

(No Model.)

3 Sheets—Sheet 1.

C. C. BRADLEY.
HARVESTER.

No. 245,342.

Patented Aug. 9, 1881.

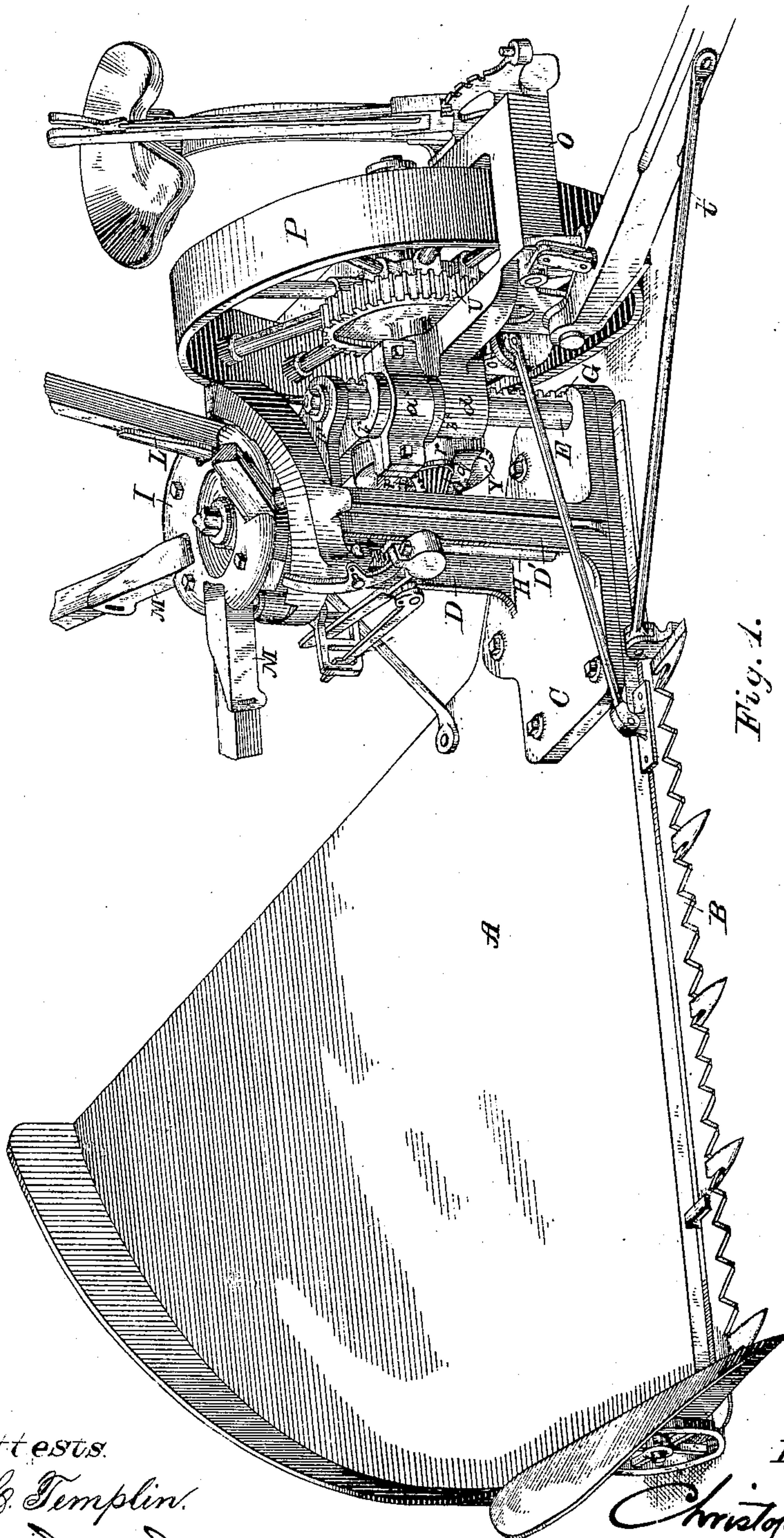


Fig. 1.

Attests.
J. B. Templin.
John D. Lacey.

Inventor.
Christopher C. Bradley.
By his Attorneys,
W. C. Strawbridge
J. B. Small Taylor.

