

O. KROMER & F. RINKLEFF.
Harvester.

No. 225,064.

Patented Mar. 2, 1880.

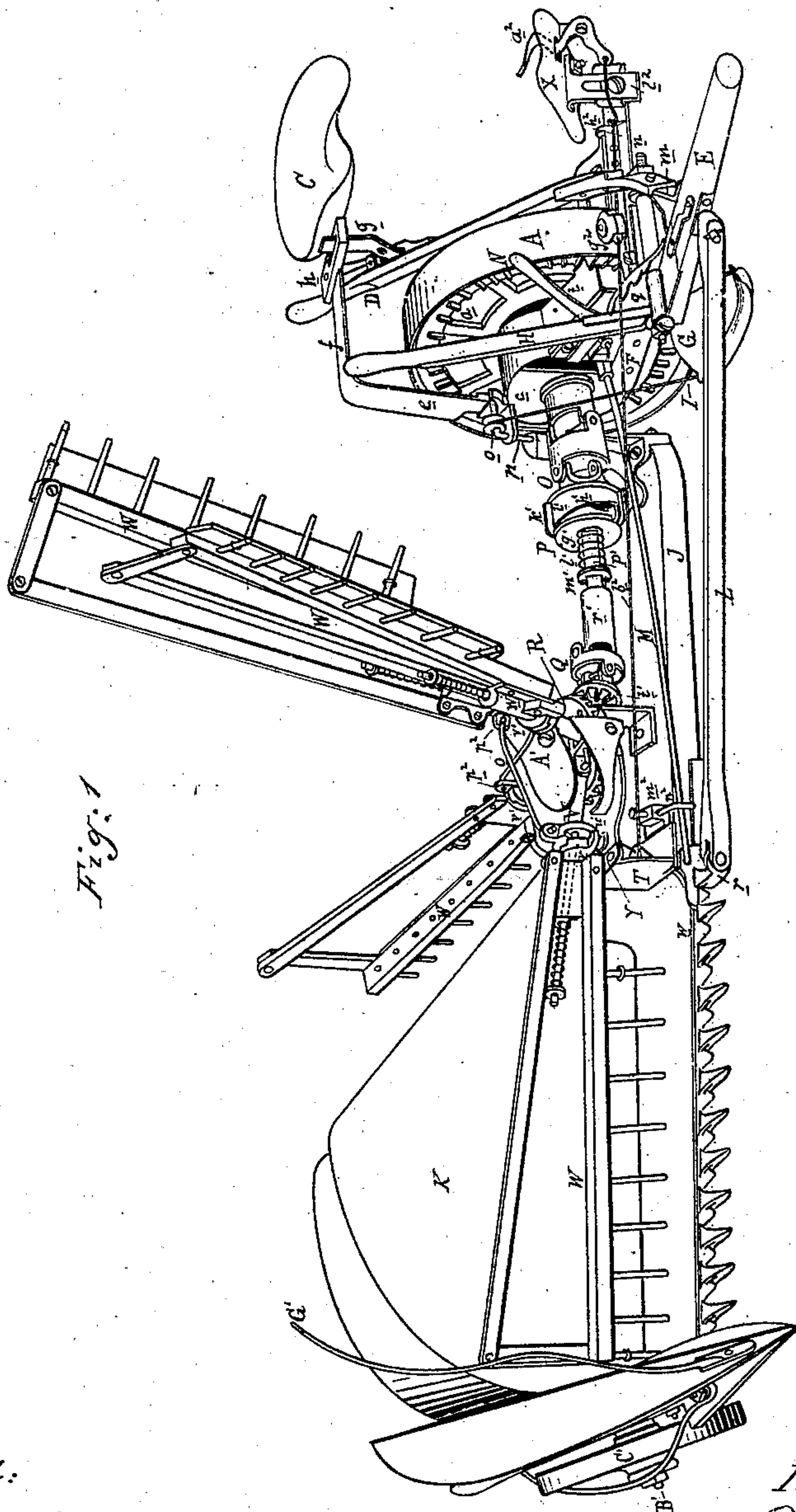


Fig. 1

Attest:

