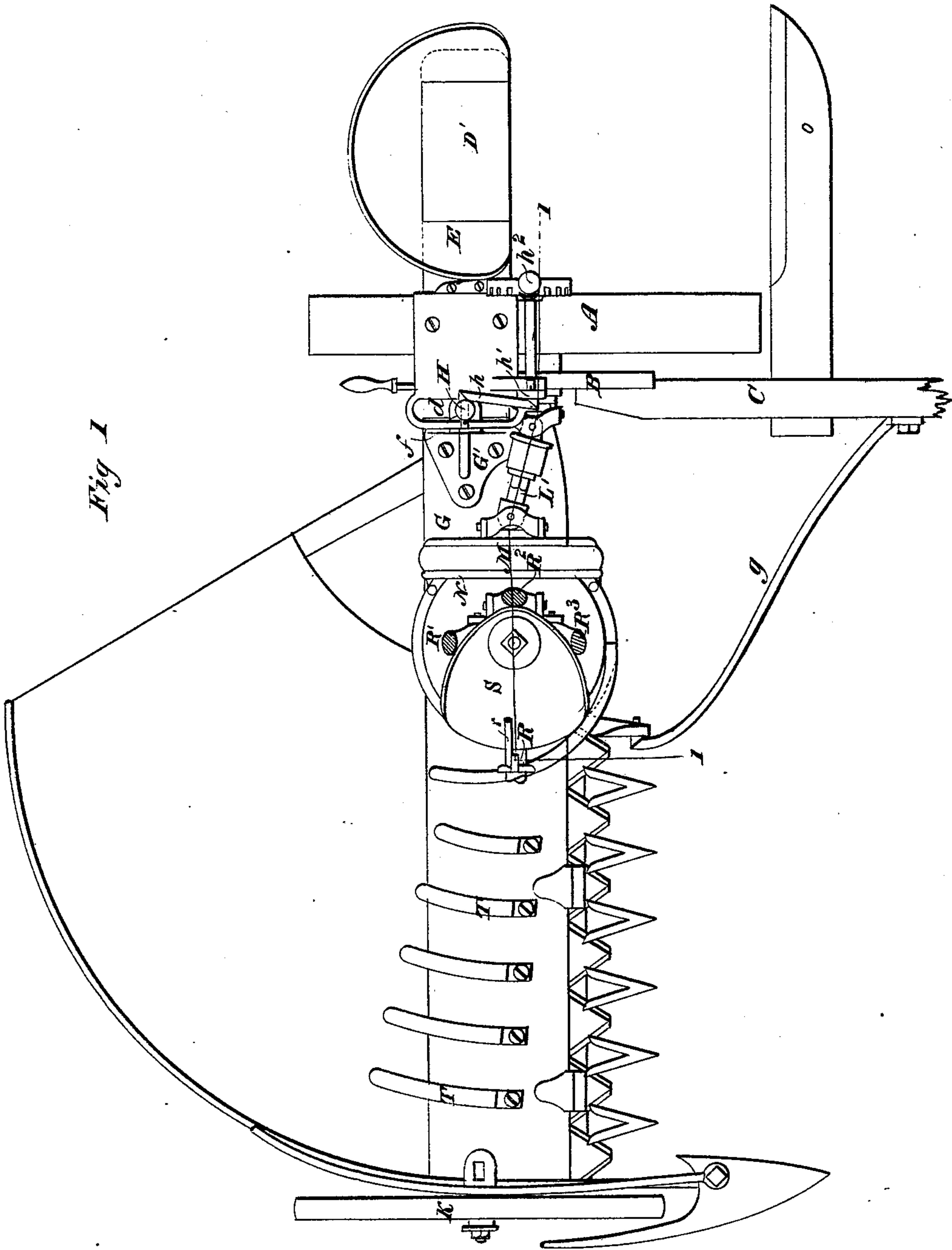


J. S. ROYCE.
Harvester.

No. 204,614.

Patented June 4, 1878.