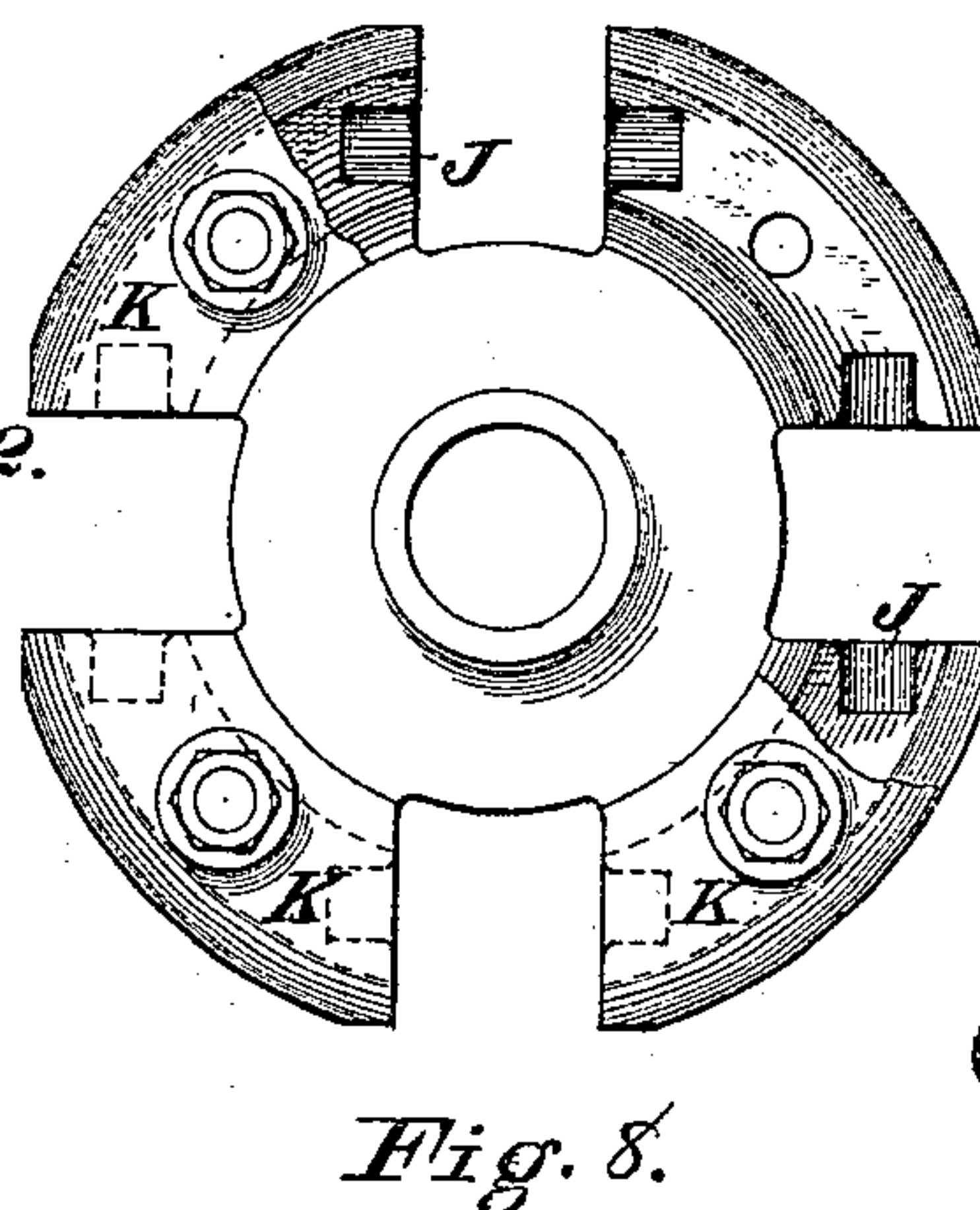
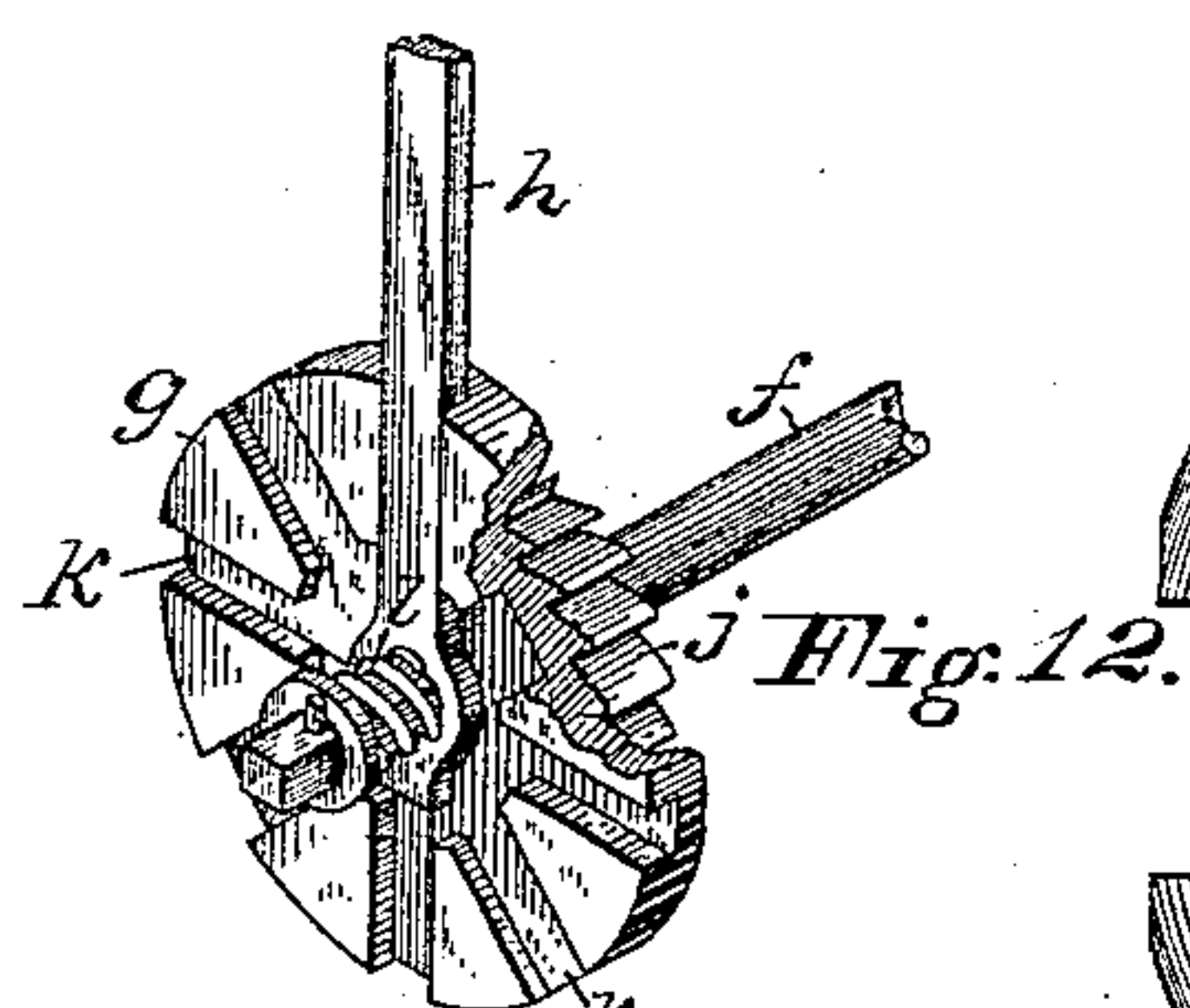