A. Barthel
Charles J. Hunt

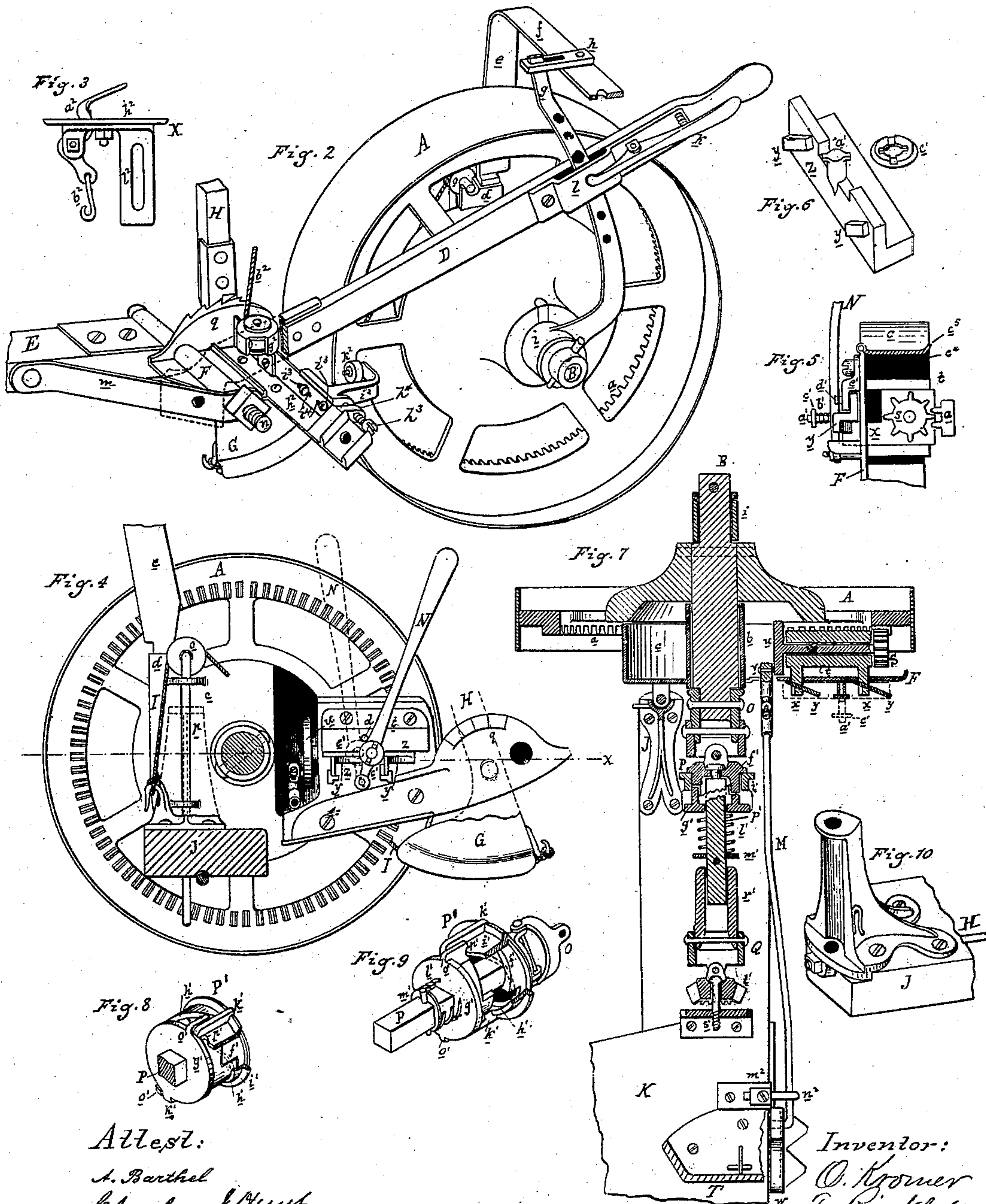
Inventor:

