizen of the United States of America, and a resident of West New Brighton, Staten Island, in the county of Richmond, in the State of New York, have invented new and useful Improvements in Coal-Handling Machinery, of which the following is a specification.

This invention relates to hoisting and conveying apparatus, and is particularly applicable to coal-handling machinery.

One of the main objects of my invention is to so construct the apparatus as to do away with the necessity for counterweights, thus saving racking strains, lessening the power required, and permitting a strong structure to be built at small cost.

A further object is to simplify the construction and operation of the hoisting means.

In the accompanying drawings, Figure 1 is a side elevation of a coal-handling structure embodying my invention. Fig. 2 shows a side view of the sheaves and trolleys and rope connections of Fig. 1. Fig. 3 is a plan of the trolleys and sheaves of Fig. 2. Fig. 4 is a diagram of the trolleys and sheaves with their rope connections. Fig. 5 is a diagram of a modification, and Figs. 6 and 7 are views of the trolley of Fig. 5.

In the construction shown in Fig. 1, O is an outside or wharf end tower, and I is an inside tower, having a hopper H opening at its lower end to a car C on a track *t*, as usual. An inclined girder or bridge G, having two lines of track *g* and *g'* alongside of each other, connects these two towers and is continued beyond the tower O in a boom G', which extends out over the boats or cars to be unloaded.

My invention will be best understood by reference to the diagram Fig. 4, in connection with Figs. 1, 2, and 3. The hoisting-bucket may be of any suitable form, and in the drawings I have shown it as in the form of a clam-shell bucket B, in which case there will be needed in addition to the hoisting-rope *h* a dumping-rope *d*, as usual. The hoisting-rope *h* passes over a sheave 1 on the bucket-trolley T, which runs on a tramway *g*, and extending throughout the length of the bridge or girder or as far thereon as the conveying requirements demand. The hoisting-rope

thence passes around a sheave 2 on the outer end of boom or other suitable part of the fixed structure and thence around a sheave 3 on a second trolley T', which I call the "balancing-trolley" and which can traverse on the second tramway *g'* on the bridge or girder. This tramway *g'* does not need to be as long as the tramway *g*, Fig. 1. From the sheave 3 the hoisting-rope *h* passes over a sheave 4 on the bridge and thence to the hoisting-drum 5. On the balancing-trolley T' is a sheave 6, over which passes a rope 7, secured at one end *x* to a fixed point on the structure, while the other end is secured at *y* to the trolley T after passing over a sheave 8 on the structure. This rope 7 thus passing over sheave 6 on the trolley T' in opposition to the hoisting-rope *h* passing over the sheave 3 on the same trolley and being connected to the bucket-trolley T at *y* in opposition to the pull of the rope *h* thereon the load and hoisting strains on the trolley T, imparted through the hoisting-rope *h* in the direction of the arrow, Fig. 4, are effectually counterbalanced through the trolley T', and accordingly the bucket-trolley T is maintained in equilibrium during the hoisting operation.

When the bucket B has been hoisted to the trolley T, or the desired height, the trolley can easily be traversed on its tramway by other means. In the construction shown in Figs. 1, 2, and 3 a conveying-rope 9, connected to the trolley, as at *y*, passes over a sheave 10 on the structure and thence over another sheave 12 to the conveying-drum D. By winding this rope upon its drum D the trolley T, with its loaded bucket, can be conveyed in-board on its tramway, the counterbalancing-trolley T' traveling on its tramway in the opposite direction one-half the distance. When the bucket has been dumped, the trolley T will travel down the inclined tramway by gravity back to the loading-point on release of the hoisting-drum to allow the bucket to descend.

If a clam-shell bucket B be used, the dumping-rope *d* may be carried over a sheave 11 on the trolley T, a sheave 22, alongside sheave 2, Figs. 2 and 3, on the end of the boom, thence over a sheave 33 on counterbalancing-trolley T', and over a sheave 44, alongside

sheave 4, to its winding-drum 55, Fig. 1. If other well-known styles of hoisting and conveying buckets or carriers are used, this dumping-rope and its sheaves may be omitted, of course.

In the construction described practically all the work the conveying-drum D and its engines have to do is to overcome the gravity due to the inclination of the bridge or girder G. If, however, this latter lie in a substantially horizontal plane, as indicated in Fig. 5, gravity will not have to be overcome, and the power required to traverse the trolley and load will be so small that an electric motor M, mounted on the trolley itself, may be used to furnish the required power for traversing. Current may be supplied to this motor in any suitable or well-known manner under control of a switch in the engine-house. By means of an electric controller rapid work may be accomplished by this construction, as it permits acceleration of speed of the moving trolley between start and finish.

I claim as my invention—

1. In a hoisting and conveying apparatus, the combination of a bucket-trolley having a sheave over which the hoisting-rope passes with a counterbalancing-trolley also having a sheave over which said rope passes, and a rope connected to the structure and to the bucket-trolley and passing over a sheave on the counterbalancing-trolley in opposition to the strain thereon of the hoisting-rope, substantially as described.

2. In a hoisting and conveying apparatus, a hoisting-drum and a traversing drum, a bucket-trolley having a sheave over which the rope from the hoisting-drum passes, and a fixed tramway for said trolley in combination with a second trolley, a tramway for the latter, and means whereby the strains of the rope from the hoisting-drum on the bucket-trolley are counterbalanced through the second trolley, substantially as described.

3. In a hoisting and conveying apparatus, a hoisting-drum and a traversing drum, a bucket-trolley having a sheave over which the rope from the hoisting-drum passes, in combination with a second trolley and a rope connection to the first trolley whereby the strains of the rope from the hoisting-drum on the bucket-trolley are counterbalanced

through the second trolley, substantially as described.

4. In a hoisting and conveying apparatus, a hoisting-drum and a traversing drum, a bucket-trolley having a sheave over which the rope from the hoisting-drum passes, in combination with a sheave-trolley, connections between the two trolleys whereby the strains of the rope from the hoisting-drum on the bucket-trolley are counterbalanced through the second trolley, and means for traversing the balanced trolley.

5. In a hoisting and conveying apparatus, a bucket-trolley having a sheave over which the hoisting-rope passes and an inclined tramway for said trolley in combination with a second trolley and tramway, means whereby the strains of the hoisting-rope on the bucket-trolley are counterbalanced through the second trolley, and means for traversing the balanced trolley up its inclined tramway.

6. In a hoisting and conveying apparatus, a bucket-trolley, a tramway therefor, a second trolley and a tramway therefor, alongside the first tramway, in combination with a sheave on the bucket-trolley, a rope from the bucket passing over said sheave to the hoisting-drum and means whereby the strains of the rope from the hoisting-drum to the bucket are counterbalanced through the second trolley, substantially as described.

7. In hoisting and conveying apparatus, a bucket-trolley, a sheave thereon, a tramway for said trolley, a second trolley, also having a tramway, and a rope secured to a fixed part of the supporting-frame and passing over a sheave on the second trolley, in combination with a sheave at the end of the bucket-tramway, over which said rope also passes and is secured at its other end to said bucket-trolley, a hoisting-drum, a rope therefrom passing over a sheave on the second trolley and over a sheave on the bucket-trolley to the bucket, substantially as described.

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

THOMAS AMORY COFFIN.

Witnesses:

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HERBERT HOWSON.