WITNESSES

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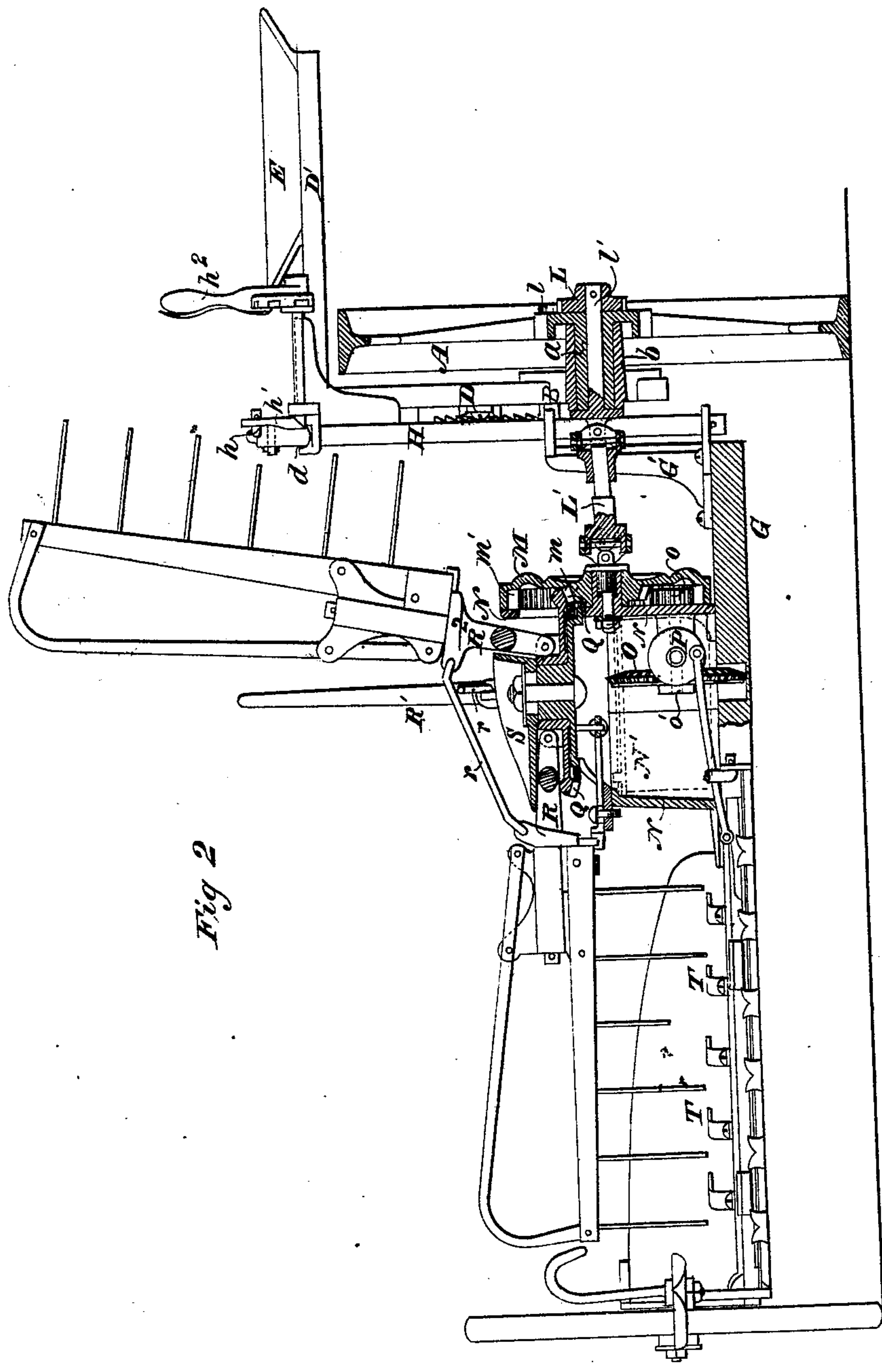


