(No Model.)

5 Sheets—Sheet 1.

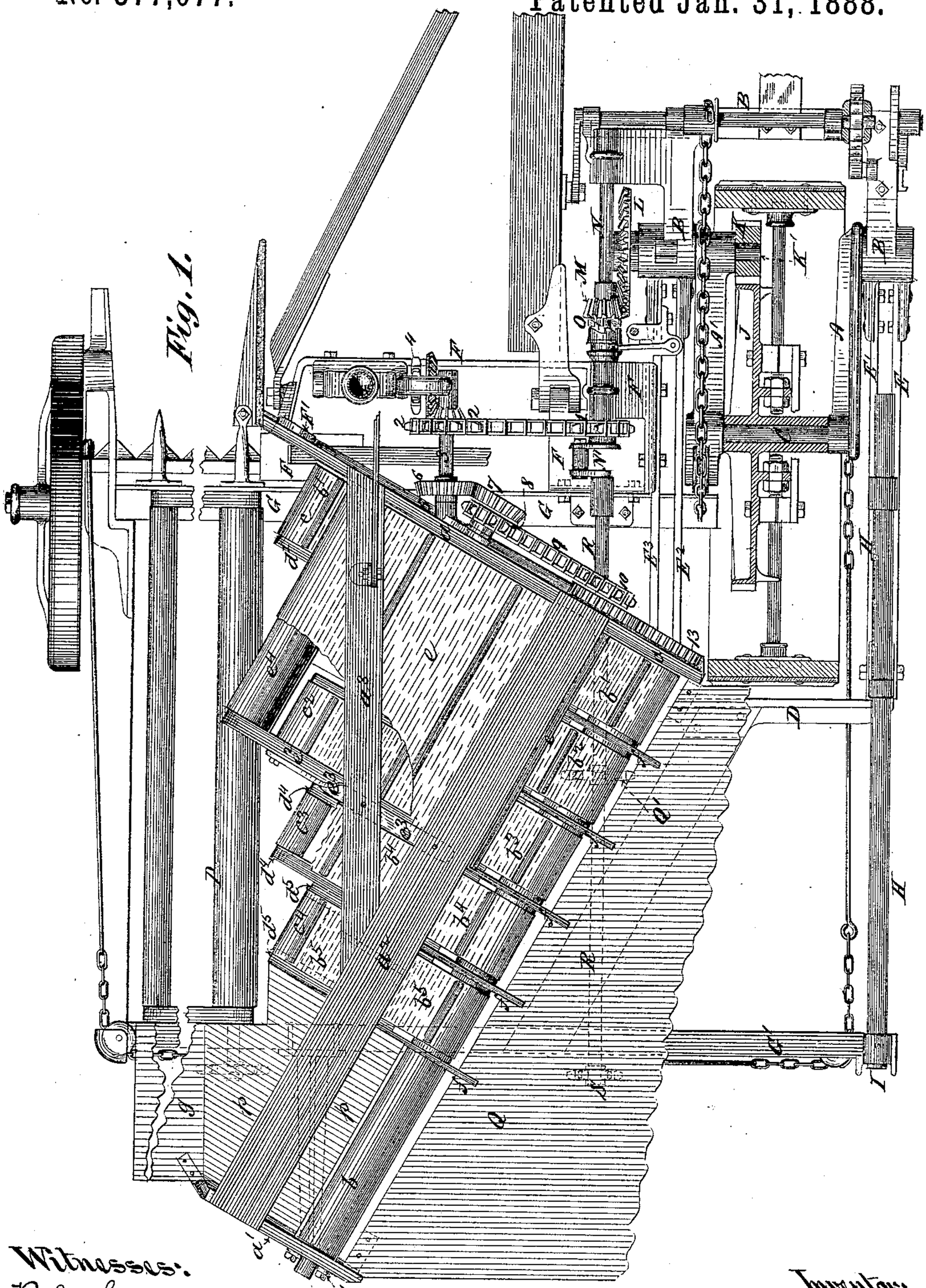
S. V. KENNEDY.

HARVESTER.

No. 377,077.

Patented Jan. 31, 1888.

Fig. 1.



Witnesses:
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M. L. Adams.

Inventor:
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(No Model.)

5 Sheets—Sheet 2.

S. V. KENNEDY.

HARVESTER.

No. 377,077. Patented Jan. 31, 1888.

