(No Model.)

3 Sheets—Sheet 1.

H. F. CRANDALL.

HARVESTER.

No. 407,063. Patented July 16, 1889.

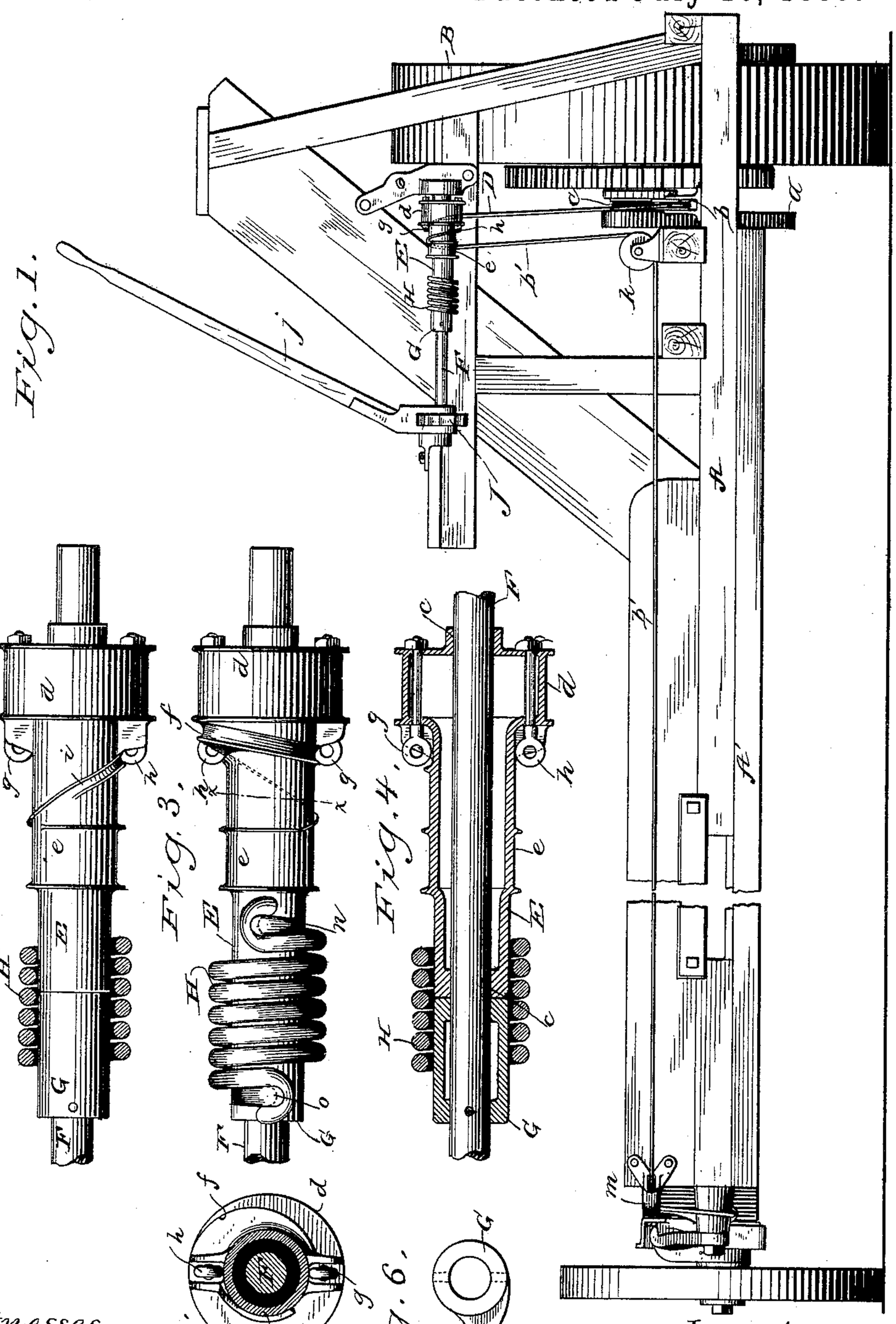

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