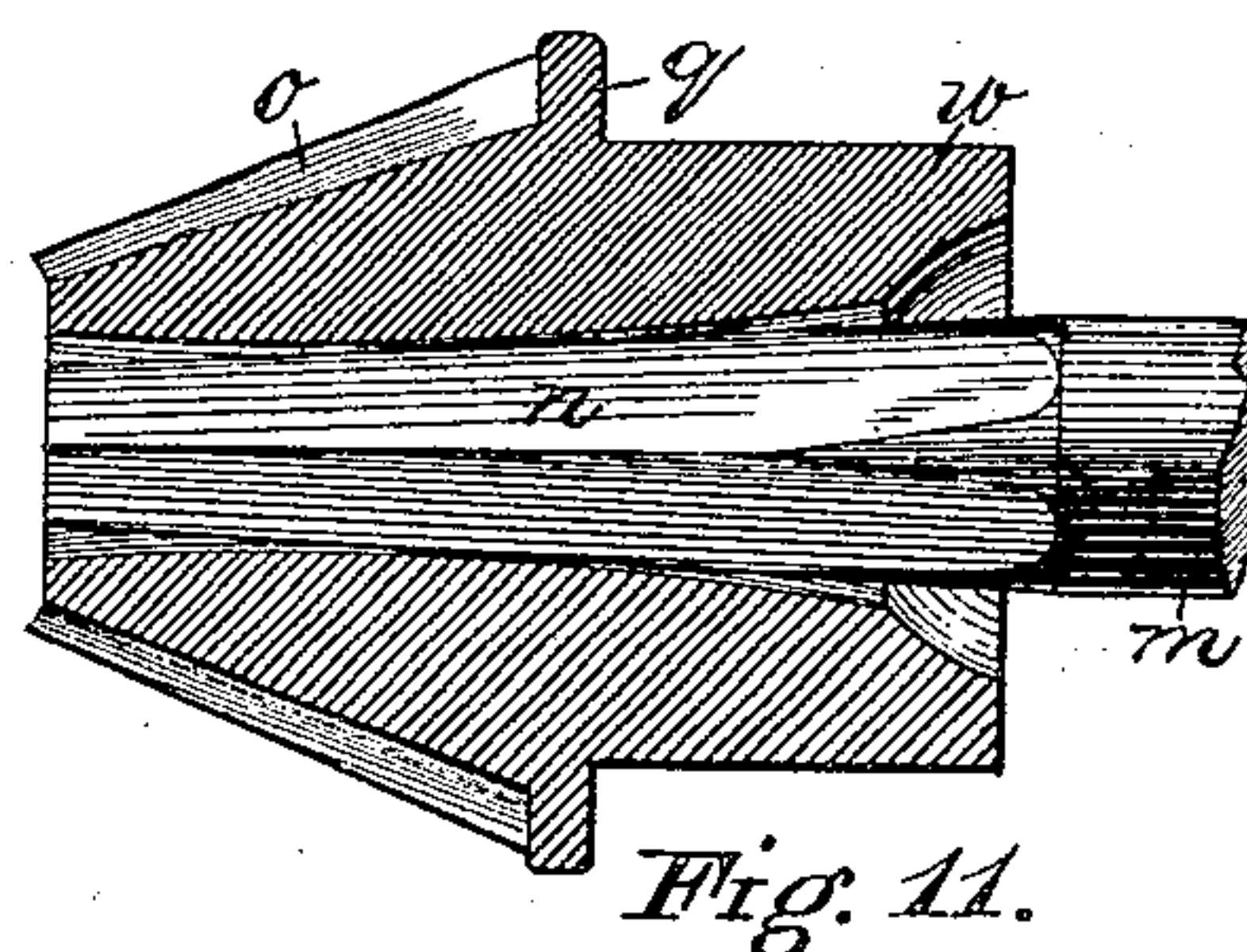
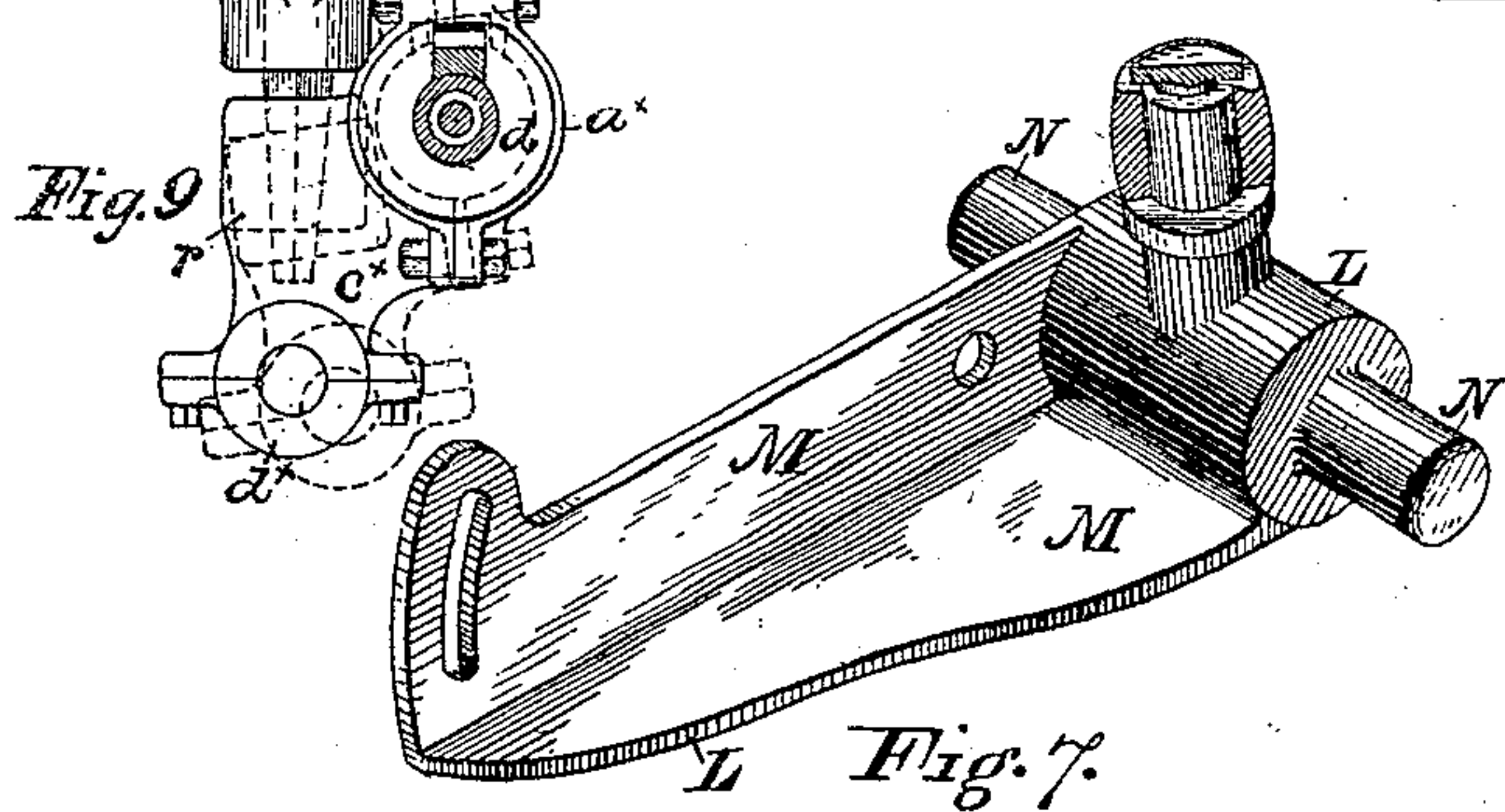
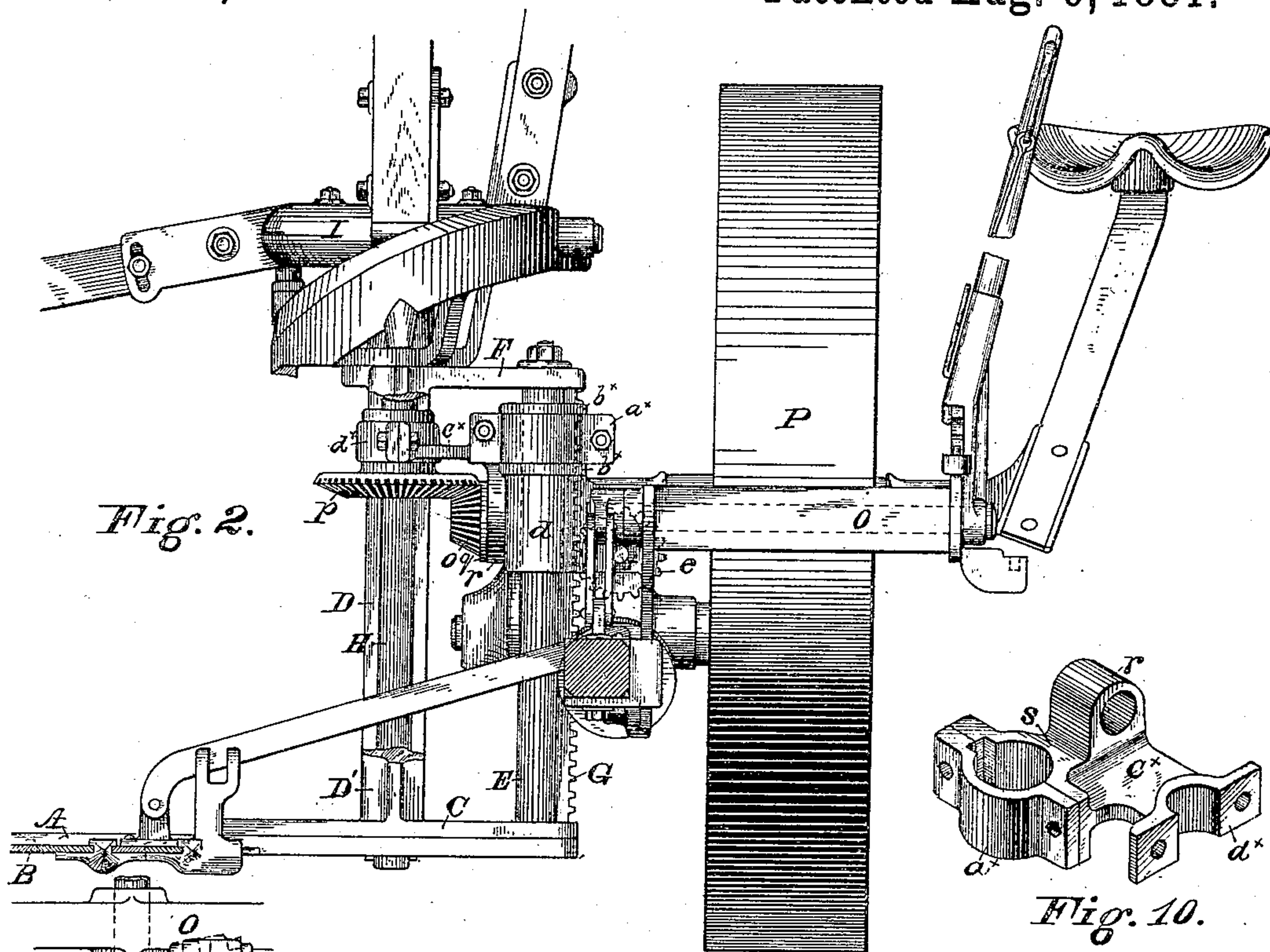
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Attests:
J. H. Templin.
John D. Cleyer