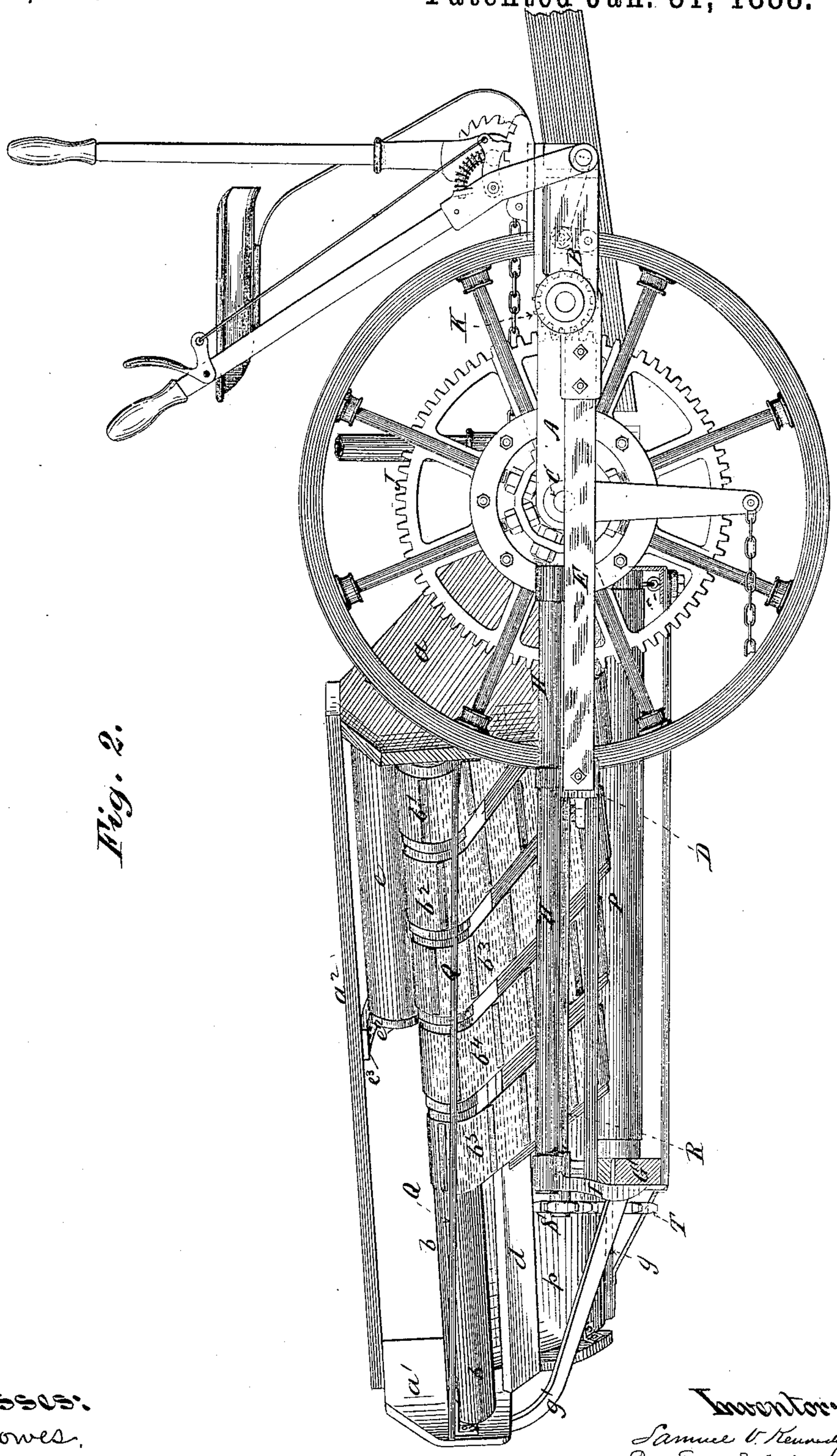

Fig. 2.

Witnesses:
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(No Model.)

5 Sheets—Sheet 3.

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HARVESTER.

