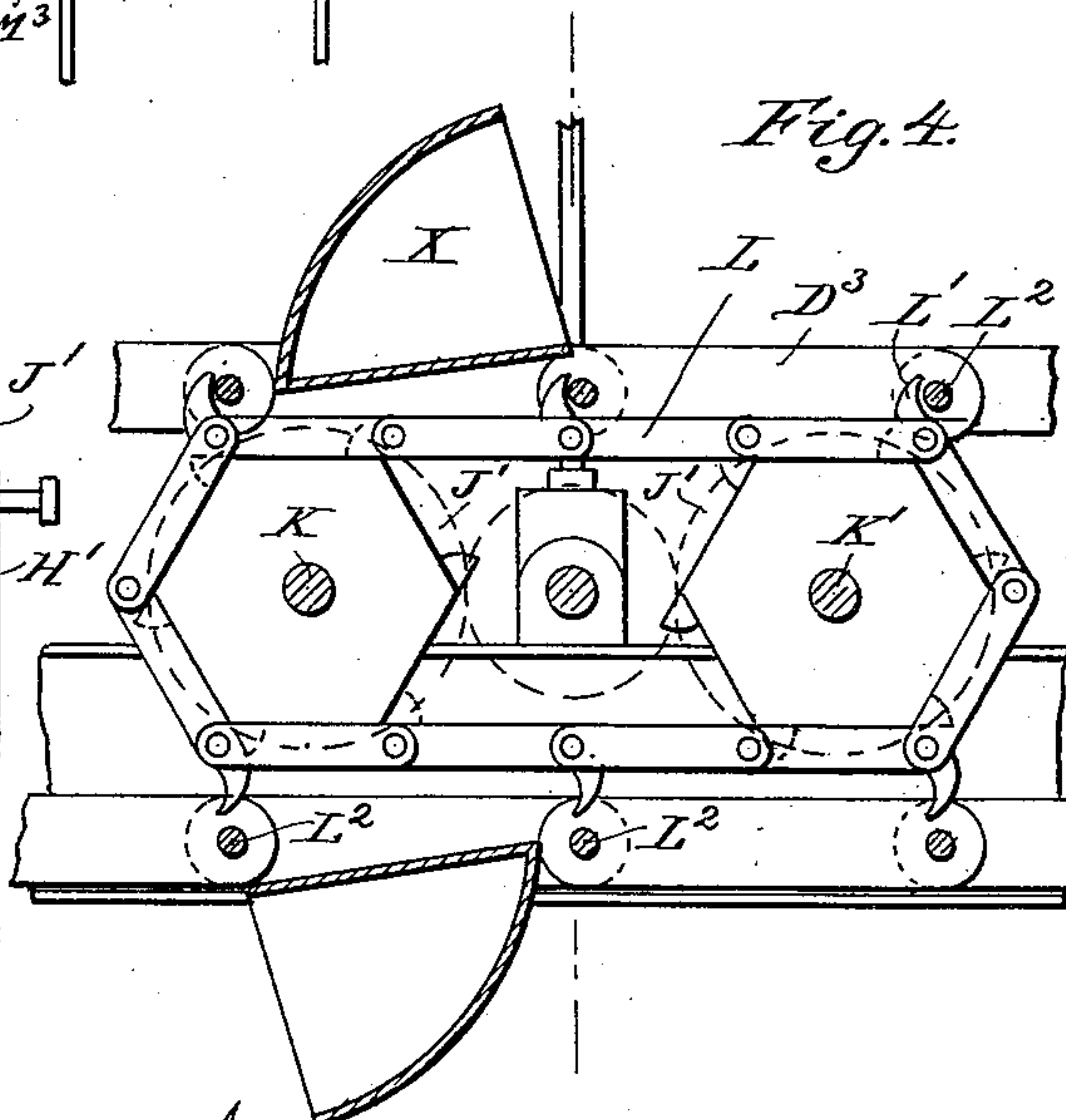
