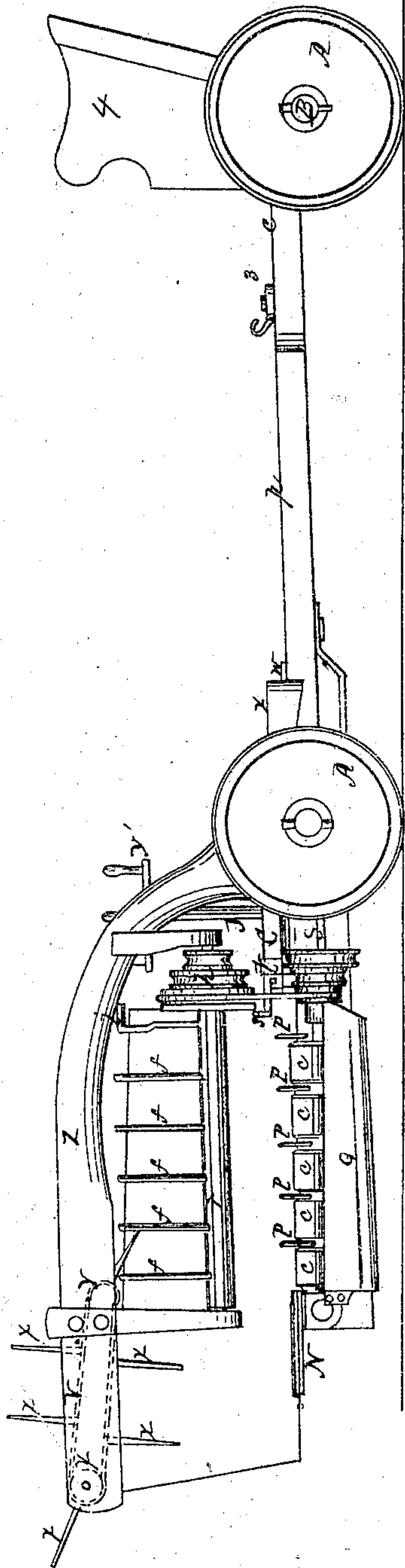
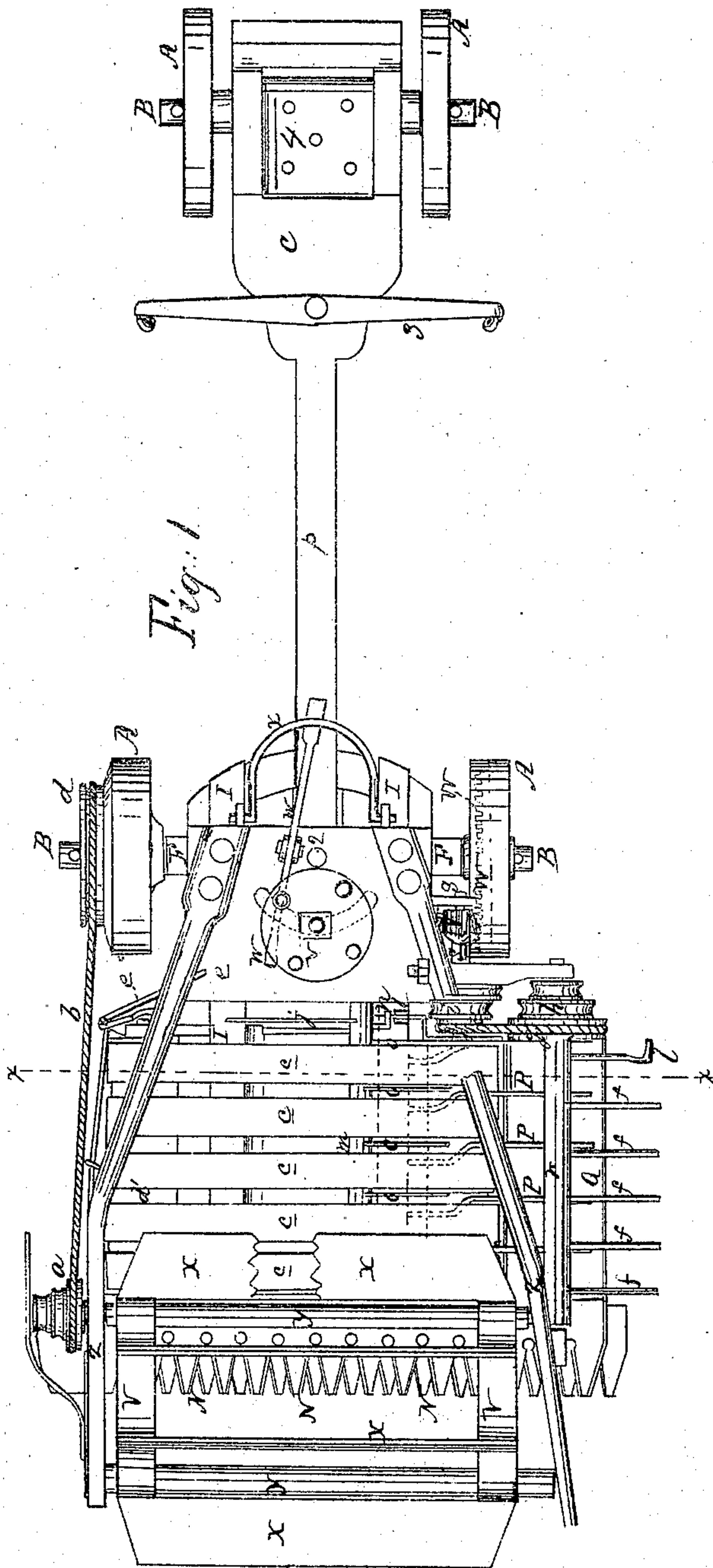