Fig 2

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Fig 3

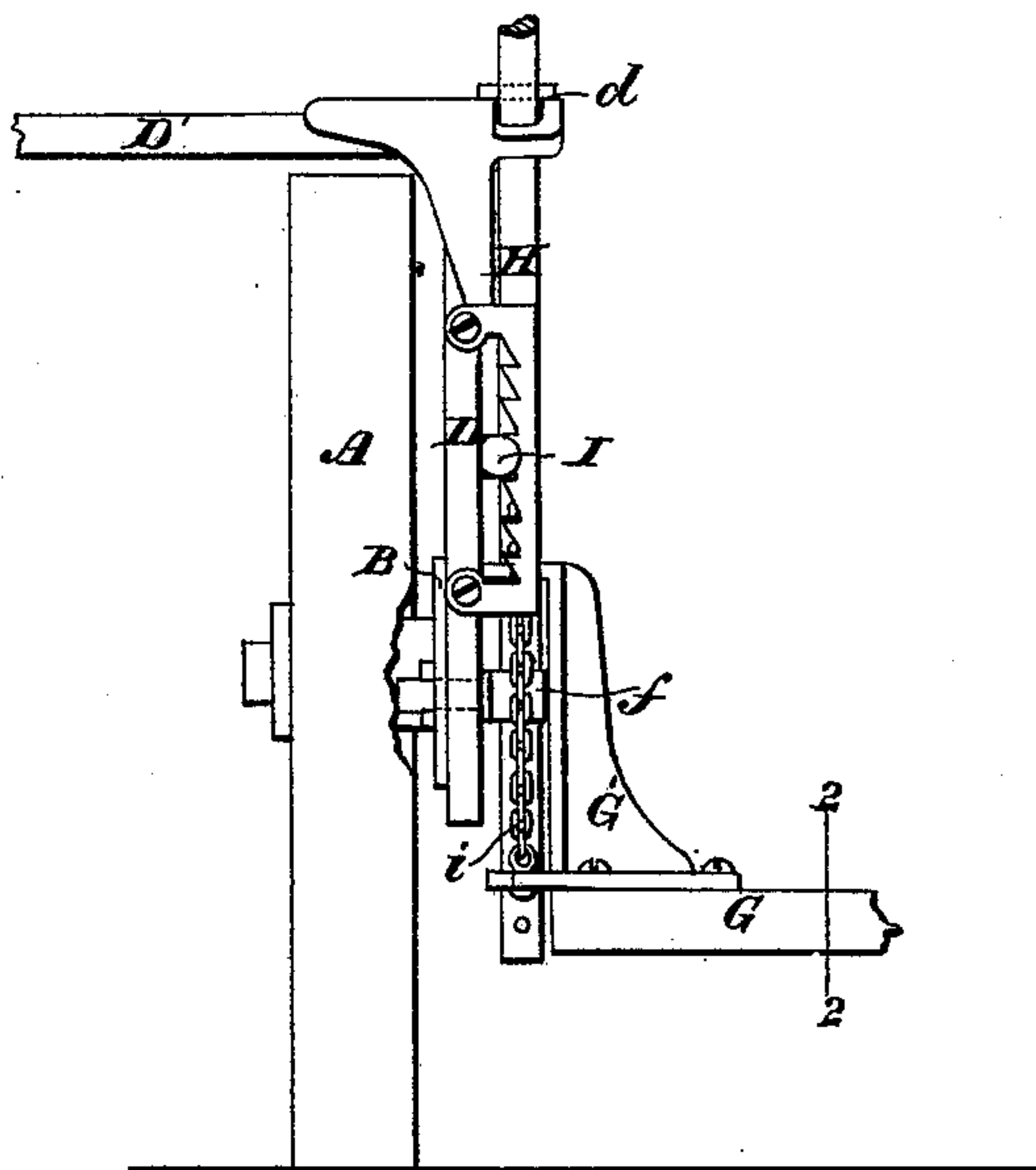
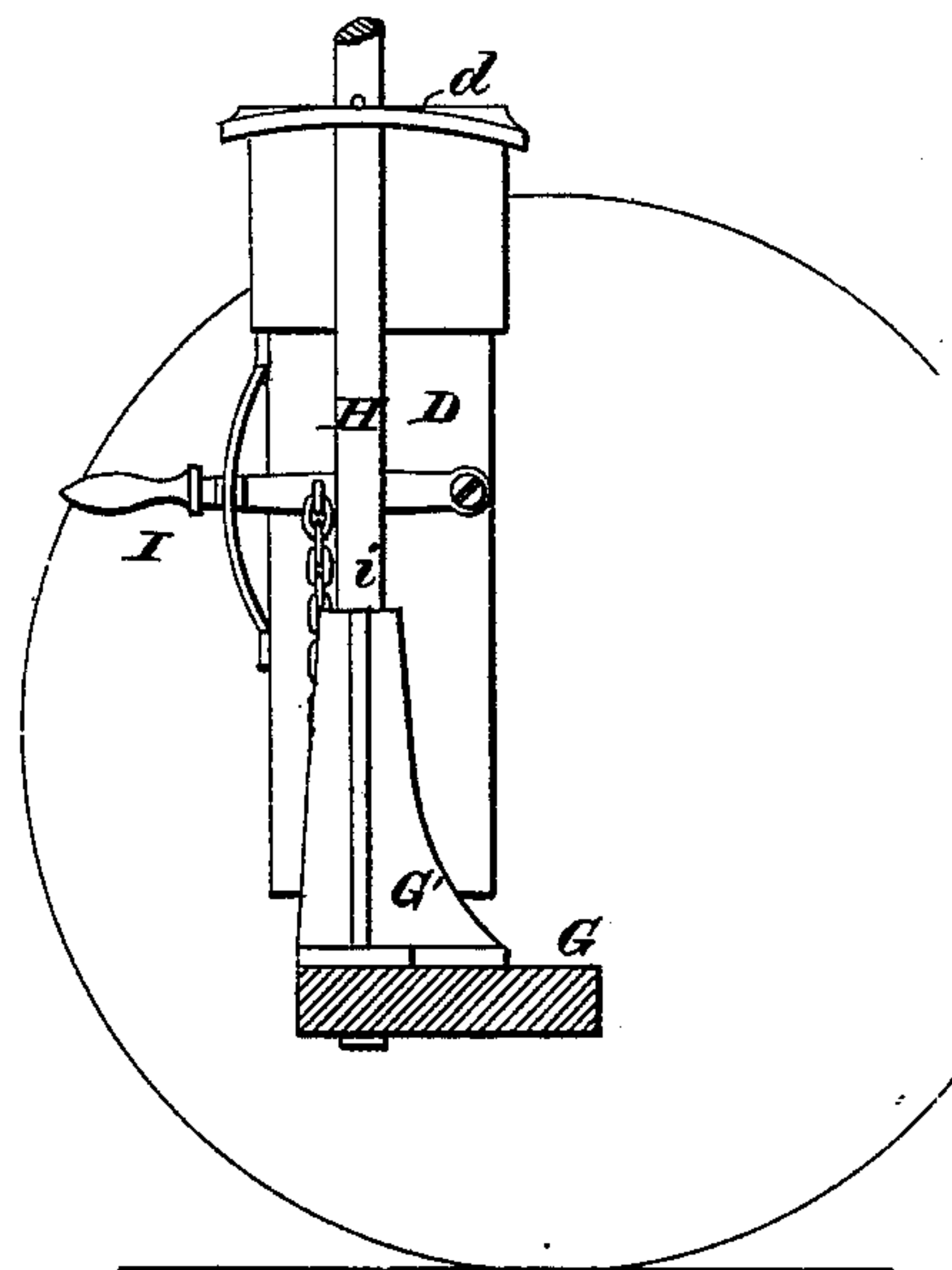