Inventor.
Christopher C. Bradley
By his Attorney
W. C. Strawbridge
J. Bonnell Taylor

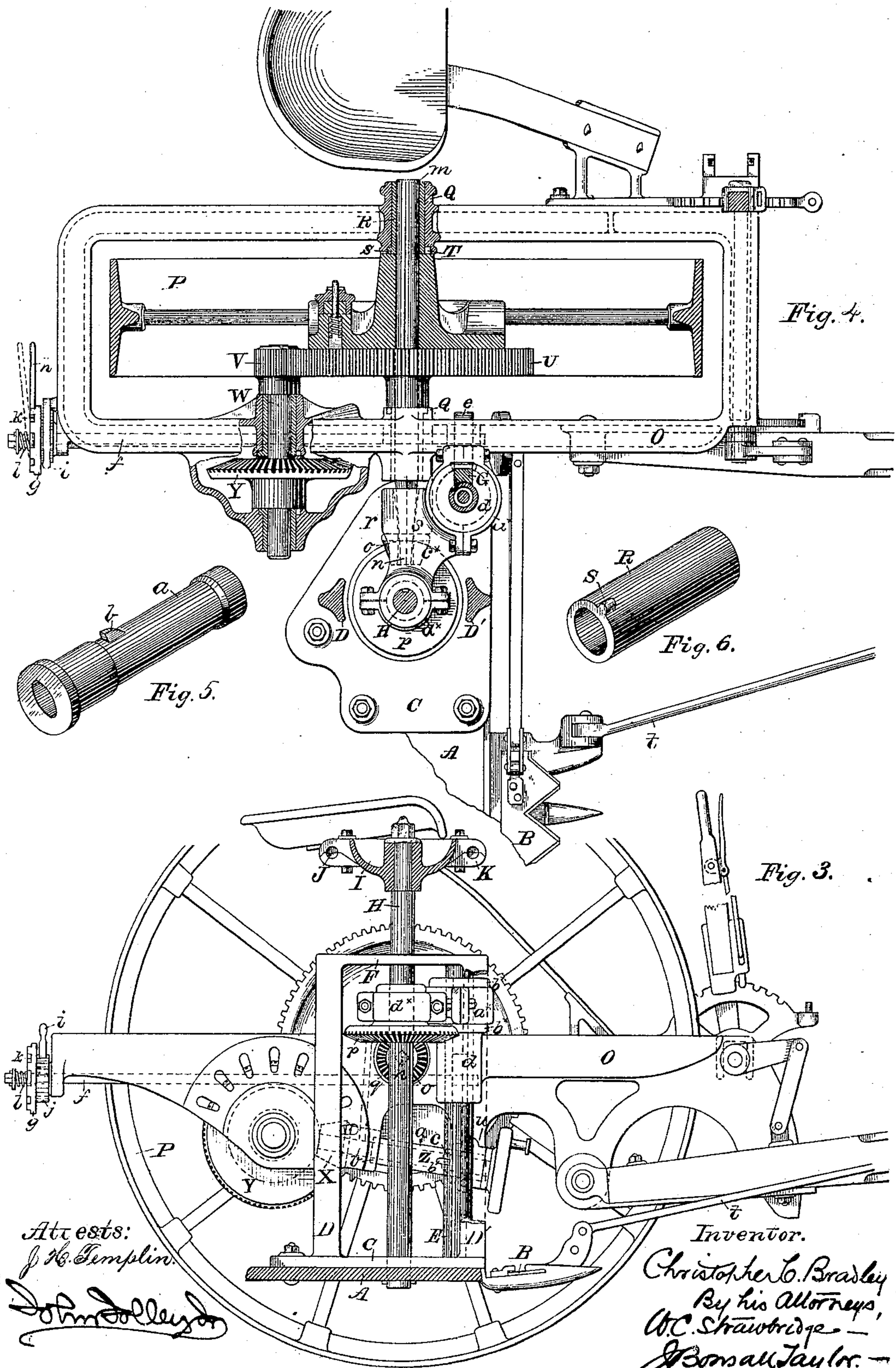
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3 Sheets—Sheet 3.