O. Kromer
F. Rinkleff
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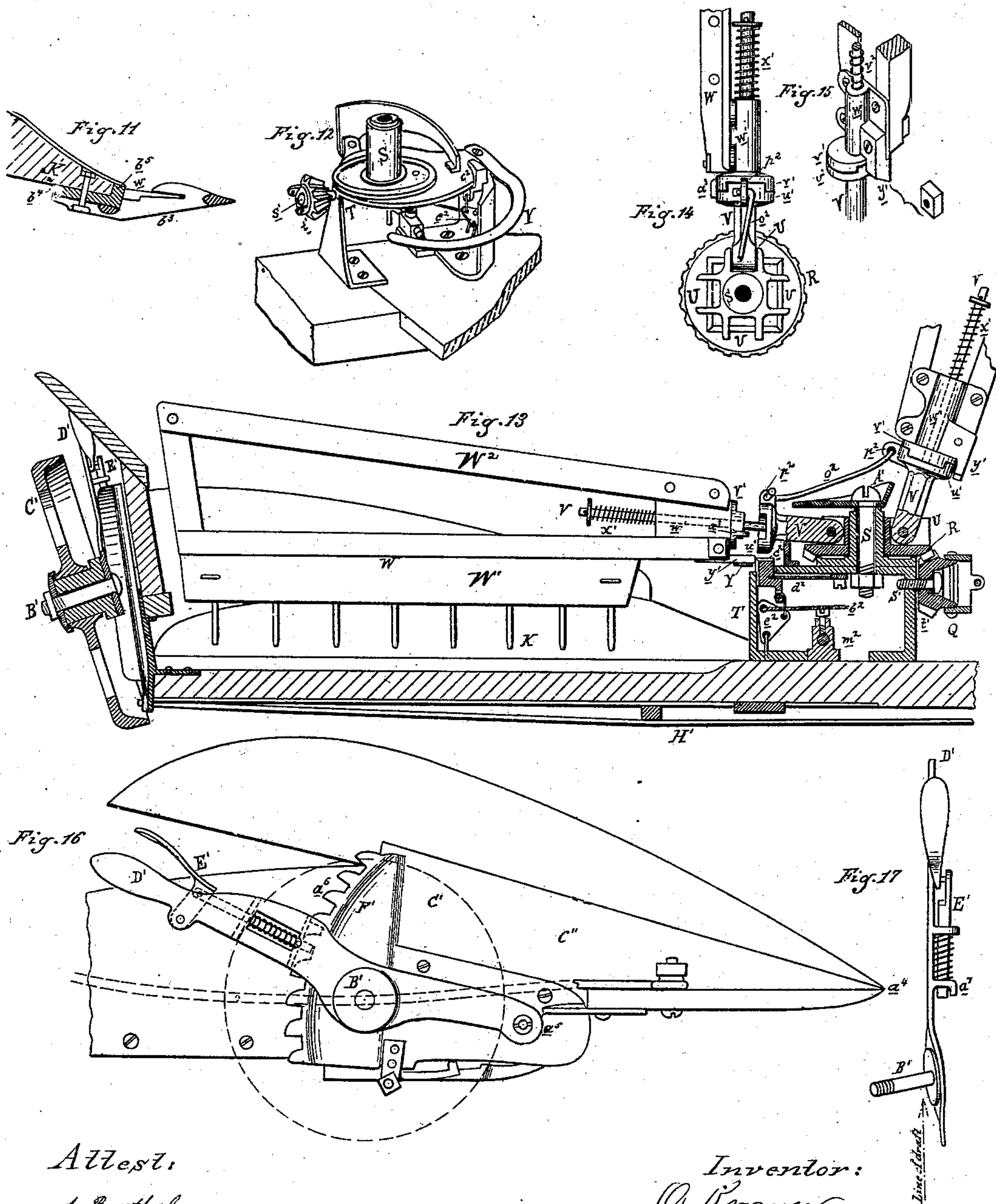
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UNITED STATES PATENT OFFICE.