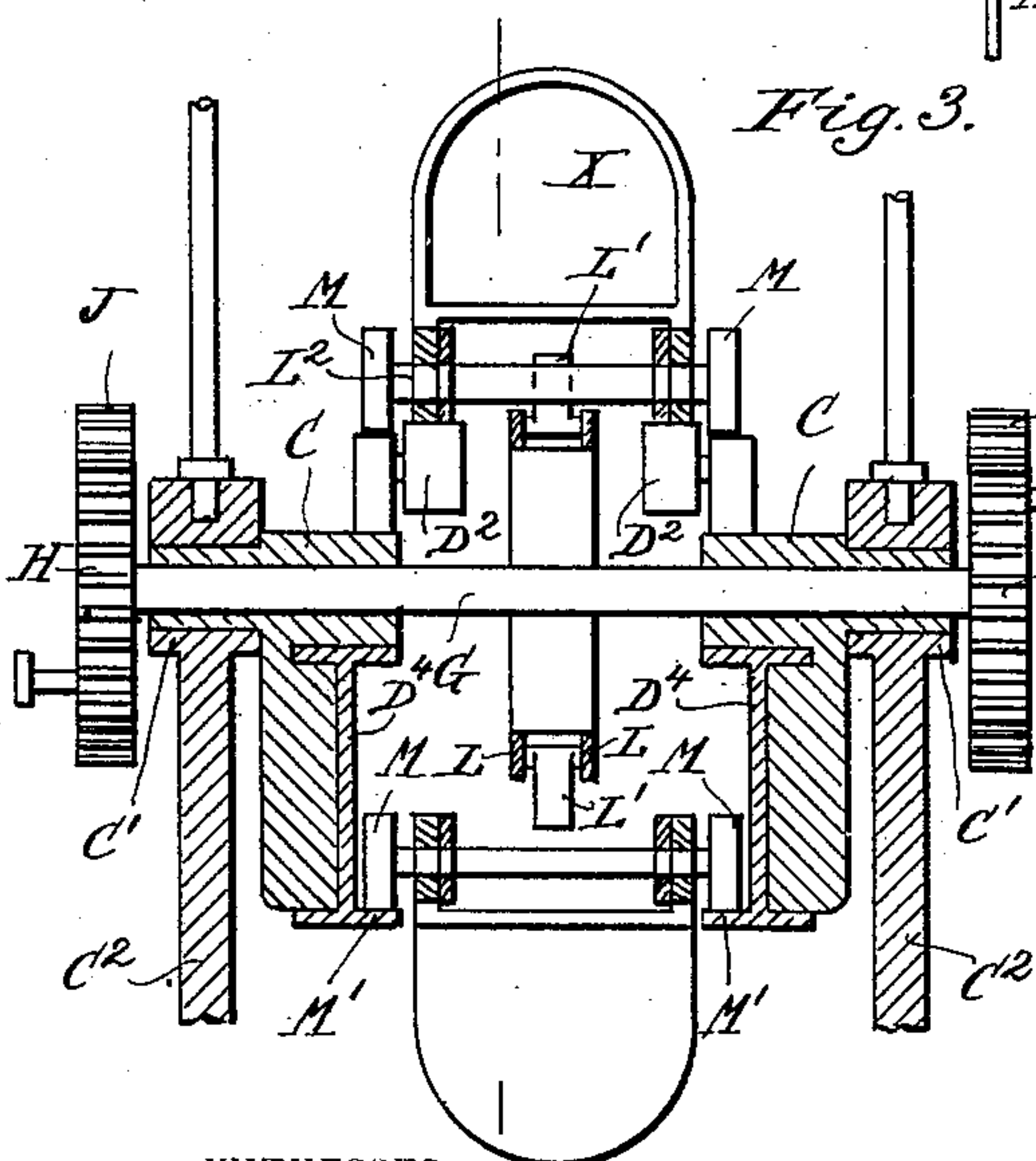