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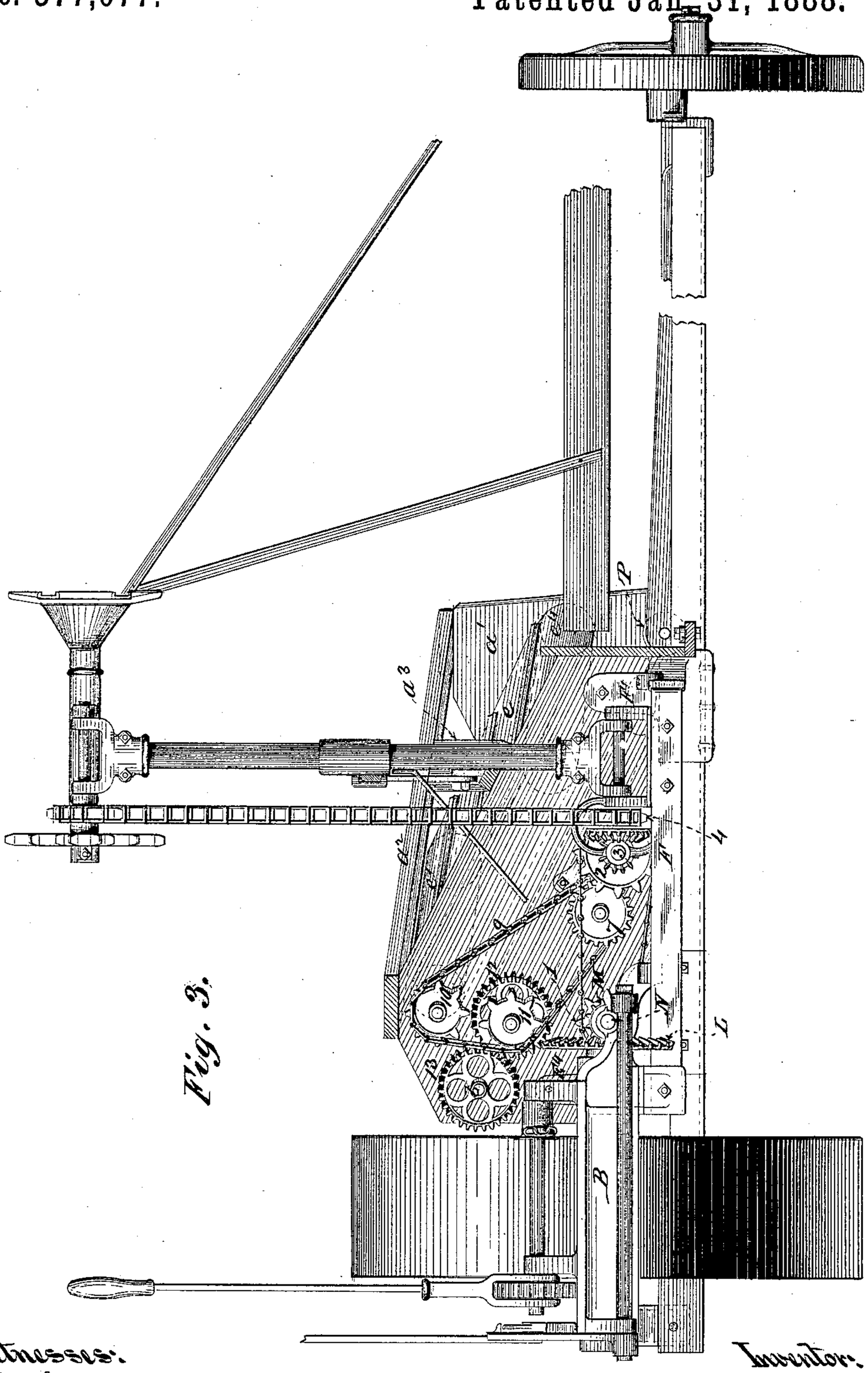

Fig. 3.

Witnesses:
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HARVESTER.

No. 377,077. Patented Jan. 31, 1888.