OTTO KROMER AND FRANK RINKLEFF, OF SANDUSKY, OHIO.

HARVESTER.

SPECIFICATION forming part of Letters Patent No. 225,064, dated March 2, 1880.

Application filed February 25, 1879.

To all whom it may concern:

Be it known that we, OTTO KROMER and FRANK RINKLEFF, of Sandusky, in the county of Erie and State of Ohio, have invented an Improvement in Harvesters, of which the following is a specification.

The nature of our invention relates to new and useful improvements in that class of machines employed in harvesting grain, by means of which the grain is cut, deposited upon the platform, and raked therefrom in gavels of any desired size, at the will of the operator.

The invention consists of the peculiar construction of the parts in detail and their various combinations, as more fully hereinafter described.

In the drawings, Figure 1 is a perspective view of our improved harvester, showing the arrangement of the operating parts. Fig. 2 is a detached perspective view of the driving-wheel, tilting-lever, and manner of fastening the whiffletree to the main frame. Fig. 3 is a like view of the foot-board with the foot-trip for controlling the motions of the rake. Fig. 4 is an inside elevation of the driving-wheel, showing, in connection with Figs. 5, 6, and 7, the manner of communicating motion to the cutter-bar, and also the mechanism for throwing the cutter-bar in and out of gear. Fig. 5 is a side elevation of the box containing main-wheel pinion and cutter-bar crank. Fig. 6 is a detail of the same. Fig. 7 is a horizontal central section through the main driving-wheel and its gear-connections, showing the devices for allowing the cutter-bar to rise and fall; also, for controlling the motion of the rakes and the details thereof; also, the construction of the crank-pin and pitman-head. Figs. 8 and 9 are perspective views, showing the device for coupling and uncoupling or throwing into or out of gear the rakes. Fig. 10 is a perspective view of the platform-standard. Fig. 11 is a cross-section through the guard and cutter-bar, showing the method of connection to the table. Fig. 12 is a perspective view of the rake-head, showing the devices for tripping, locking, and unlocking, raising and lowering, the rake-arms and rolling the same. Fig. 13 is a vertical central section through the rake-head, platform, and axis of grain-wheel, showing the operation of the trip for locking and unlocking the rake-

arms, and construction and position of the grain-wheel and its connection with its shaft. Fig. 14 is a plan view of the rake-head, showing the relative positions of the rake-arms. Fig. 15 shows the lug on the rake box or head of rake-arm. Fig. 16 is an elevation, showing the devices employed for adjusting the height of the platform. Fig. 17 is a plan view of the grain-wheel lever and its connections.

In the accompanying drawings, which form a part of this specification, A is the main driving-wheel, suitably and rigidly secured upon the axle B. In the drawings this wheel is shown as composed of a tire shrunk upon a skeleton wheel, the inner face of the rim of which is provided with a series of uniform teeth, *a*. This peculiar construction is not essential, as the wheel may be cast solid, if desired. The inner end of this axle is covered by a sleeve, *b*, in which the axle turns, and which is incased in the shield *c*, to which is secured the socket *d*, into which is inserted the riser *e*, which terminates in a spring bearing-arm, *f*, to the outer end of which the seat C is secured. To the arm *f* is secured the slotted guide *h*, through which the upper end of the perforated segment-bar *g* plays, the opposite end of said bar being secured to the sleeve *i* upon the outer end of the axle B.

D is a lever provided with an embracing-plate, *l*, to embrace the segment-bar *g*, and has pivoted to it the spring-lever and pin *k*, by means of which and the engagement of said pin with the perforations in said bar the tongue E may be elevated or lowered, as desired, by the driver upon the seat. To enable this to be done, the forward end of the lever D is rigidly secured to the brace *m*, which, as well as the tongue E, is pivotally secured to the bolt *n*, which secures said brace and the tongue to the plate F, which extends rearward, on the inner side of the main driving-wheel, and is secured to the case or box *c*.