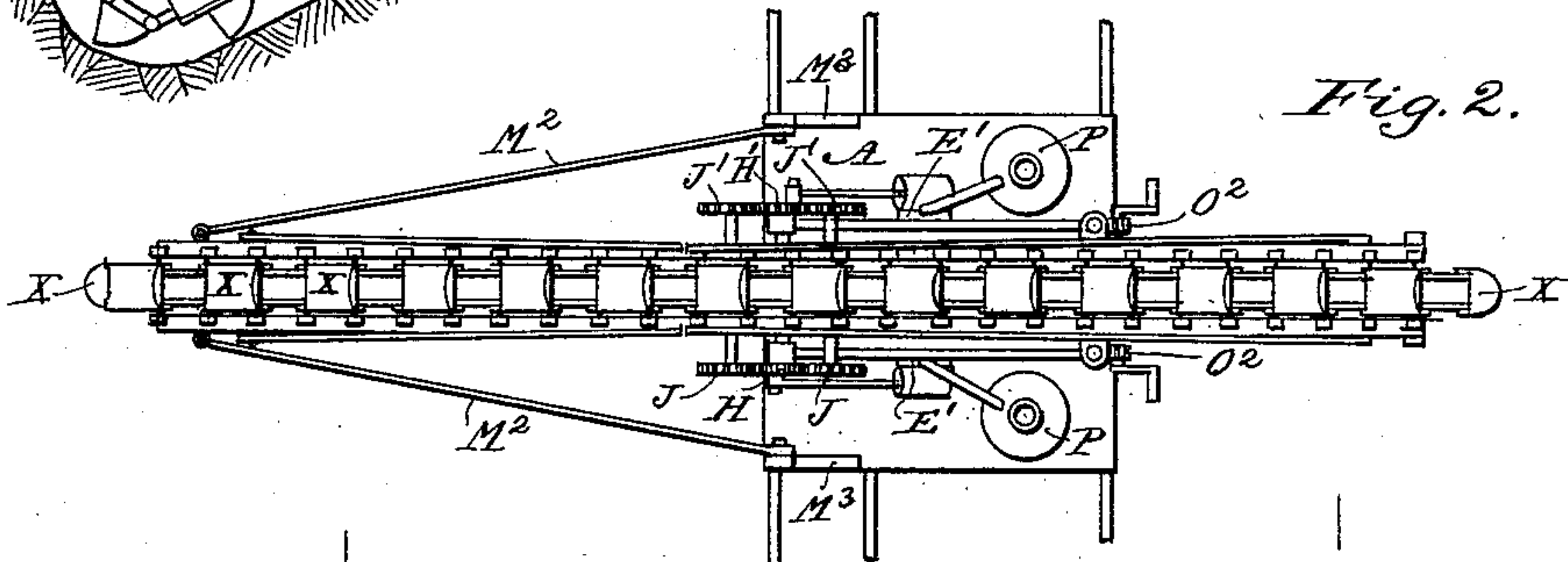