C. C. BRADLEY.
HARVESTER.

No. 245,342.

Patented Aug. 9, 1881.



UNITED STATES PATENT OFFICE.

CHRISTOPHER C. BRADLEY, OF SYRACUSE, NEW YORK.

HARVESTER.

SPECIFICATION forming part of Letters Patent No. 245,342, dated August 9, 1881.

Application filed January 15, 1881. (No model.)

To all whom it may concern:

Be it known that I, CHRISTOPHER C. BRADLEY, of Syracuse, New York, have invented a new and useful Improvement in Harvesters, of which the following is a specification.

This invention is an improvement upon the harvester invented by me, and patented to me in and by Letters Patent No. 236,209, dated January 4, 1881.

My present invention relates to the improved construction of the following parts, viz: the main frame, which is made of one piece of cast iron; the elevating device whereby the cutter-bar is raised or lowered, which is made both strong and simple; the means of attachment of the rake-head frame-work, rake-head, platform, and cutter-bar to the main frame, whereby a certain amount of horizontal play is allowed to such parts without the ungearing or displacement of the mechanism which drives said rake-head; and the rake-shoulder and rake-head, whereby the parts are made not to require hand-fitting.

In the accompanying drawings, Figure 1 represents, in perspective, a machine embodying my improvements. Fig. 2 is a front elevation of the same, the tongue being represented in section. Fig. 3 is a side elevation of the same, looking from the platform toward the drive-wheel, the rake-head being shown in central section and the platform being also in section. Fig. 4 is a top-plan view of the main frame, rake-head frame, and a portion of the platform and cutter-bar, section being taken centrally through the drive-wheel and its journals and through the bearings and housings of the minor axle, and being also taken below the rake-head. Fig. 5 represents, in perspective, an improved box for the crank-shaft, and Fig. 6 an improved bushing for the axles, which two devices are of my invention and constitute the subject-matter of a separate application for patent. The above-named devices are, for clearer comprehension of my present improvements, hereinafter described, but they constitute no portion of the subject-matter of this application, and in this application I disclaim them, claiming them in the separate application embracing them and above mentioned. Fig. 7 is an inverted perspective view

of the rake-arm shoulder and its trunnions; Fig. 8, an under view of the rake-head, showing partially broken away the cover-plates which retain the trunnions of the rake-arm shoulders in place. Fig. 9 is a top-plan detail of my oscillatory gear-frame, which carries the driving-gear of the rake-head, indicating in full lines its position when the cutter-bar is substantially at a right angle to the main frame, and in dotted lines, in an exaggerated degree, its position when the cutter-bar is forward of a right angle; Fig. 10, an inverted view, in perspective, of the gear-frame of Fig. 9, showing the recess or slot through which the rack which elevates the cutter-bar passes. Fig. 11 is a vertical longitudinal sectional detail of the bevel-pinion employed to impart motion to the crown-wheel which drives the rake-head, showing the interior conformation of said bevel-pinion and the tapered extremity of the driving-axle. Fig. 12 is a perspective detail of the ratchet-plate and spring-lever employed to operate the pinion of the lifting-rack.

Similar letters of reference indicate corresponding parts.

In the accompanying drawings, A represents the platform, and B the cutter-bar.

