3 Sheets—Sheet 1.

E. M. KRUM.

Harvester.

No. 54,372. Patented May 1, 1866.

Fig. 1

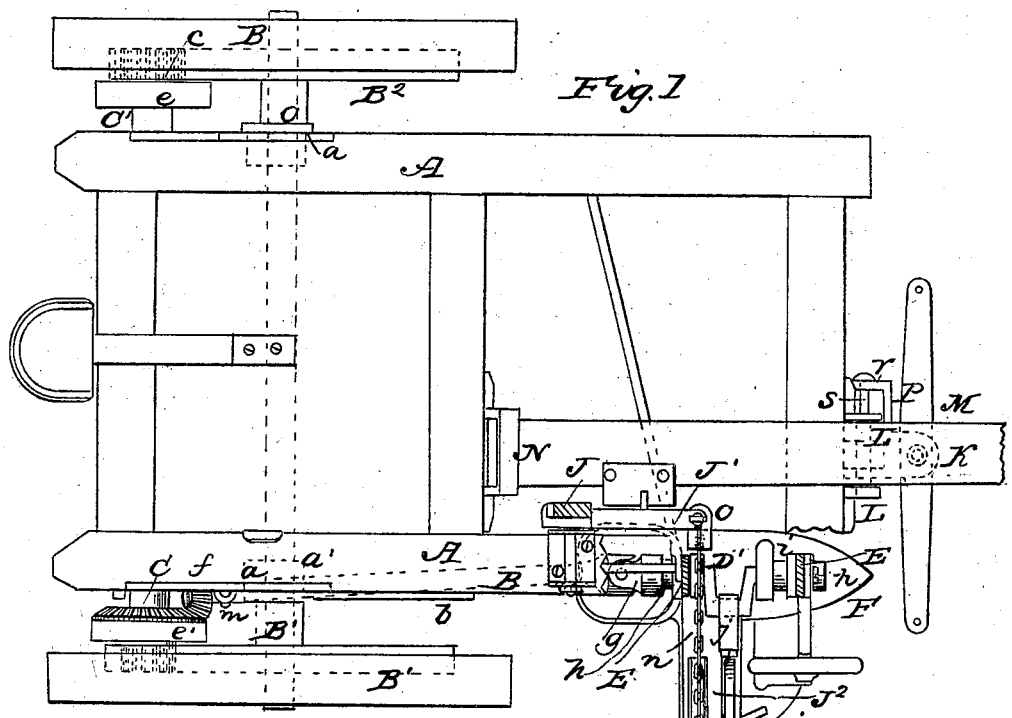
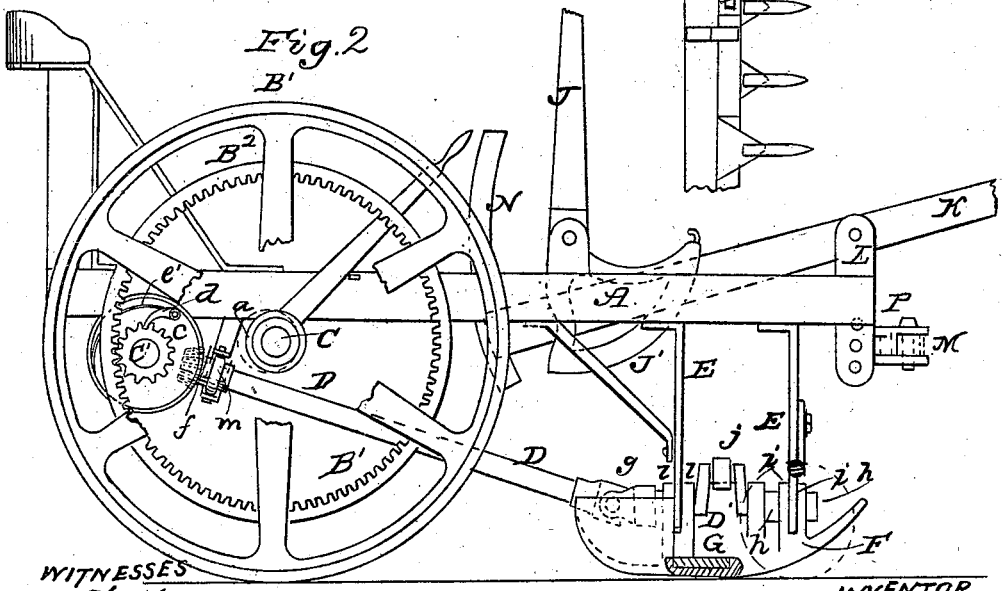


Fig. 2



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3 Sheets—Sheet 2.