Fig 4.



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UNITED STATES PATENT OFFICE.

JOHN S. ROYCE, OF CUYLERVILLE, NEW YORK.

IMPROVEMENT IN HARVESTERS.

Specification forming part of Letters Patent No. 204,614, dated June 4, 1878; application filed June 2, 1876.

To all whom it may concern:

Be it known that I, JOHN SEARS ROYCE, of Cuylerville, in the county of Livingston and State of New York, have invented certain new and useful Improvements in Harvesters and Harvester-Rakes, of which the following is a specification:

My invention more especially relates to that class of harvesters having one driving-wheel, and constitutes an improvement upon the machine shown in Letters Patent of the United States numbered 148,326 and 148,327, granted to me March 10, 1874.

The subject-matter claimed is hereinafter specifically designated.

The accompanying drawings represent my improvements adapted to such a machine in the best way now known to me; but obviously some of them may be used without the others, and in machines differing in construction and organization from the one therein shown.

Figure 1 represents a plan, and Fig. 2 a front elevation, partly in section, on the line 1 1 of Fig. 1, of so much of my improved machine as is necessary to illustrate the subject-matter herein claimed; Fig. 3, a rear elevation, showing the inner end of the finger-beam and the devices by which it is adjustably connected with the drive-wheel and main frame; and Fig. 4, a section on the line 2 2 of Fig. 3.

The drive-wheel A has a tubular stud-axle, *a*, turning freely inside of a sleeve, *b*, forming part of the main frame-plate B, to which the tongue C is bolted at the level of the driving-axle.

A foot-board, *c*, mounted on the tongue, projects across the face of and beyond the drive-wheel. A post, D, secured upon the frame-plate inside of the driving-wheel, supports a horizontal beam, D', projecting over and beyond the driving-wheel, on which the driver's seat E is mounted. The driver is thus brought outside of the plane of the driving-wheel, so as to counterbalance the weight of the gearing.

A trunnion, *f*, rocks in bearings in the frame-plate B. A finger-bar, G, of well-known construction, carries on its inner or heel end a bifurcated bracket, G', through holes in which a vertical rod or rocking bar, H, passes, as well as through the rocking trunnion, thus uniting the finger-beam to the main frame.

The upper end of the rocking bar H plays backward and forward, in a plane parallel with the face of the driving-wheel, in the guide-slot *d* in the seat-frame. A link-rod, *h*, connects the upper end of this rocking bar with a rocking crank, *h*¹, mounted on the overhanging seat bar or support D', and controlled by a hand-lever, *h*², provided with the usual spring-detent, acting on a sector-rack on the seat-support.

In my patents above mentioned the finger-beam was rocked by a hand-lever attached directly to the top of the rocking bar; but as in the present arrangement the driver's seat is located farther outside of the driving-wheel than in the arrangement shown in those patents, the organization above described enables the driver to rock the finger-beam without having to reach over in an inconvenient position, where he might be struck by the rake-teeth in their revolution.

The finger-beam is raised and lowered by means of a chain, *i*, attached to the finger-beam and to a hand-lever, I, pivoted on the seat-frame post D, and held by the usual ratchet, the rocking bar H sliding freely endwise through its rocking trunnion to accommodate this movement. The bifurcated bracket also slides freely up and down on the rocking-bar.

The pressure of the cutting apparatus upon the ground may be varied by interposing a spring between the rocking trunnion and the upper member of the bracket, as shown in my patents above mentioned.

A drag-bar or brace, *g*, connects the tongue with the inner shoe of the finger-beam in a well-known way.

The divider end of the cutting apparatus is supported by an adjustable grain-wheel, K, adjustable in well-known ways. The axle of this supporting-wheel is in the same vertical plane as that of the driving-wheel. This part of the machine is fully described in my patents above mentioned, and need not be dwelt upon in detail here.

The driving-wheel A carries upon it a pawl, *l*, engaging with the ratchet L upon a short shaft, *l*', turning freely inside the tubular axle of the driving-wheel, and connected with and driving a tumbling-shaft, L', of well-known construction. This shaft drives a gear-wheel,

M, having a solid plate to exclude dust on one side, its open face working in close contact with the adjacent vertical portion of a frame, N, which supports the gearing and raking mechanism. This gear-wheel carries both an internal gear spur-wheel, m' , and a bevel-gear, m . The former engages with the spur-pinion o on a counter-shaft, o' , carrying a bevel-gear, O , and driving a bevel-pinion and crank-wheel, P , preferably cast in one piece, which drive the cutters by a crank and pitman, as usual.

It will be observed that the rake-supporting and gear-inclosing box-like or hollow frame N is mounted upon the finger-beam, so that all the parts partake of the movements of the latter.