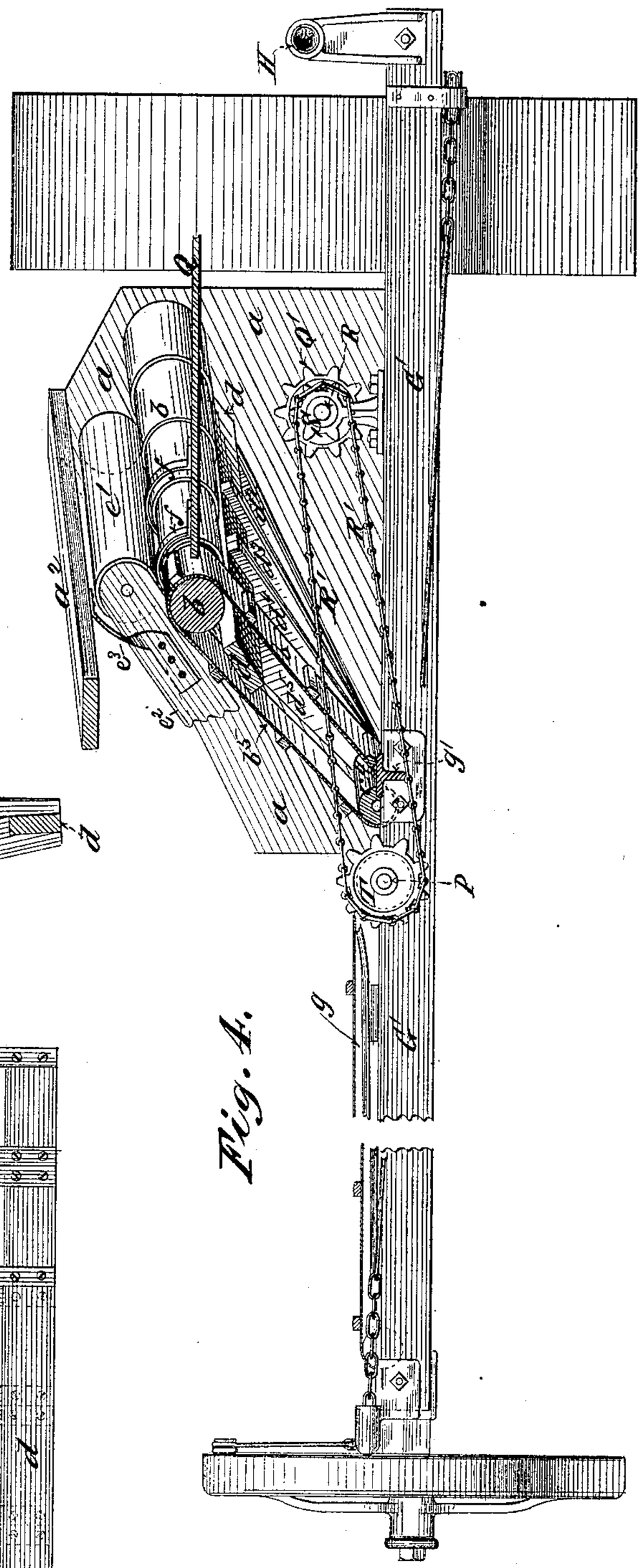

Fig. 4.

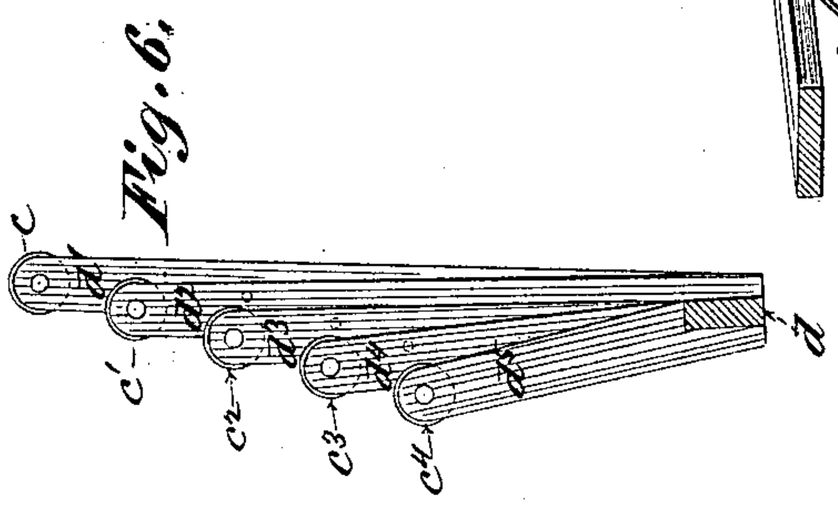

Fig. 6.