# H. Knowles & H. C. Bevington's Reaping Machine.

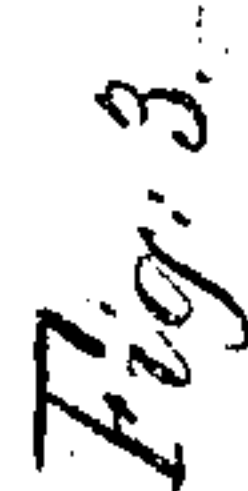
N<sup>o</sup> 7.475.

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# UNITED STATES PATENT OFFICE.

HAZARD KNOWLES, OF WASHINGTON, DISTRICT OF COLUMBIA, AND  
HENRY C. BEVINGTON, OF HOLMES COUNTY, OHIO.

IMPROVEMENT IN THE CUTTERS AND RAKERS OF A GRAIN AND GRASS HARVESTER.

Specification forming part of Letters Patent No. 7,475, dated July 2, 1850.

*To all whom it may concern:*

Be it known that we, HAZARD KNOWLES, of the city and county of Washington, and District of Columbia, and HENRY C. BEVINGTON, of the county of Holmes and State of Ohio, have invented a new and useful Improvement in the Machine for Reaping and Mowing, which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

Figure 1 is a top view or plan of the machine. Fig. 2 is an elevation of the right side of the same. Fig. 3 is a transverse section, looking toward the rear, taken through the dotted plane *xx* of Fig. 1. Fig. 4 is a sectional view, showing the segment and pinion for steering the machine, also a section of the vibrating finger-bar. Fig. 5 is a view showing the front edge of the knives, bed-timber, and attachment of the crank and pitman to give the reciprocating sliding movement to the lower plate of knives. Fig. 6 is a sectional top view of the upper and lower cutting-plates (drawn half-size) of an operating machine. Fig. 7 is the same view inverted, showing the under spring flange or portion of the upper plate of cutters turned under the lower plate and forming a bearing for the same. Fig. 8 is a transverse section of the same.

The same letters in the several figures of the drawings refer to like parts.

The supporting and conveying wheels A, axles B, frame C, rotating rake *f*, gearing U W for vibrating the cutters, attachment for drawing the machine forward, and several other parts and their arrangement, not differing essentially from the same in other reaping and mowing machines in use, need no particular description.