C is the base-plate of the rake-head frame-work, consisting of two uprights, D D', and of a round post, E, which are erected from the base-plate, and are connected together at their upper extremities by a yoke or bridge, F, substantially as in my former invention, except, however, that the post is provided upon its side which faces the drive-wheel with a rack, G. This post is entered within a vertical slide-bearing, d, which is attached to and projects laterally from the inside frame-bar of the main frame, and is capable of a vertical movement therein and also of a certain horizontal or pivotal play within the restraint of the brace t.

H is the driving-shaft of the rake-head, journaled in the rake-head frame-work, as shown; and I is the rake-head. This rake-head is constructed either of cast or malleable metal, of a form of which Fig. 8 is a bottom view—that is to say, with bearings J for the trunnions of the rake-shoulder cast partially into it and partially into quadrant-shaped cover-plates K, fitted to the under face of the rake-head, as

shown in Figs. 3 and 8, and secured in place thereto by means of bolts passing through said cover-plates and connecting each one of them rigidly to that portion of the rake-head which it is designed to incase. By the above construction I obviate all hand-fitting of the rake-head, and make it as a casting, which, with the cast cover-plates applied, serves every purpose of the old form of head, which required to have the rakes fitted to it by hand.

L is the rake-arm shoulder, of substantially the form shown in Fig. 7—that is to say, with two webs, M M, projecting at right angles to each other from the shoulder proper, and with trunnions N cast on either side of said shoulder. By this construction of the rake-arm shoulder with trunnions cast thereon I obtain every advantage incident to the old form of shoulder, which required to be drilled and fitted with pivot-pins. The rakes are applied to the rake-head by removing its cover-plates, placing the trunnions in the journal-bearings, and replacing and securing said plates.

O is the main frame, a casting of rectangular form, and of substantially the form represented. Within this frame is set the drive-wheel P by means of the axle *m*, journaled in the boxes Q, which contain bushings R, of substantially the form shown in Fig. 6—that is to say, provided on their inner face with a lug, S, which is fitted to take into a seat, T, upon the inner face of the journal-box. The object of this contrivance is to enable the ready removal of the bushing and its half or quarter rotation, in order to bring its lug successively into different seats, of which a given series may be formed radially in the journal. These bushings are applied from the inside of the journal-bearings before the road-wheel is set in place.

U is the driving spur-wheel, which has the usual ratchet-connection with the drive-wheel, and which gears with the driving-pinion V on the inner end of the minor axle W, the outer extremity of which carries the bevel-wheel Y, which imparts motion to the bevel-pinion X, which is keyed to and drives the crank-shaft Z.

In Fig. 5 I have represented an improved box, *a*, which I employ as a bearing for the crank-shaft. It consists in a journal-box, of substantially the form indicated in Fig. 5, the outer face of which is provided with a lug, *b*, designed to engage within a recessed projection, *c*, Fig. 3, formed upon the removable half of the casing *u*, which depends from the main frame and holds the forward end of the crank-shaft box *a* removably in place. By the employment of this contrivance I obtain a readily removable and therefore replaceable bearing for the crank-shaft, and one which is readily set in the machine and taken out by the removal or application of the removable half of the casing *u*, the rear extremity of the box being simply fitted into a properly-shaped hole, *v*, Fig. 3, in the casting or housing of the minor axle.

The connection of the main frame and rake-head frame, to which the platform and finger-bar are attached, is primarily (the tongue-brace *t* assisting) by means of the round post which passes through the vertical slide-bearing or post-hub *d*, laterally projecting from and attached to the inner side of the main frame. This post-hub is a hollow casting, vertically recessed upon the inner side, which is next to the main frame, in order to permit of the passage, vertical movement, and slight rotation of the rack which passes through it, and which is not rigidly connected with the round post, but is simply held in place in wide seats at top and bottom in the rake-head framework in such manner as to be capable of a slight rotation or lateral movement around and against the post. The combined device is in the nature of a hinge-connection between the main frame and the platform and its supported devices.

e is a pinion, Fig. 2, secured upon the forward extremity of a horizontal ratchet-shaft, *f*, Fig. 4, journaled, for instance, beneath the inner side bar of the main frame and passing out at the rear of said frame, at which point it is provided with a lever ratchet-plate, *g*, Fig. 12, and lever *h*, designed to enable the rotation of said shaft and its pinion *e*. A drop-pawl, *i*, Figs. 3 and 4, engages with a ratchet, *j*, upon the inner face of said ratchet-plate and prevents the recoil or movement of the shaft and pinion. The outer face of the ratchet-plate is provided with a series of radial lever-seats, *k*, in which the lever is adapted to be placed, a coiled spring, *l*, about the pivot of the lever enabling the angling of the same, and its placing in each of the seats in turn or in any one of them. By this device the pinion *e* is readily rotated, and by the rotation thereof, through the medium of the engagement of the pinion with the rack, the round post, rake-head frame, and cutter-bar are raised or lowered to the desired degree, the pawl *i* serving as a stop to the pinion, to retain the rack at the desired height.