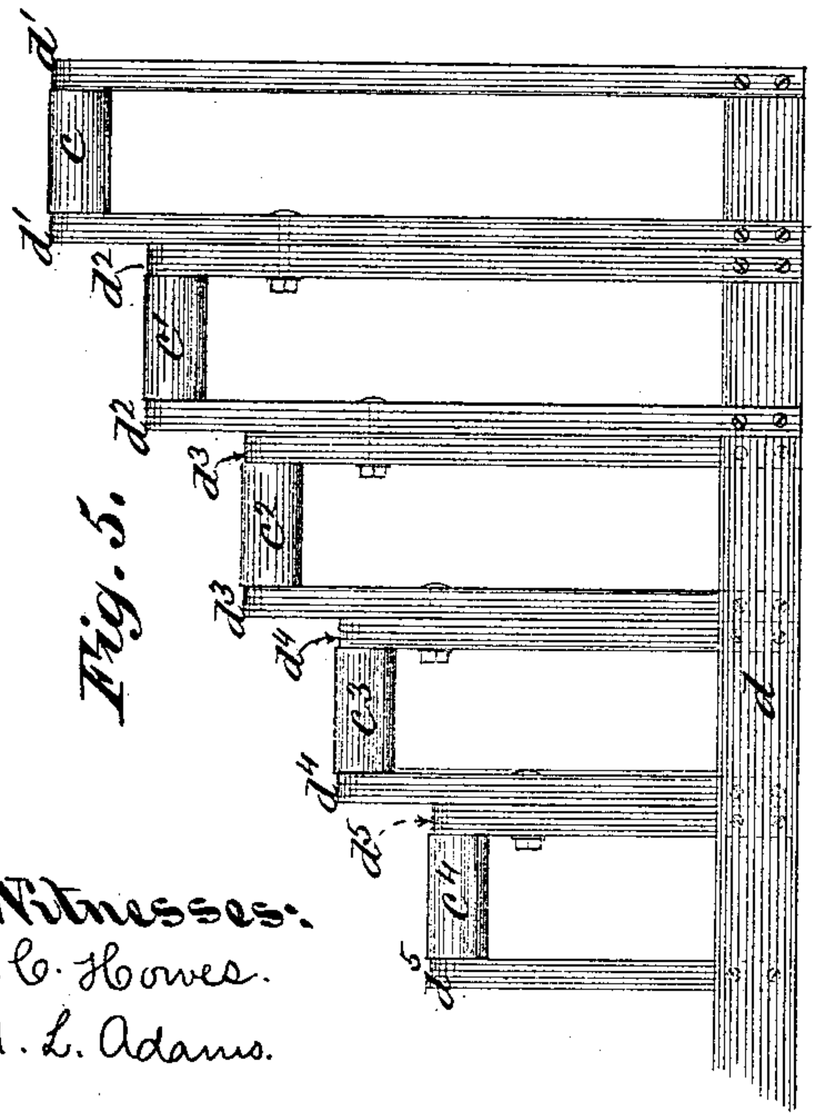

Fig. 5.

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(No Model.)

5 Sheets—Sheet 5.

S. V. KENNEDY.

HARVESTER.

No. 377,077. Patented Jan. 31, 1888.