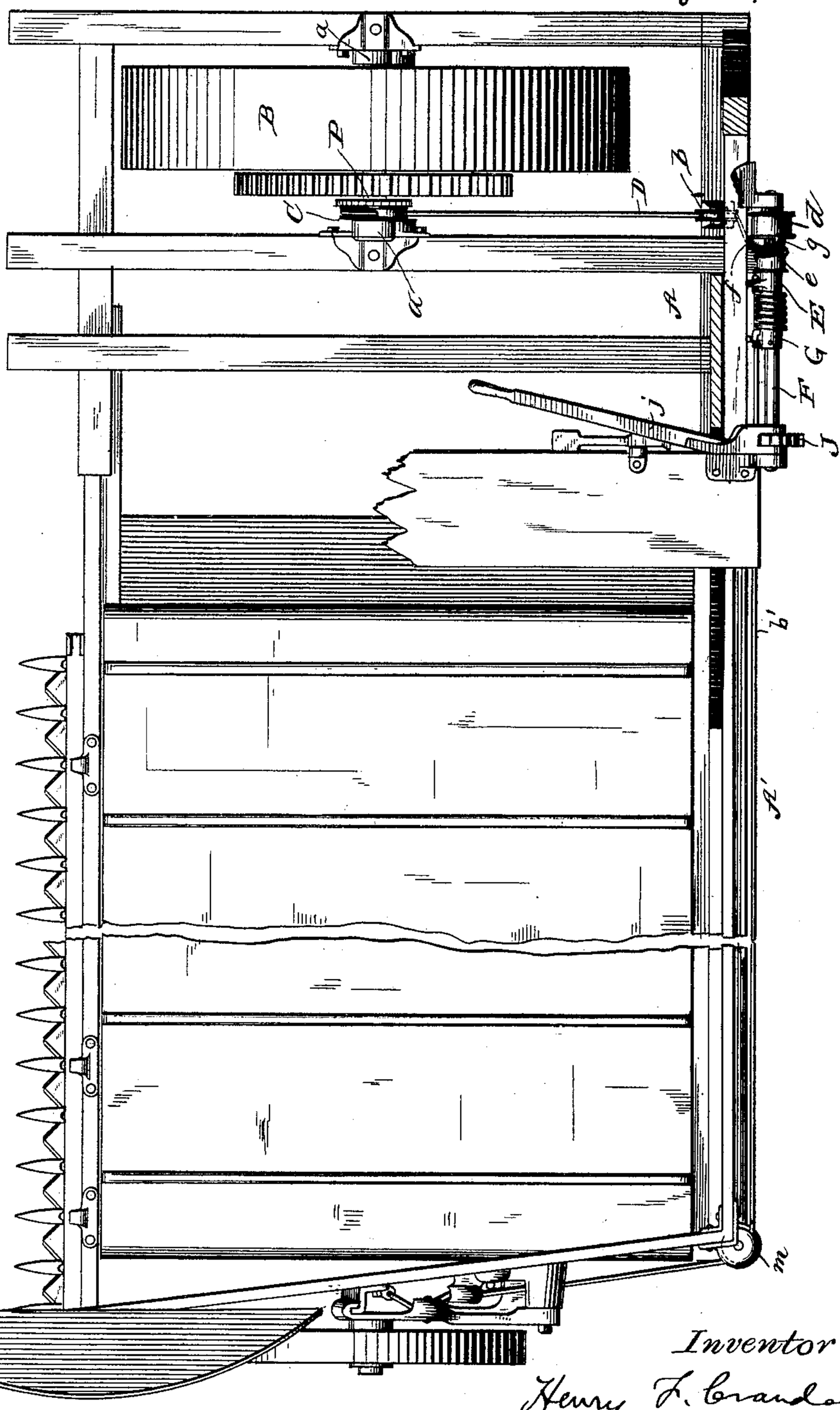
Fig. 4.



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HARVESTER.

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Fig. 9.