The improvements that we have made in the machine relate to the cutters N, arresting-fingers O, cyma-reversa gavel-holders P, grain catcher and shield Q, steering apparatus G and J, and arresting hook-teeth *o*, and several other parts of the machine which will be pointed out hereinafter.

The cutters N that cut the grain or hay are made like others in use for a similar purpose, except that the triangular teeth on the edges of the two steel plates are made concave on their faces that come together for the purpose

of rendering them self-sharpening on their cutting-edges as they wear. The upper steel plate is made stationary in the frame, and may be termed the "counter-plate." The lower plate is made to slide back and forth against the upper stationary plate by means of crank-shaft S and connecting pitman-rod T, attached to the under side of the lower cutter-plate N, motion being communicated to the crank-shaft in the usual manner by a bevel-pinion, U, on the crank-shaft working into a bevel-wheel, W, fixed to the inner face of the propelling-wheel. The upper cutter-plate is wider than the lower plate, and is bent round the back of the latter and under it and turned up at right angles, and notched so as to form a number of bearing-points against the under side of the lower or sliding cutter-plate, the bent or curved portion forming a concave bearing for the back of the lower plate, which is provided with a rib to stiffen it, and is rounded to correspond with said concave bearing, in which it slides back and forth during the operation of reaping. The upper plate is thus bent for the purpose likewise of forming a spring to bear the lower cutter-plate against the upper plate and keep the cutting-edges of the points always in close contact and under a constant pressure toward each other.

X is a revolving bearer for bearing the grain back against the cutters, and when cut carrying it back to the endless aprons or belts *c* as the machine is moved forward. This revolving bearer is composed of a number of bars, *x*, fixed to two endless straps, V, passed over two parallel rollers, Y, whose bearings are in two curved arms, Z, fastened to the frame, one of said rollers being extended through and beyond one of the said curved arms, and having on its outer end a pulley, *a*, around which is passed an endless band, *b*, leading to another pulley, *d*, on the outer face of the left driving-wheel A, by which motion is communicated to the grain-bearer X.

*c c c c c* are five endless revolving straps for conveying the grain, when cut, to the gavel-fingers at one side of the machine. These straps are passed around two parallel rollers, *d' d'*, one of which is on the crank-axle S and the other is on an axle, *e*, having its bearings in the forward or turning portion of the frame,



so that when the machine is moved forward these bands are moved simultaneously with the cutters. These bands are placed parallel and at such distance apart that certain holding-teeth and gavel-fingers may pass up between them, and that loose grain may fall into a metallic grain-catcher beneath the bands. This grain-catcher, which is marked Q in the drawings, is composed of a plate of metal, bent so as to form a shield as well as a receiver for the grain, and is secured to the forward part of the frame beneath the endless bands, so that it shall serve as a shield to protect them from hard substances that would have a tendency to injure the straps and obstruct the due operation of other parts of the machine, and at the same time catch whatever grain may be shaken from the heads. It is divided by a partition, *q*, so as to form a receiver directly under the cyma-reversa fingers upon which the cut grain is formed into gavels, which receive the greater portion of loose grain falling from the heads during the operation of collecting the straw into sheaves or gavels.

The gavel-fingers P, for collecting the grain into gavels or sheaves before being thrown off by the side of the machine, are composed of rods of iron, P, inserted into one of the parallel longitudinal timbers, I, of the frame, at right angles thereto, each rod being bent into the form of a cyma-reversa for the purpose of holding the grain until a sufficient quantity is collected thereon to form a gavel or sheaf, when it is removed therefrom by the revolving rake *f*. The rods or fingers P are placed in the chambers or grooves in the roller *d'*, between the bands, parallel to each other, as shown in Fig. 1.