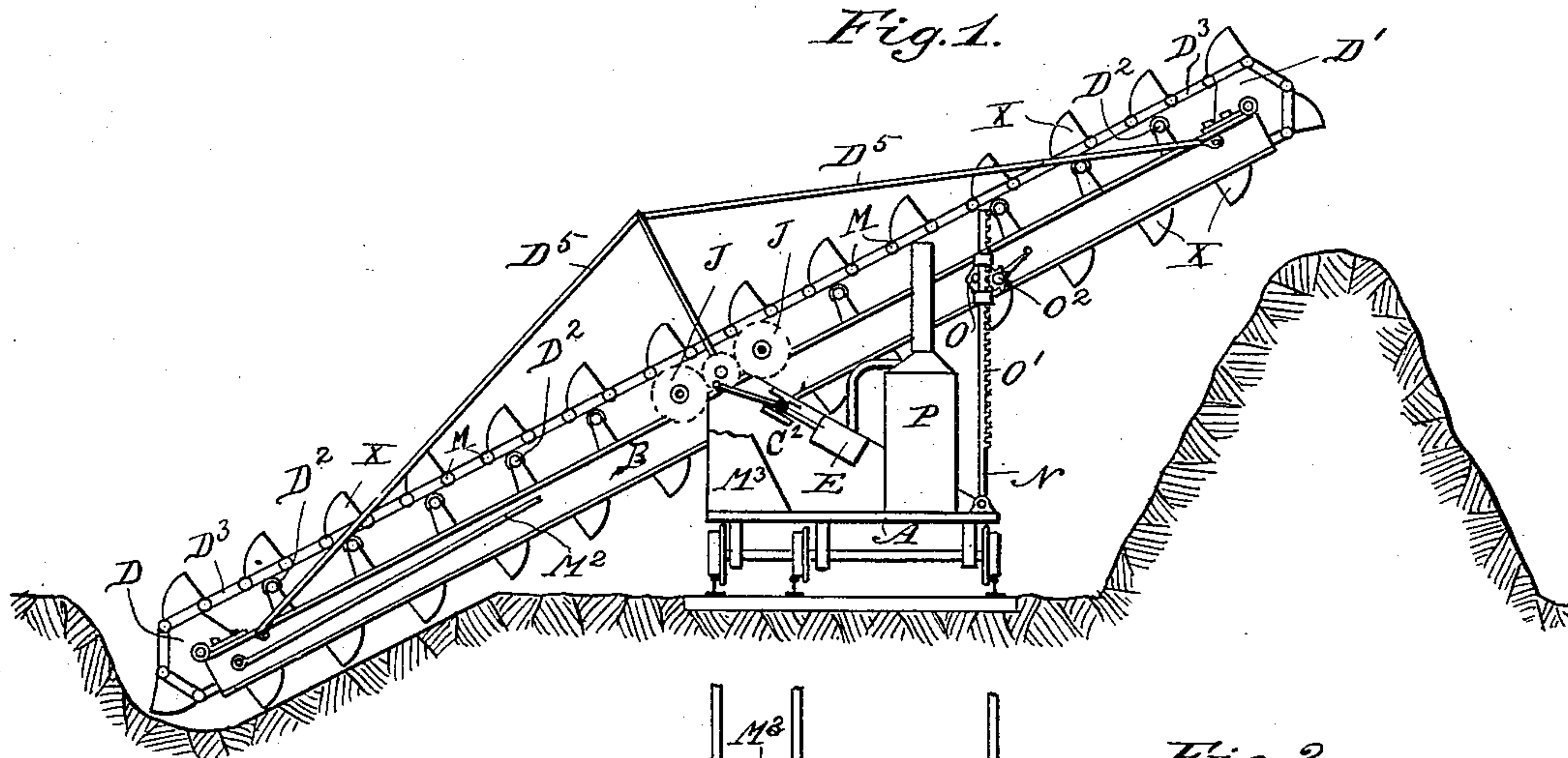