m is the main axle of the road-wheel, which passes through the boxes Q in the main frame in the manner already described. It extends inwardly past its inside bearing in the main frame and terminates beyond said bearing in the form of a slightly-tapered pyramid, *n*, as shown in Fig. 11, and is at such extremity entered within a bevel-pinion, *o*, or "rocking pinion," as I term it, Figs. 4, 9, and 11, which engages with the bevel-wheel *p*, which is feathered upon and drives the rake-head shaft. A good form of this rocking pinion is shown in longitudinal section in Fig. 11. Its bore is not round, but is square, hexagonal, octagonal, polygonal, or of other irregular shape in cross-section, so as to fit closely over and be adapted for rotation by a correspondingly-shaped tapering extremity of the main axle, and on either side of its center the opening or bore enlarges, so that while the axle rotates it at any angle

which it can assume thereon, it is yet possible for it to assume varying angles, or to rock, so to speak, upon the axle. It is also provided at the base of its leaves with a circular head, 5 *q*, which acts against the base of the teeth of the crown-wheel, and thereby enables such teeth to retain the rocking pinion in its bearing *r* in the oscillatory gear-frame *s*, in which it is seated, by means of its shank or neck. This 10 oscillatory gear-frame is, when in place in the machine, a part of the rake-head frame-work, but is shown detached therefrom in Fig. 9 of the drawings. It consists of a journal-box, *a*^x, horizontally disposed and embracing the up- 15 per portion of the post-hub *d*, being retained in a fixed position vertically thereupon by means of the collars *b*^x. From this journal-box projects a web, *c*^x, upon the outer extremity of which is a second box or bearing, *d*^x, 20 which serves to support and retain in position for rotation the crown-wheel *p*, through which crown-wheel the rake-head shaft passes and is feathered, while depending downwardly from the bearings *a*^x is the seat or bearing *r*, in 25 which the shank or neck of the rocking pinion is seated and rotates.

It will be readily comprehended that in the absence of a restricting device, such as the tongue-brace, the rake-head frame-work, os- 30 cillatory gear-frame, platform, and finger-bar, hinge or pivot by means of the post about the post-hub on the main frame, so that a horizontal play or slight rotation is possible to the cutter-bar and platform, whereby the outer di- 35 vider can be placed backward or forward of its normal position at right angles to the main frame. When the tongue-brace is applied this action is of slight degree, but is nevertheless occasioned, to a greater or less extent, by the 40 tilting of the cutter-bar by means of the tongue-lever, tongue, and tongue-brace, and by the raising and lowering of the cutter-bar. By the construction of my rocking pinion this action of hinging horizontally is rendered possible 45 without strain or liability of damage to the gearing which drives the rakes, the rocking pinion retaining its fixed position relatively to the crown-wheel of the rake-head whatever may be the relative horizontal position of the plat- 50 form. No ungearing is requisite or occasioned; but the action is rendered safe and certain by the construction of the tapered extremity of the main axle and of the rocking pinion.

Having thus described my invention, I claim 55 and desire to secure by Letters Patent of the United States—

1. In a harvester, the combination of a rake carried upon the finger-bar or platform, the main axle set in bearings in the main frame

and provided upon its inner extremity with a 60 rocking pinion, and an oscillatory gear-frame provided with a seat for the rocking pinion and with the bevel-wheel that drives the rake-shaft, whereby a horizontal movement of the finger- 65 bar and platform with respect to the main frame is permitted.

2. In a harvester, the combination of a rake carried upon the finger-bar or platform, the main axle set in bearings in the main frame and provided upon its inner extremity with a 70 rocking pinion, a rake-head frame having both a vertical slide and a hinge-connection with the main frame, carrying the rake and connected with the finger-bar or platform, and an oscil- 75 latory gear-frame provided with a seat for the rocking pinion and with the bevel-wheel that drives the rake-shaft, said oscillatory gear-frame and rake-head frame being together adapted to permit of both vertical and horizon- 80 tal movements of the finger-bar and platform.

3. The oscillatory gear-frame *s*, mounted upon the post-hub, and provided with the bevel-wheel which drives the rake-shaft and with the rocking pinion which meshes therewith and is 85 driven by the main axle.

4. In a harvester in which the finger-bar and platform are connected with the main frame by a post-and-slide connection, a rack applied to or formed upon said post, in combination with a pinion located upon the main frame for rais- 90 ing and lowering said post and its attached finger-bar, platform, and rakes.

5. In a harvester in which the finger-bar and platform are connected with the main frame by a post-and-slide connection, the combination 95 of a rake carried upon said finger-bar and platform, the driving-axle provided with a rocking pinion adapted to rock thereon, a rake-shaft connected with said rake, and provided with a bevel-wheel feathered thereon and engaging 100 with said rocking pinion so as to be actuated thereby, substantially as shown and described, and for the purpose specified.

6. A bevel-pinion having a square, hexagonal, polygonal, or irregularly-shaped bore, en- 105 larging in diameter from its center outwardly in both directions, and fitted upon the tapering end of the main axle having a corresponding cross-section, in combination with a bevel-wheel actuating the rake-head, whereby a hori- 110 zontal movement of the finger-bar and platform in relation to the main frame is permitted.

In testimony whereof I have hereunto signed my name this 15th day of December, A. D. 1880.

CHRISTOPHER C. BRADLEY.

In presence of—

J. BONSALE TAYLOR,
C. B. TAYLOR.