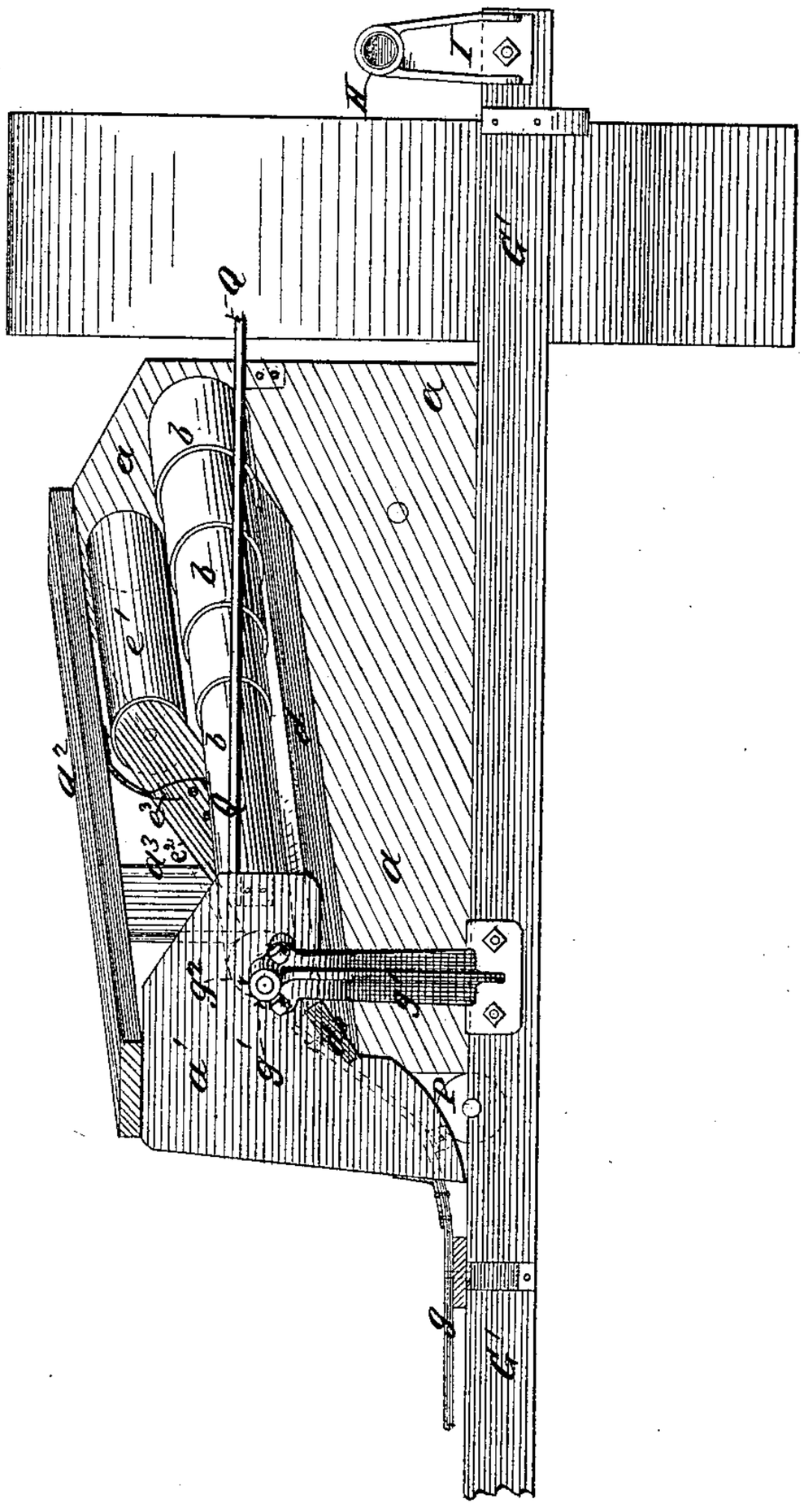

Fig. 7.

Witnesses:
R. C. Howes.
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Inventor:
Samuel V. Kennedy,
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UNITED STATES PATENT OFFICE.

SAMUEL V. KENNEDY, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO THE MINNEAPOLIS HARVESTER WORKS, OF SAME PLACE.

HARVESTER.

SPECIFICATION forming part of Letters Patent No. 377,077, dated January 31, 1888.

Application filed December 16, 1885. Serial No. 185,789. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL V. KENNEDY, of Minneapolis, Minnesota, have invented certain Improvements in Harvesters, of which the following is a specification.

My improvements relate to the type of harvesters in which the cut grain, instead of being elevated from the platform and carried over the drive-wheel, is moved in a diagonally-rearward path to a binder-deck, which is behind the drive-wheel; and the distinguishing characteristic of my invention is the device which I employ for receiving the flow of grain from the platform-carrier and imparting to it a diagonally-rearward change of direction. This device consists of a number of endless carriers driven at respectively different velocities from a diagonal driving-roller which adjoins the edge of the binder-deck, the diagonal carriers being stretched, respectively, over a number of diagonal idler-rollers, which are arranged in proximity to the stubble side of the platform-carrier. The most rapidly-moving diagonal carrier is nearest to the front of the machine, and is that which acts upon the butts of the grain. Each of the other diagonal carriers moves at a slightly less rate than the diagonal carrier immediately in front of it. In connection with the diagonal carriers I employ an overrunning canvas, also mounted on diagonal rollers.

My invention also embraces the combination, in a harvester, of a binder outside and in the rear of the drive-wheel and a system of diagonal carrier-belts for conducting the grain from the platform to the said binder, with a grain-wheel and drive-wheel, the axes of which are nearly in alignment with the vertical plane of the sickle, and a main frame inclosing the drive-wheel, whereby the greater portion of the weight of the entire machine is concentrated upon the drive-wheel.