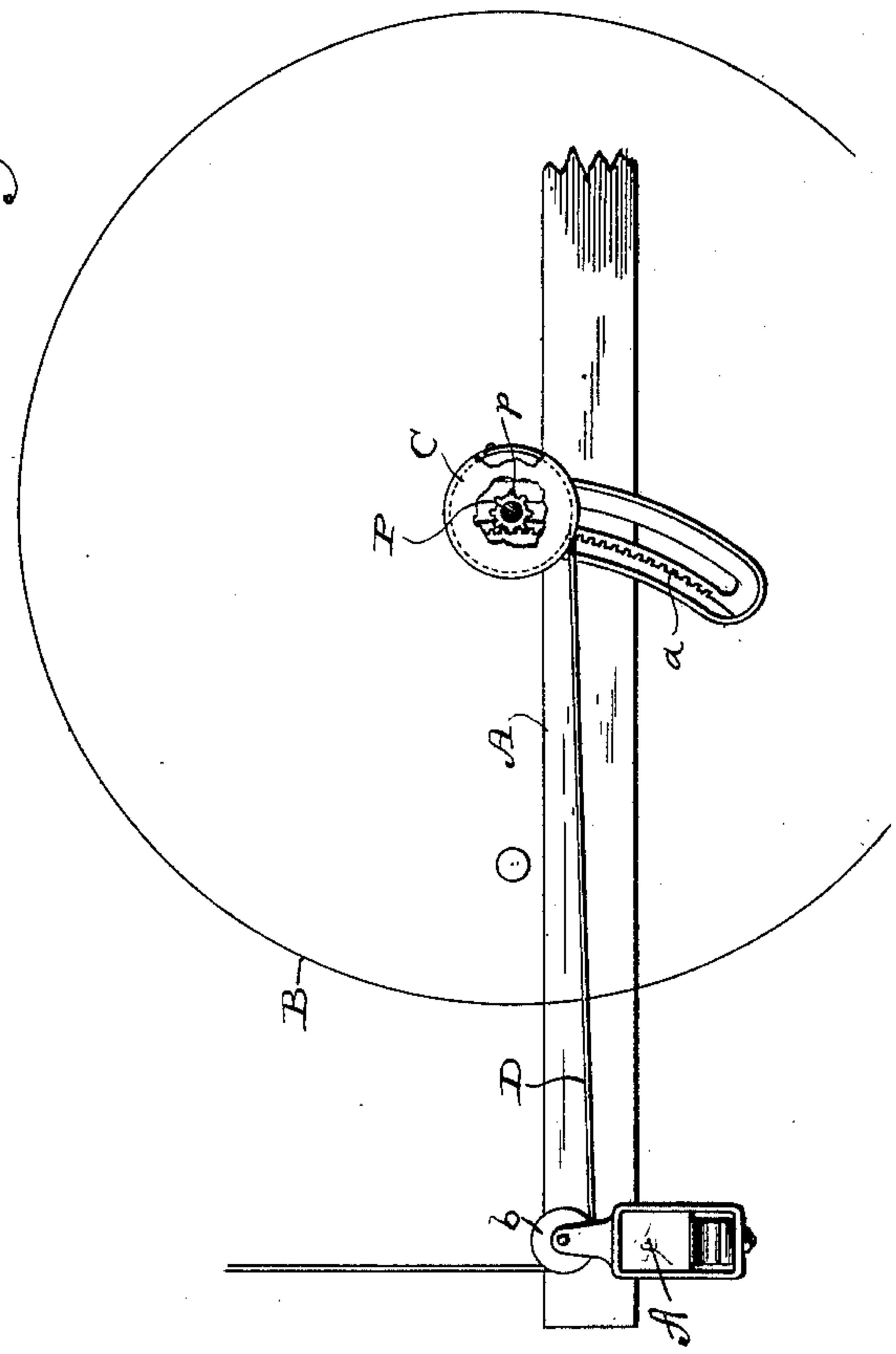
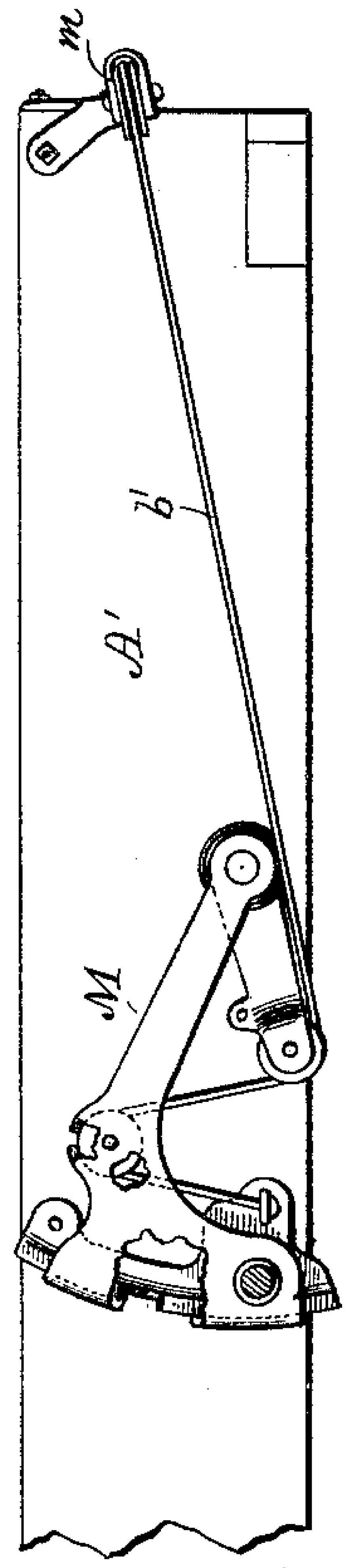


Fig. 8.