H is a lever pivoted to the inner face of the ratchet, (which is secured to the plate F,) and has secured to its lower end the segmental shoe G, the lower end of which is grooved to receive and guide the chain I, which is so secured to said shoe that a partial rotation thereof by the movement of the lever H will lengthen or shorten the chain, which passes

upward and rearward over the grooved pulley *o*, and thence downward to the heel of the sway-bar *J* of the platform *K*, which is pivotally secured to the vertical rod *p*, which, in turn, is pivotally secured to the case or box *c*, and to the bent upper end of this rod the pulley *o* is journaled. The end of the chain *I* being secured to the heel of the sway-bar *J*, a forward or rearward throw of the lever raises or lowers the inner end of the platform *K*, and it is locked in position by engaging said lever, in the usual way, with the ratchet *q*.

The diagonal brace *L* is pivotally secured to the tongue *E* at one end, and at the other end it is also pivotally secured to the nearest finger or knife-guard *r*, which is so constructed as to allow such connection to be made, and by this brace and the operation of the hereinbefore-described lever *D* and its connections the movement of the tongue *E*, when the machine is in use, is communicated to the platform to tilt the front thereof to any desired pitch or to throw such platform *K* to a horizontal position, as required.

A pinion, *s*, engaging with the teeth *a* of the main driving-wheel, and suitably journaled in the box *t*, which is secured to the case or shield, gives motion to the crank-wheel *w*, which, by the wrist-pin *v*, is pivotally attached to the pitman *M*, by means of which a reciprocating motion is communicated to the knife-bar *u*. This box *t* is so secured as to be susceptible of a sliding motion in and out to disengage the pinion *s* from the teeth *a* when it is desired to stop the reciprocating motion of the knife-bar. This is accomplished by means of the lugs *x* on the box, and which are provided with diagonal slots, through which pass the diagonal or inclined lugs *y* upon the slide *z*. Projecting outwardly from this slide is a shaft, *a'*, upon which the lever *N* is fulcrumed, with its lower end pivotally secured to the side of the frame *F*. On said shaft, outside the lever, is placed a spring, *b'*, held in place by the washer *c'*, to compel said lever to remain in contact with the outer face of the slide, and a lug, *d'*, projects from the face of the clamp-plate *e'* to hold the lever in position to the front or rear.

To engage the pinion the operator pushes the lever away from the face of the slide, compressing the spring in so doing, until the lever can be made to pass the lug, and this motion and throwing the lever in front of said lug forces the box toward the main driving-wheel, carrying the shaft, crank-wheel, and pinion with it, until the pinion engages with the teeth *a*. A reverse of this motion, carrying the lever to the rear of the lug, withdraws the box, shaft, crank-wheel, and pinion, until the latter disengages from said teeth.

It will be noticed that this method of engaging and disengaging the pinion keeps the parts and the pitman always in line, while if the pinion were simply moved to and fro for such purpose the shaft and pitman would be thrown out of line.

To the inner end of the shaft *B* is secured a universal joint, *O*, of the usual or any desired construction, and to this joint is pivotally secured the clutch *P*, which is constructed in two parts, *f'* and *g'*, the former being pivotally secured to the universal joint, as described, and constructed as follows: It is provided with two inclined faces, *h'*, upon the inner edges of the ring *i'*, and the outer face or periphery of the ring is provided with two lugs, *k'*, placed opposite each other. This ring is sleeved upon the part *f'* of the clutch which forms a part of the universal joint, and the inner edge of this part *f'* is provided with the ratchet-teeth usually found in clutches. The part *g'* is also provided with the usual ratchet-teeth to engage with the similar teeth upon the part *f'*, and when so engaged the part *g'* is hidden within the ring *i'*, and such engagement is enforced by the spring *l'* and a fixed washer, *m'*, secured to the square shaft *P'*, upon which the clutch operates. This part *g'* is also provided with lugs *o'*, placed opposite each other, and when the two parts *f'* and *g'* are disengaged, by giving the sleeve *i* a half-turn by hand the lugs upon the latter impinge upon the lugs of the ring *i'*, as shown in Fig. 9, and the inner edges of these lugs impinge against the inclined face of the ring, to prevent the spring from engaging the two parts of the clutch; and to render this more certain the inclined faces of the ring are slightly cut away, as at *p'*, forming a notch to engage with the end of the lugs on the part *g'*, which prevents accidental displacement of the parts.