The accompanying drawings, illustrating my improvements applied to a harvester, are as follows: Figure 1 is a top view. Fig. 2 is an elevation of the stubble side of the machine. Fig. 3 is a front elevation. Fig. 4 is a rear elevation, partly in section. Fig. 5 is a top view, and Fig. 6 a side view, illustrating the construction of the frame which supports the diagonal idler-rollers. Fig. 7 is a rear view of the diagonal belt-carrier frame and a portion of the harvester.

The harvester-platform derives its support from the drive-wheel by means of the two links A and A′, which are pivoted at their forward ends in the rearwardly-projecting arms of the casting B, which constitutes the front portion of the main frame. The rear ends of the links A and A′ are keyed and pinned rigidly to the drive-wheel axle C. The main frame which surrounds the drive-wheel is composed of the front casting, B, and the rear casting, D, the parallel bars E E′ on the stubble side of the drive-wheel, and the similar parallel bars E^2 E^3 on the grain side of the drive-wheel, the opposite ends of which are bolted to the castings B and D, respectively, as shown in the drawings. The platform is connected in front to the main frame by means of the casting F, bolted to the parallel bar E^3 and to the cutter-bar G.

A horizontal tubular girder, H, the forward portion of which is supported upon and secured to the parallel bars E and E′, is affixed at its rear end to the top of the standard I, the lower end of which is connected to the rear sill, G′, of the platform.

The train of gearing by which power is transmitted to the several parts of the machine consists of the usual drive-wheel gear, J, the pinion K, affixed to the stubble end of the counter-shaft K′, the bevel-wheel L, affixed to the opposite end of the counter-shaft, and the bevel-pinion M, mounted loosely upon the crank-shaft N, by means of which power is communicated to the clutch O, sliding upon a key in the crank-shaft N. The crank-shaft N is supported by bearings bolted to the forward casting, B, of the main frame and to the casting F.

Power is conveyed to the platform canvas roller P by means of the shaft R, which is a rearward extension of the crank-shaft N, and is connected thereto by the crank N′, and is provided at its rear end with a sprocket-wheel, S, carrying a sprocket-chain, R′, which drives the sprocket-wheel T upon the rear end of the platform-roller P. The cut grain is delivered to a binder-deck, Q, immediately in the rear of the drive-wheel.

The binding mechanism is not shown in the

drawings; but power to drive it is taken from the sprocket-wheel Q′, affixed to the shaft R. The delivery of the grain to the binder-deck is effected by a system of diagonal belts. The diagonal belt-frame is composed of the two standards *a a′*. The standard *a* at its grain end projects beyond the cutter-bar and extends in a diagonally-rearward direction therefrom, so that its stubble end just clears the periphery of the drive-wheel. It is supported in position by being bolted to the cheek F′ of the casting F near its forward end and to the angle-plate E⁴ near its stubble end. The angle-plate E⁴ is bolted to the horizontal bar E³ of the main frame. The standard *a* is inclined slightly in a diagonally-rearward direction, so that its side may be at a right angle with the axes of the diagonal belt-rollers. The rear standard, *a′*, which is similarly inclined, is supported at its grain end upon the horizontal shield *g*, extending backward from the top of the rear sill, G′. The rear standard, *a′*, is further supported by being bolted to cheeks cast upon the supporting-arm *g′*, which at its lower end is bolted to the rear sill and extends backwardly and upwardly therefrom, and is provided at its upper end with the box g^2, which affords the rear bearing for the diagonal belt-driving roller *b*. A transverse brace or cover board, a^2, is affixed at its opposite ends to the tops of the standards *a a′*, respectively, and the diagonal belt-frame is further strengthened by the brace a^3, which at its forward end is bolted to the top of the standard *a* and at its rear end is bolted to the under side of the cover-board a^2.

The diagonal belt-driving shaft *b* is turned to different diameters, like a cone-pulley. Its largest section is at the front end, and drives the most rapidly-moving diagonal belt *b′*. The next adjoining section is slightly smaller in diameter, and drives the adjoining diagonal belt b^2. The diagonal belt b^3 is driven by a still smaller section of the driving-shaft, the diagonal belt b^4 by one smaller yet, and the diagonal belt b^5 by the section of the driving-roller having the smallest diameter. The belt-shaft *b* is arranged at an inclination vertically with respect to the horizontal plane of the platform-carrier, and also horizontally inclined toward and from the said carrier, so that the variation in the size of the driving bearings or pulleys will bring the diagonal belts into a general plane flush with the surface of the platform-carrier.