The revolving rake *f*, for throwing the gavels from the cyma-reversa fingers P, is composed of a roller, *r*, into which are inserted a number of teeth, which, as the roller revolves, strike the bundle of grain or gavel and throw it from the fingers and deposit it upon the ground in proper order to be tied. Motion is imparted to this roller by means of an endless band, *g*, crossed and passed around a pulley, *h*, on its axle, leading to another pulley, *i*, on the crank-axle S. As soon as a sufficient quantity of grain is collected on the cyma-reversa fingers P to form a sheaf or gavel the grain on the endless bands *c* is prevented from passing from the bands by a number of vibrating hooks or claws, *o*, projecting from a rock-shaft, *m*, and passing upward between the endless bands *c* and holding the grain back until the revolving rake *f* has discharged the gavel or sheaf from the fingers P. The bearings of the gudgeons or axle of this roller is in the frame. As soon as the curved fingers P have received a sufficient quantity of grain to form a sheaf a bent arm, *l*, inserted into the roller *r* of the rake, strikes upon the long arm of a lever, *s*, whose fulcrum is at *t*, and bears said arm down, and at the same time raises the short arm of the lever, which is in contact with a right-angled arm, *n*, inserted into

the roller *m*, causing it to turn and raise the hooks or claws *o* above the level of the apron and catch the straw and hold it till the grain on the fingers P is removed. The roller *r* continuing to revolve, the bent arm *l* passes by the lever *s*, when the spring *j*, projecting from the roller *m* and resting upon the timber I, brings back the several parts to their former positions, and the hooks or claws falling below the level of the aprons upon which the grain lies, and thus allows the grain to pass on to the curved fingers P until another gavel or sheaf is collected, when the bent arm again comes round and acts upon the lever, causing the hooks or claws to arrest the grain, as before.

The fore part of the frame, which is attached to the forward axle-tree, and which contains all the operative parts of the machine, is made to turn in any direction by means of a steering apparatus. The steering apparatus by which the cutters are turned to the right or to the left consists of a segment of a cog-wheel, G, fastened to the forward axle-tree, F, into which a pinion, H, gears, said pinion being turned by a vertical axle, J, whose bearing or box is in the forward part of the perch *p*, which projects beyond the forward axle-tree, a plate, *y'*, containing a number of handles for the steersman to lay hold of to turn the pinion-axle being affixed to the head of the axle J. The connecting-bolt 2 of the fore axle-tree, with the perch *p*, forms the center on which the fore axle-tree, with the frame, turns when the pinion is turned. The frame is prevented from turning by a semi-circular latch-plate, *x*, pivoted to the timbers I, said plate being notched in the lower edge so as to fall over the perch and hold the forward axle-tree from turning on its center. When it is required to turn the frame this latch-plate must be raised from the perch by a lever, *w*, or other means.

The horses to draw the machine are geared to the whiffletree No. 3, with their heads toward the front part of the machine. The driver's seat is at No. 4.

Having thus described the nature of our invention and improvement, what we claim as new, and desire to have secured to us by Letters Patent, is—

1. Making the pointed cutters N concave on the faces toward each other in the manner and for the purpose set forth, by which the cutters are rendered self-sharpening, and bending the upper plate over the back of the lower or sliding cutter-plate and bringing the notched or turned edge against the lower plate, in the manner and for the purpose described.

2. The arrangement of the stationary cyma-reversa fingers P in combination with the vibrating hook-teeth or claws *o*, bands *c*, and the appendages for operating the same, by which the grain is collected into sheaves or gavels before being discharged upon the ground.

3. The combination of the hook-teeth or claws *o*, rock-shaft *m*, bent arm *n*, lever *s*,

spring *j*, and revolving arm *l* for arresting the grain while removing the gavel or sheaf from the cyma-reversa fingers *P* onto the ground, as described.

4. The combination of the pinion *H*, perch *p*, and axle *F*, the former working into the segment on the front axle-tree for steering the forward part of the frame and cutters.

In testimony whereof we have hereunto signed our names before two subscribing witnesses.

HAZARD KNOWLES.

HENRY C. BEVINGTON.

Witnesses:

WM. P. ELLIOT,

A. E. H. JOHNSON.