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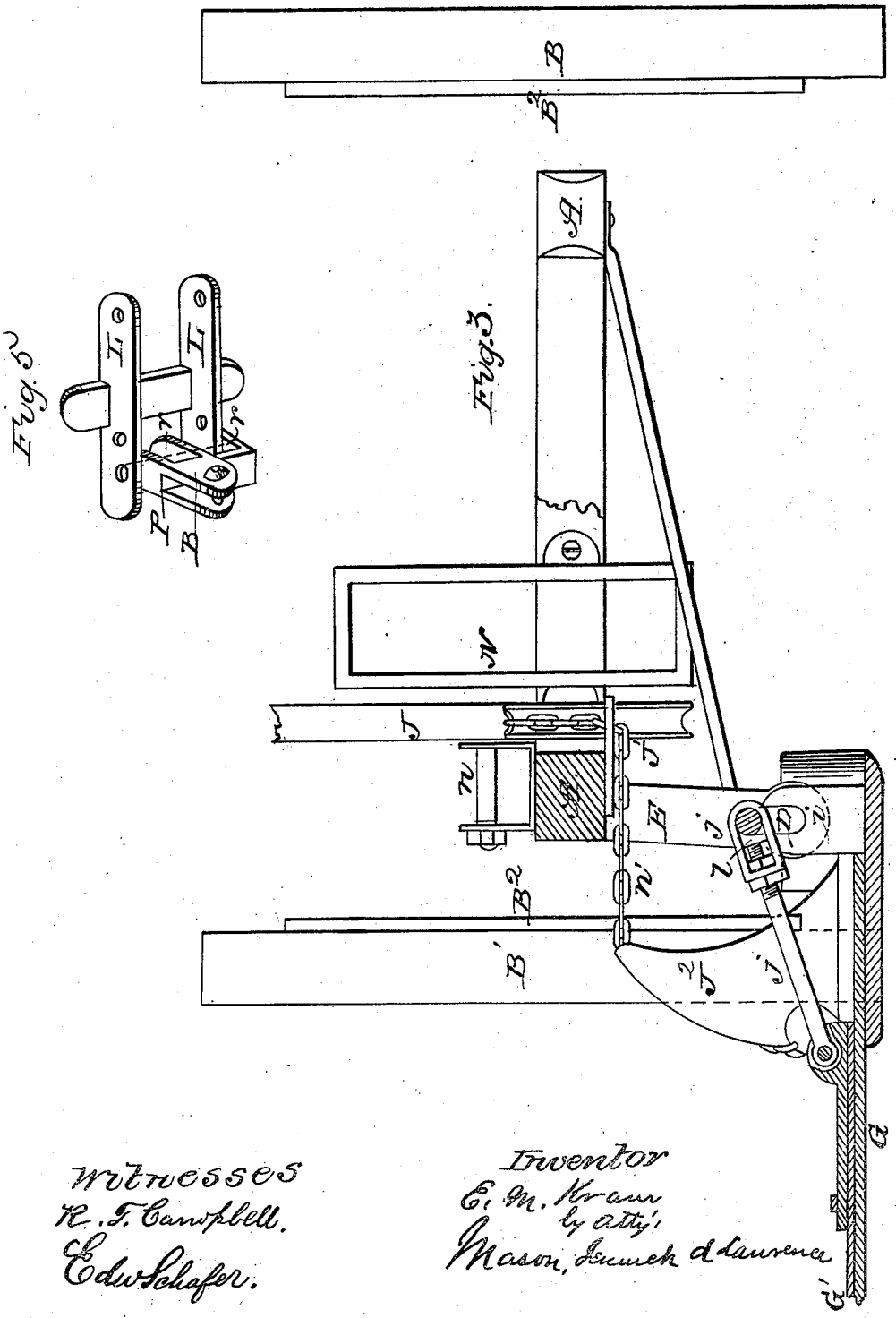
Harvester.