That part of the shaft upon which the part *f'* is placed is round, while the rest of its length is square and enters the sleeve *r'*, which, by means of the universal joint *Q*, is pivotally secured to the pinion-shaft *s'*, upon which the bevel-pinion *t'* is secured. This pinion communicates motion, by engaging with the bevel-gear thereon, to the revolving rake-head *R*, which is suitably journaled upon the vertical shaft *S*, which is secured to a step, *T*, rising from the heel of the platform *K* and from the sway-bar. A plan view of this revolving rake-head is shown in Fig. 14, and it is provided with four pairs of ears, *U*, each pair being at right angles to the pairs on either side, and between each pair of these lugs there is pivotally secured an arm, *V*, and to each of these arms there is pivotally secured a rake, *W*, in the following manner: Upon each of said arms there is a clutch formed of two parts, *w'* and *v'*, the former of which is rigidly secured to the arm, while the latter is sleeved thereon, and has secured to it a thimble-plate, *w'*, and between the outer end of said thimble-plate and a washer on the end of said arm the latter is surrounded by a coil-spring, *x'*, to keep the two parts of the clutch in engagement, except when forcibly disengaged, as hereinafter described. To this plate is attached a lug, *y'*, which may or may not be made removable, and its purpose is to cause the rake to rake off the platform at every revolution or not, as desired.

By being brought into contact with a trip operated from the foot-rest of the operator, the lug will disengage the clutch upon each arm as in its rotation it reaches the front of the platform K, and the rake will roll and not rake off.

If the operator desires that one of the rakes should perform its function of raking off the platform, he, when such rake reaches the proper point, places his foot upon the double bell-crank lever a^2 , which is pivoted and passes through a slot in the foot-rest X, and this bell-crank, being connected by the chain b^2 with the trip c^2 , withdraws the same when the rake performs its functions, and, the operator relieving the pressure upon the bell-crank, the trip resumes its position, and the succeeding rakes will roll and pass over the platform without raking off the grain thereon; or if the grain is very heavy, so that each or every alternate rake is required to rake off, then, to avoid the necessity of operating the trip, each lug or each alternate lug y' may be removed. A spring, d^2 , compels the trip to resume its position after the pressure is relieved from the bell-crank. This trip c^2 , at its lower end is connected by a chain or rod to the triangular bell-crank plate e^2 , and a chain, b^2 , leads thence, over the pulley g^2 , to the bell-crank a^2 at the foot-board. This latter is secured to an extension, h^2 , of the frame F, to which is secured the arm i^2 , carrying the friction or bearing wheel k^2 , which travels against the outer face of the main driving-wheel, to prevent the latter from being thrown out of line when the cutter-bar-driving mechanism is thrown into or out of gear with the inner face of said driving-wheel, as hereinbefore described. This arm i^2 is adjustably secured to the frame F, so that the pressure of the wheel k^2 against the main driving-wheel may be regulated as required.

The arm i^2 is secured to the extension h^2 of the frame F by bolts i^3 , passing through slots i^4 of the extension h^2 , so that the arm can be adjusted thereon. This adjustment is effected when the bolts i^3 are loosened by means of a set-screw, h^3 , turning through a nut-lug, h^4 , projecting from the extension h^2 , by turning which set-screw the arm i^2 and wheel k^2 are moved back and forward. The set-screw h^3 takes most of the thrust of the driving-wheel.