It will also be noted that the crank-wheel and bevel-pinion P are located between the bevel-wheel O and the internal gear spur-wheel m' , directly underneath the rake-driving mechanism, being attached to the gear-frame and revolving on a stud-shaft, which, so far as I am aware, is a new and useful organization, as it keeps the crank-wheel and cutters in a uniform relation, which cannot be disturbed either in tilting, raising, or lowering the cutting apparatus, and also enables the pitman to be brought nearly down to the level of the cutting apparatus without liability to interference from the standing crops or from clogging matter.

The bevel-gear m , above described, upon the tumbling-shaft, drives the ordinary crown-wheel Q , upon which the reel and rake arms $R^1 R^2 R^3$ are mounted.

The general construction and arrangement of these rake-arms are similar to that shown in my Letters Patent above mentioned; but in this instance the rake-arms are connected together in pairs by links r , so that in passing around past the driver's seat the rakes and beaters are held up positively out of the way of the driver, and a lever or outside guideway or cam-track is dispensed with.

The rake-arms are combined with a single cam, S , located wholly above and inside of the pivots of the rake-arms, with links passing across and over the cam.

The gearing which drives the cutters, it will be observed, is protected by the combined frame and casing N , provided with a hinged door, N' , (see dotted lines, Fig. 2,) which permits access to the gear while excluding dirt and clogging matter therefrom.

A series of short spring teeth or bars, T , independently and rigidly secured at their respective front ends upon the platform or finger-beam just back of the cutting apparatus, and projecting horizontally backward over the platform, serve to hold up the falling grain, so as to enable the teeth of the rake readily to enter the fallen grain preparatory to sweeping it upon, over, and from the platform, which method I have found in practice to be a better way than to let the cut grain fall directly upon the solid platform itself.

The teeth, it will be observed, are curved horizontally to conform to the path traversed by the rake in sweeping over the platform.

I am aware that a series of long straight bars, similar to a dropper-platform, has been used with springs beneath to accommodate the movements of a rake revolving on a horizontal axis and sweeping over said bars, and do not claim such a device, which differs essentially from mine, in which I employ a series of short spring-teeth, independently but rigidly secured at their front ends to the platform or finger-beam, for co-operation with a combined reel and rake rotating on a vertical axis.

The operation of the machine will readily be understood from the foregoing description.

I claim as of my own invention—

1. The combination, substantially as hereinbefore set forth, of the sleeve on the main frame, the tubular axle of the driving-wheel turning in said sleeve, the driving-shaft passing through the tubular axle, the ratchet-connection between the driving-wheel and driving-shaft, the tumbling-shaft, and the gear-wheel mounted upon the finger-beam and driving both the rake and cutters.

2. The combination of the finger-beam, the frame mounted thereon, the gear-wheel carrying both an internal gear spur-wheel and a bevel-gear, the crank-wheel driving the cutters, and the crown-wheel upon which the reel and rake-arms are mounted, these members being constructed and operating substantially as hereinbefore set forth, whereby the crank-wheel and the reel and rake-arms are driven from the same gear-wheel and all are mounted on the finger-beam.

3. A series of short spring teeth or bars, T , constructed as described, independently and rigidly secured by their respective front ends directly to the platform or finger-beam just back of the cutters, and curved horizontally to conform to the path of a combined reel and rake, whereby the rake-teeth are enabled to strike deeply into the cut grain before sweeping it over the platform, from which it discharges it.

4. The combination, substantially as hereinbefore set forth, of a series of rising and falling combined reel and rake arms rotating on an axis substantially vertical, a platform over which the rake sweeps the cut grain to discharge it at one side of the machine, and a series of short spring teeth or bars independently and rigidly secured at their respective front ends to the finger-beam or platform just back of the cutters, and curved horizontally to conform to the path of the rake, whereby the rake-teeth are enabled properly to enter the fallen grain preparatory to sweeping it upon, over, and from the platform.

In testimony whereof I have hereunto subscribed my name.

JOHN S. ROYCE.

Witnesses:

TIMOTHY B. GRANT,
GEO. K. SMITH.