No. 54,372. Patented May 1, 1866.



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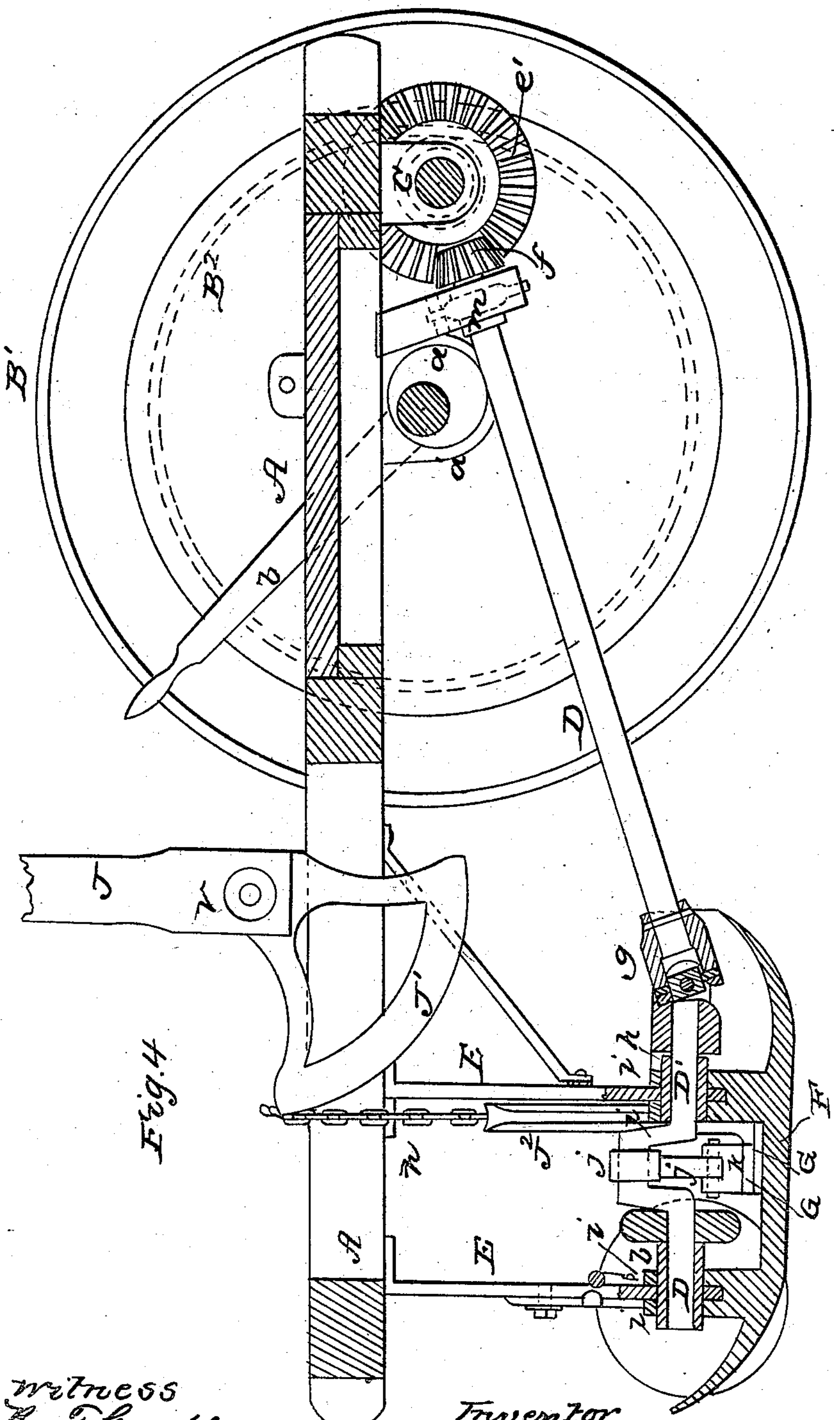

Fig. 4

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UNITED STATES PATENT OFFICE.