The foot board or rest X is secured to the extension of the frame F by means of the slotted bar l^2 and a set-screw or clamp, so that the same may be vertically adjusted to suit the varying length of the legs of different drivers.

A plate, m^2 , is removably secured to the heel of the platform K, and to this plate is secured a removable hook-clamp, n^2 , for the purpose of preventing the pitman M from being accidentally disconnected from the cutter-bar.

It will be noticed that the rake-head is provided with the four arms, as described, standing at right angles to each other, so that each pair projects on the same horizontal line, but in opposite directions, and each of these pairs is connected together by rods o^2 , engaging with the lugs p^2 on the fixed parts u' of the

clutch, so that one arm balances its fellow, and so that when one arm stands vertically its fellow will project horizontally, and so that the relative positions of said arms will always be maintained. In the rotation of the rake-head, and when it is not desired to have it rake the grain from the platform when the rake passes to the rearward from the front of the platform, the lug y^2 strikes the trip c^2 , which causes the part v' to disengage from the part w' of the clutch when the rake is partially rotated, and, as the rake continues its travel its side slides on the segmental spring Y, which has an upward and rearward incline and inward curvature, as shown in Fig. 12. This motion rolls the rake in a nearly horizontal position, as it is secured to the thimble plate w' for that purpose, and the thimble-plate is prevented from turning or rolling completely over by a projecting lug, a^3 , on the part v' of the clutch, engaging with the lugs p^2 upon the part w' , so that after the rake has partially rolled the revolving part of the clutch will slide the balance of the length of the spring Y, and when it passes the end of said spring the weight of the rake (it being eccentrically hung for that purpose) will compel it to roll in the opposite direction until the proper parts or faces of the two parts of the clutch are brought into the proper position, when the spring x' will cause them to engage.

If it is desired that the platform be raked off, the trip c^2 is withdrawn by the pressure of the driver's foot, as hereinbefore described.

A' is a cam, such as is usually employed, below which the rake-head revolves and around which the rake-arms revolve in the usual manner.

B' is an axle secured to the grain end of the platform K, so that the wheel C' will stand in an inclined position, as shown, to bring its lowest point within the line of the point a^4 of the grain-divider C'', and also by having it slightly converge toward the line of draft to counteract the tendency to side draft. This axle B' is secured to said platform in the following manner: D' is a lever, pivoted at a^5 to the end of the platform, and to the outer face of this lever the axle B' is rigidly secured. The lever is provided with the spring latch or bolt E', which engages with any one of the notches or teeth a^6 upon the segmental rack-bar F', which is secured to the grain end of the platform. By these means this end of the platform may be raised or lowered, as desired.

To prevent the free end of the lever D' from spreading away from the machine, said lever is provided with a clamp-plate, a^7 , which embraces the edge of the rack-bar and holds the parts together without interfering with their legitimate operation.

G' is a spring-rod, one end of which is secured to the inner face of the divider-point, and its free end curves upwardly, rearwardly, and inwardly from the divider-board sufficiently to allow the rake to pass under it. This allows the end of the rake to sweep the platform clear to said divider-board, and at

the same time prevents the overhanging un-cut grain from interfering with the operations of the rake, or to impede the raking of the cut grain from the platform.

5 H' is a truss-rod, suitably secured at each end, and passing under the front part of the platform, to prevent the same from centrally sagging under any circumstances.

10 In Fig. 11 there is shown our improved manner of securing the knife-guards to the platform K. This has usually been done by securing the heel of the knife-guards to the front of the platform, and this being of wood, such knife-guards, so attached, are very liable to become loosened by the abrasion of the wood, 15 which, at this point, is liable to dampness when in operation from the grain being cut near the ground. To remedy this difficulty, and to more rigidly secure the knife-guards b^3 , 20 we secure an angle-iron shoe, b^4 , to the under side of said platform and along its front edge, and with the flange b^5 covering said front edge, and we secure the knife-guards to this angle-iron, substantially as shown.