(No Model.)

A. W. ROBINSON.
EXCAVATING MACHINE.

No. 435,547.

Patented Sept. 2, 1890.



WITNESSES:

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Frederick Smith

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UNITED STATES PATENT OFFICE.

ARTHUR W. ROBINSON, OF BUCYRUS, OHIO.

EXCAVATING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 435,547, dated September 2, 1890.

Application filed January 20, 1890. Serial No. 337,515. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR W. ROBINSON, a citizen of Canada, and a resident of Bucyrus, in the county of Crawford and State of Ohio, have invented certain new and useful Improvements in Excavating-Machines, of which the following is a specification.

My improvements in excavating-machines relate to that class of machines in which an endless chain of buckets is employed; and it consists in the construction, arrangement, and coaction of the parts, as hereinafter set forth and claimed.

In the drawings the same reference-letters indicate the same parts in all the figures.

Figure 1 is a side elevation of the machine in position while making a cut. Fig. 2 is a plan view of the machine. Fig. 3 is a cross-section of the cantalever at the center, showing the driving-shaft; and Fig. 4 is a side view of a secondary drive-chain.

It will be observed that the proportions of the drawings are not accurate. This is in order that the several parts may be more plainly seen and understood.

A, Figs. 1 and 2, is a car-platform upon which the machinery is mounted. It is shown as supported on wheels which run on a three-rail track. The supporting and moving devices may, however, be of such suitable form as preferred.

B is a centrally-supported girder or cantilever having drums D and D'—one at each end—and rollers D², suitably supported upon its upper side for the purpose of carrying an endless chain of buckets D³. The cantalever may be of timber or iron, preferably the latter, and if built of iron may be of beams of I-section, as shown in Fig. 3 at D⁴, or other suitable shape, and stiffened by truss rods D⁵, as shown.

The cantalever is supported by the trunnions C C, Fig. 3, which rest in suitable bearings C' C' in the upright frame-work C² C² of the car.

In order to avoid the transmission of power to one of the end drums or "tumblers" D D', (by means of which such chains of buckets are usually driven,) and also to avoid the excessive tension which would come upon the chain if driven from the upper drum D', the driving-power is applied at the center of the

cantalever by means of a secondary drive-chain and gearing.

The construction of the driving mechanism is as follows:

E, Fig. 1, is one cylinder of a pair of engines E' E', attached to the upright frame-work C² of the cantalever. The crank-shaft G of these engines passes through the trunnions C C, Fig. 3. As these trunnions constitute the axis about which the cantalever has a vertical swinging movement, it follows that the position of the crank-shaft is not affected thereby.

On the end of the crank-shafts are pinions H H', which gear into and drive spur-wheels J J and J' J', Figs. 1 and 2. These spur-wheels are keyed upon the shafts K K', Figs. 1, 2, and 4, and serve to drive the secondary chain L, which is formed with projecting teeth or hooks L', adapted to engage with the hinge-pins L² of the links of the bucket-chain D³ or against the rear end of the buckets when formed integral with the links.

In order to confine the lower side of the bucket-chain to the cantalever, so that it may pass over the car-platform and also that it may cut a straight slope downward from the bank, the ends of the hinge-pins L², connecting the links of the chain, are extended laterally and fitted with rollers M M, which run in ways M' M', provided for them on the inside of the girders composing the cantalever.

The drum D or D' is mounted in sliding bearings to regulate the tightness of the bucket-chain. The buckets are seen at X.

M² M² are two stay-rods attached to the forward end of the cantalever and pivotally attached to side frames M³ M³ in line with the axis of the cantalever, whereby the forward end of the cantalever is suitably supported against lateral resistance.

The vertical movement of the cantalever is controlled by two vertical arms N, hinged to the car-platform or otherwise adapted to the necessary deviation from a vertical line. These arms are arranged to slide through guide-pieces O, pivotally attached to the sides of the cantalever, and the motion is produced or restrained by means of a rack O' and pinion O² or other suitable device.

P P are two boilers for supplying steam to the engines.

The car is propelled at slow speed upon the

track by a suitable gearing connecting the engines with the axles, and arranged to be disconnected, as desired.

5 An obvious use of the machine is to act as an elevator or conveyer for material to be delivered to it at the lower end, a suitable hopper being attached for the purpose.

I claim as follows:

10 An excavating-machine comprising a centrally-supported cantalever having drums at either end, over which an endless chain of buckets passes, and a secondary driving-chain

which receives power at the axis of the cantalever and which automatically engages and disengages the bucket-chain and propels it, 15 substantially as set forth.

Signed at Bucyrus, in the county of Crawford and State of Ohio, this 8th day of January, A. D. 1890.

ARTHUR W. ROBINSON.

Witnesses:

PHILLIPS ABBOTT,
FREDERICK SMITH.