E. M. KRUM, OF NASSAU, NEW YORK,

IMPROVEMENT IN HARVESTERS.

Specification forming part of Letters Patent No. **54,372**, dated May 1, 1866.

To all whom it may concern:

Be it known that I, E. M. KRUM, of Nassau, in the county of Rensselaer and State of New York, have invented a new and Improved Harvester; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had the accompanying drawings, making a part of this specification, in which—

Figure 1 is a plan view of the improved machine, a portion of the frame of which is broken away over the joint of the finger-bar. Fig. 2 is an elevation of one side of the machine. Fig. 3, Sheet 2, is a vertical transverse section through the joint of the finger-beam. Fig. 4 is a longitudinal section, showing the mode of jointing or hinging the finger-beam to the frame of the machine. Fig. 5 is a perspective view of the clevis for the draft-pole and double-tree.

Similar letters of reference indicate corresponding parts in the several figures.

One of the objects of my invention is to hinge the finger-beam, or some part to which this beam may be rigidly connected, to the draft-frame, so that its axis of motion shall coincide with the axis of the crank-shaft, to which the pitman is attached, thereby admitting of the rising and falling of the outer end of the finger-bar, or the adjusting of this bar to a vertical position, without causing any binding or straining of the sickle or the parts which give motion thereto, as will be hereinafter described.

Another object of my invention is to so arrange the shaft of the pitman-crank which gives motion to the sickle that this crank shall not have a tendency to lift the inner end of the sickle in drawing it toward the draft-frame, nor to unduly press it downward in thrusting it outward, as will be hereinafter described.

Another object of my invention is to communicate motion to a horizontal crank-shaft which is arranged over the inner shoe and beneath the draft-frame by means of an inclined shaft which receives its motion from the driving-wheels, as will be hereinafter described.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings, A represents the draft-frame, which is mounted upon transporting-wheels B B′, which turn loosely upon their transverse axle C. This axle C has two eccentric hubs, *a a*, formed on it, which are fitted in bearings *a′*, that project below the side beams of the frame A.

A lever, *b*, is used for oscillating the axle C and moving the wheels B B′ backward and forward a distance which is equal to the eccentricity of the hubs *a a*.

In rear of the axle C is a transverse shaft, C′, having pinion spur-wheels *c c* applied loosely on its ends, which pinions engage with the teeth on inside spur-wheels, B^2 B^2, on the wheels B B′ when the lever *b* is thrown forward, as shown in Figs. 1 and 2. The pinions *c c* turn the shaft C′ when the machine is moved forward; but when the machine is moved backward the pinions turn loosely upon their shaft. These pinions *c c* are engaged with their shaft C′ by means of pawls *d d*, which are applied to drums *e e′*, that are keyed on the shaft C′. The drum *e′* has bevel-teeth formed on it, which engage with a pinion-wheel, *f*, that is keyed on the upper end of a longitudinally-inclined shaft, D, which inclines downward and forward, and is connected by a universal coupling, *g*, to a horizontal crank-shaft, D′, as shown in Figs. 2 and 4. When the lever *b* is moved backward the spur-wheels B^2 are disengaged from the pinions *c c*, and the machine can be drawn along without moving the sickle.

E E are two pendent supports, which are secured rigidly to the draft-frame A near its forward end, and which are braced by diagonal rods, as shown in the drawings, so as to afford a firm support for the cutting apparatus. To the lower ends of these supports the inner shoe, F, is pivoted by means of tubes *h h*, through which passes the horizontal shaft D′. The shoe F is constructed with two pairs of lugs, *i i*, between which the lower ends of the supports are fitted. These lugs are perforated to receive through them the longitudinal tubular pivots *h h*, so that there will not be any strain or undue friction upon the crank-shaft, which has its bearings in said tubes. The inner shoe, F, is also constructed with a shield on its rear end, which partially incloses the universal coupling *g* and prevents grass or other substance from getting into the joints of the coupling and causing it to work stiff. This shoe is also so constructed as to receive upon it the inner end of the finger-beam G, which beam is bolted rigidly to the shoe, so

that its axis of motion will be at the same point as that of the shoe—viz., the center of the tubular pivots or axis of the crank-shaft D′.