25 When the harvester is in operation the exposed ends of the cogs a of the main driving-wheel A take up dirt and dust, which, if carried to the pinion s and its shaft and journal-box, would cause rapid wear. To remedy this 30 we place a cover, c^4 , over that portion of the shield c where an opening is left through which to reach the inclosed mechanism, and the inner edge of this hinged cover is provided with a scraper, c^5 , which rests against the 35 outer ends of said cog-teeth, and removes such dirt from them before, in the forward rotation of said wheel, they are brought into contact with said pinion.

40 We are aware that a rake-arm pivoted in a head and provided with a yoke forming bearings for a detachable pin, on which the rake swings, has heretofore been employed, and we therefore lay no claim to such construction.

45 In our invention the rake-arm and the pin (or that part of the arm on which the rake swings) are capable of being made in one piece, and do not require the employment of a yoke to support the pin. The yoke is therefore dispensed with, and the number of parts employed fewer, thus simplifying the construction, rendering it lighter and cheaper and 50 less liable to get out of order, as the pin on which the rake swings is not liable to become detached.

55 What we claim as our invention, and desire to secure by Letters Patent, is—

1. The tongue E and brace m , pivoted to the frame F in front of the driving-wheel, in combination with the lever D, connected rigidly to 60 such brace, curved laterally at its lower end, and extending outside of the driving-wheel and engaging with a bar supported from the end of the axle, and the diagonal brace L, pivoted to the inner side of the tongue and to the 65 end of the knife-guard, substantially as and for the purpose set forth.

2. The spring-seat arm $e f$, supported on the

axle inside of the driving-wheel and extending upwardly above and outside of said driving-wheel, and the slotted guide h , secured to the 70 seat-arm outside of the driving-wheel, in combination with the bar g , sleeved on the end of the axle and projecting into the slotted guide, and the lever D, working upon such guide below the seat-arm, substantially as described and shown. 75

3. In a harvester, the combination, with the journal-box t and the short crank-shaft movable laterally by means of the lugs x , slide z , and lugs y , of the lever h , pivoted loosely to 80 the frame F below the slide z , and engaging with a stop, d' , above such slide, and the shaft a' , projecting from the slide through said lever, and carrying the spring b' , constructed and arranged substantially as described and shown. 85

4. In a harvester, and in combination with the clutch P', constructed as described, the notch p' and the inclined face h' of the ring i' , in combination with the lug o' upon the part 90 g' of said clutch, substantially as and for the purpose set forth.

5. In a harvester, and in combination with the clutch P', constructed as described, the spring v' and washer m' , for compelling the parts $f' g'$ of said clutch to engage when the 95 rotation of the ring i' has broken the engagement of the notch p' in the inclined face of said ring with the lug o' , substantially as described.

6. In a harvester, the plate m^2 and hook n^2 , 100 the former being secured to the platform K and the hook adjustably secured to the plate, for the purposes specified.

7. The combination, with the platform K, of the angle-iron shoe b^4 , secured to the front 105 edge of such platform, and the knife-guards b^3 , bolted to such plate and platform, constructed and arranged substantially as described and shown.

8. The pivotal arms V, having the clutch w' 110 formed therewith, in combination with the thimble-plate w' , sleeved on said arm, and provided with the sliding clutch v' and wings secured to the rake-bars W W', and the spring x' , bearing on the upper end of the thimble-plate, 115 substantially as and for the purposes specified.

9. The combination, with the rake-head R, provided with pivotal arms V, each having a clutch, w' , formed therewith, of the thimble-plate w' , sleeved on said arm, and provided 120 with the sliding clutch v' , lug y' , and spring x' , arranged above the thimble-plate, trips c^2 , and rake W, substantially as and for the purposes specified. 125

In testimony that we claim the above as our invention we hereunto subscribe our names this 18th day of December, 1878.

OTTO KROMER.
FRANK RINKLEFF.

Witnesses:

JAMES SAUNDERSON,
W. W. WETHERILL.