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UNITED STATES PATENT OFFICE.

HENRY F. CRANDALL, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO THE MILWAUKEE HARVESTER COMPANY, OF SAME PLACE.

HARVESTER.

SPECIFICATION forming part of Letters Patent No. 407,063, dated July 16, 1889.

Application filed September 6, 1887. Serial No. 248,938. (No model.)

To all whom it may concern:

Be it known that I, HENRY F. CRANDALL, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Harvesters; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to harvesters, and will be fully described hereinafter.

In the drawings, Figure 1 is an elevation of the rear end of a harvester embodying my invention. Figs. 2 and 3 are detached elevations of my invention. Fig. 4 is a longitudinal section of the same. Fig. 5 is a section on line *x x*, Fig. 3. Fig. 6 is a detail. Fig. 7 is a plan view of a harvester embodying my invention. Figs. 8 and 9 are details.

A is the harvester-frame, and A′ the grain-platform.

B is the bull-wheel, which turns loosely on its axle P, which latter carries a pinion *p* on each of its ends, each of which is for engagement with a curved rack *a*, that is carried by the harvester-frame. On one end of axle P, between the pinion on that end and the bull-wheel, a sheave C is keyed to the axle and a cable D is secured at one end to the sheave, while its other end, after passing under another sheave *b*, that is attached to the lower end of the harvester-frame, extends up to a sleeve E, that has its bearings at *c c* on a shaft F, that in turn has its bearings at each end on the rear upper portion of the harvester-frame.

The sleeve E is formed with a flange on its surface, so as to make two sheaves *d* and *e*, the sheave *d* to take the rope or chain D, which lies in the spiral groove *f* and is secured to the sheave at *g*, and the sheave *e* to receive a rope or chain *b′*, one end of which is attached to the sleeve at *h*, and passing in a spiral groove *i* over onto sheave *e*, and from thence down to a sheave *k*, is led out around a sheave *m* on the rear outer corner of the harvester-platform to the lifting mechanism M on the outer end of the platform, which may be of any well-known and usual construction. This mechanism forms no part of my invention and may be of any approved construction. Near its farthest end from sheave *d* the sleeve E is provided with a hooked lug or pin *n*, and keyed to F and abutting sleeve E is another sleeve G, which is formed or otherwise provided with a lug or pin *o*, the lugs *n* and *o* being similar to each other but facing in opposite directions, and these lugs each anchor one end of a spiral spring H, which surrounds the adjacent ends of the sleeves G and E and joins the two, so that when the shaft F is turned the sleeve G, which turns with it, will also, through spring H, turn the sleeve E, and, as the harvester is suspended by ropes or chains D and *b′* from the sleeve E, its weight will be supported by the sleeve G through the spring H.

The operation of my device is as follows: When the machine is to be raised or lowered, the shaft F is revolved by means of a lever *j* and its ratchet-wheel J, and, acting through sleeve G and spring H, will revolve the sleeve E to wind up the ropes or chains D *b′*, the spring H yielding sufficiently to prevent shock and consequent strain on the frame, and the spring H also forming an elastic support for the machine as it is working.

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

1. The combination, in a harvester, of a bull-wheel, its axle, and the pinions and sheave carried by the axle, with racks fixed to the harvester-frame and receiving the pinions, a lifting-shaft carried by the harvester-frame, a fixed and loose sleeve carried by the shaft, a spring uniting the two sleeves, and a flexible connection having one end secured to the sheave and the other to the loose sleeve, substantially as described.

2. The combination, with the lifting-shaft and its fixed and loose sleeves and uniting-spring, of a flexible connection having one end secured to the loose sleeve and the other end secured to an arm of the lifting mechanism for the outer end of the grain-platform, substantially as described.

3. The combination, in a harvester, of a bull-wheel, its axle and pinions, a sheave carried by the axle, racks fixed to the harvester-frame and receiving the pinions, a lifting-shaft carried by the harvester-frame, a fixed

and loose sleeve carried by the shaft, a spring uniting the two sleeves, ordinary lifting mechanism on the axle of the grain-wheel, and flexible connections leading from the loose sleeve, one having an end secured to the sheave on the axle and the other having an end secured to the lifting mechanism of the grain-wheel, as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

HENRY F. CRANDALL.

Witnesses:
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STANLEY S. STOUT.