To the crank of the shaft D a pitman-rod, *j*, is attached, the opposite end of which rod is pivoted to a lug, *k*, on the sickle-bar G′. This pitman-rod *j* has a male screw cut on that end which is nearest the crank, which screw enters a box, *j′*, and presses a sliding block, *l*, up against the crank-wrist, as shown in Fig. 3. As the block *l* is worn away and the box *j′* becomes loose this block can be set up by turning the pitman-rod; it being previously detached from the sickle-bar; or it may be adjusted by simply turning the nut on said rod.

The crank-shaft D′ is depressed until the axis of the crank-wrist, in making its revolutions, will fall below the plane of the sickle-bar, for the purpose of preventing this bar from being thrust up during one stroke and unduly pressed down upon the finger-beam during the other stroke.

By the arrangement of the crank-shaft, as above mentioned, the cutters will be drawn or pressed down to the cutting-edges of the guards during both strokes of the sickle-bar.

As there will be more or less lateral movement of the lower end of the inclined shaft D, caused by the pressure of the grain or grass upon the outer end of the cutting apparatus, I have supported the upper end of the shaft D in a jointed bearing-box, *m*, (shown in Fig. 2,) which will allow this shaft to accommodate itself to the lateral movements above stated.

By constructing the joint of the finger-beam as above described this beam can vibrate freely about the shaft D′, and it can be thrown up to a vertical position against the side of the draft-frame without altering the relation of the knives on the sickle-bar with their guard-fingers. Hence the points of these knives will be brought to the centers of the guard-fingers by the rotation of the crank in whatever position the finger-beam may arrange itself.

The cutting apparatus can be adjusted to a vertical position against the draft-frame by means of a lever, J, which is pivoted to the draft-frame A at *n*. This lever has a grooved segment, J′, on its short arm, over which is a chain, *n′*, that passes downward under a roller or through an eye-piece, *o*, and thence outward over a grooved segment, J², which is bolted on the finger-beam G in rear of the pitman-rod *j*. The chain is attached to the segment J² near its base. This segment is concentric to the axis of the crank-shaft D′, and it affords a good leverage for facilitating the raising of the cutting apparatus when the upper end of lever J is drawn backward by the attendant mounted upon the draft-frame.

The draft-pole K is pivoted between two vertical portions, L L, of a cast-metal clevis, which is bolted to the forward transverse bar of the draft-frame, as shown in Figs. 1 and 2. The rear end of the draft-pole is guided in its vertical vibration between a segment-guide, N, which prevents lateral play of the end of said pole. Below the point of connection of the draft-pole the double-tree M is pivoted to a casting, P, which has three eyes or lugs, *r*, projecting from it that are received between the portions L L, and which receive through them a coupling-pin, S. This arrangement of a clevis admits of a vertical adjustment or a lateral adjustment of the point of draft.

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

1. Hinging the finger-beam of the cutting apparatus to the draft-frame by means of eye-bearings formed directly on the inner shoe, F, the crank-shaft which drives the sickle, and pendent brackets E E, which afford tubular bearings for the crank-shaft and tubular pivots for the finger-beam, both at front and rear of the cutting apparatus, substantially as described, and for the purpose set forth.

2. The combination of the inner hinged shoe, crank-shaft, and inclined jointed shaft D, the said parts being constructed and arranged and operating substantially as described.

3. Supporting the upper end of the inclined shaft D in a jointed bearing-box, *m*, when this shaft is connected to the horizontal crank-shaft D′ by a universal coupling, *g*, substantially as described.

4. The construction and arrangement of the tubular pivots *h h*, pendants E E, shoe F, for the purpose of supporting a horizontal crank-shaft, substantially as described, and for the purpose set forth.

5. The arrangement of the pitman-box *j′* so as to be tightened by the end of the pitman-rod *j* setting against a half bearing-box, *l*, substantially as and for the purpose shown and described.

6. The segment J² on the finger-beam G, in combination with the segment J′ on the hand-lever J, and chain for enabling the attendant to adjust the finger-beam to a vertical position, substantially as described.

E. M. KRUM.

Witnesses:
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J. B. CUTIVER.