The diagonal carrier-belts are stretched from their appropriate sections upon the driving-shaft *b* to the idler-rollers *c c′* c^2 c^3 c^4. The frame for supporting the idler-rollers is illustrated in detail in Figs. 5 and 6. The idler-rollers have their bearings in the lower ends of the arms *d′ d′* d^2 d^2 d^3 d^3 d^4 d^4 d^5 d^5, the upper ends of which arms are bolted to the transverse beam *d*, secured at its opposite ends, respectively, to the standards *a a′* and parallel with the driving-shaft *b*. The plane passing through the rear ends of the idler-rollers coincides with the plane of the platform-carrier. The plane of their front ends is of course higher because of the diagonal positions of the inclined belts relatively to the platform-roller P.

The diagonal belts are provided with transverse slats and the idler-rollers over which they roll are placed as near the platform-roller P as they can be and allow the clearance from each other of the rear ends of the slats, respectively, upon the platform-canvas and the diagonal belts. An inclined shield, *p*, extends from the rear edge of the rearmost diagonal belt b^5 to the rear standard, *a′*, and from the rear portion of the diagonal belt-driving roller *b* to the horizontal shield *g*.

To insure the efficient action of the diagonal carrier-belts upon the butts of the grain, there is provided the overrunning canvas *e*, which is driven by a roller, *e′*, having its front bearing in the standard *a* and its rear bearing in the inclined bar e^2, affixed to and supported in position by the bracket e^3, extending downward from the cover-board a^2. The overrunning canvas *e* is stretched around the driving-roller *e′* and the idler-roller e^4, which has its front bearing in the standard *a* and its rear bearing in the lower end of the inclined bar e^2.

The front edge of the overrunning canvas *e* is flush with the inner side of the standard *a*, and its rear edge overlaps the rollers upon which it is placed, and thus prevents the grain from being caught between the rear ends of those rollers and their bearings. Similarly, the diagonal belts are of greater widths than the lengths of the idler-rollers upon which they are stretched, so that they overlap the tops of the upper edges of the arms in which the idler-rollers have their bearings, and prevent the grain from being caught between the ends of the idler-rollers and the faces of the arms in which they have their bearings, respectively.

Power to drive the system of diagonal carrier-belts and the reel is taken from a sprocket-wheel, 1, affixed to the shaft N, the sprocket-chain from which drives the sprocket-wheel 2, affixed to the short intermediate shaft, 3.

By means of suitable bevel-gearing power is transmitted from the shaft 3 to a horizontal shaft carrying the sprocket-wheel 4, which drives the sprocket-chain, by means of which power is transmitted for the rotation of the reel-shaft. The shaft 3 has its front bearing in a box supported by the casting F and its rear bearing in a boss cast upon the gear-frame 5, which is bolted at the bottom to the front sill, G, and at its rear side to the standard *a*. The bevel spur-wheel 6 is affixed to the shaft 3, and drives the pinion 7, affixed to a stud-shaft having its bearing in another boss cast upon the gear-frame 5. The sprocket-wheel 8, moving with the pinion 7, carries the sprocket-chain 9, which drives the sprocket-wheel 10, affixed to the front end of the shaft of the overrunning-canvas driving-roller, and also drives the sprocket-wheel 11 and spur-

wheel 12, affixed to a stud-shaft provided with a bearing in the standard *a*. The spur-wheel 12 drives the pinion 13, affixed to the front end of the diagonal belt-driving shaft *b*. By means of this train of gearing the diagonal carrier-belts and the overrunning canvas are driven, respectively, in appropriate directions.

In operation the grain is taken from the platform by the diagonal belts. The butts are hurried forward, so that the stalks are brought into a position approximating parallelism with the axis of the diagonal belt-driving roller *b* at the time of their delivery to the binder-deck Q. The grain is prevented from being carried down between the diagonal belt-driving roller *b* and the edge of the binder-deck by the strippers *f f f*, &c., which are fastened to the transverse beam *d*, and extend upwardly and outwardly therefrom through the spaces between the diagonal belts and overlap the edge of the binder-deck Q.

I claim as my invention—

1. In a harvester, the combination of the side-delivery platform-carrier, the binder located behind the drive-wheel farther to the rear of the machine than the carrier, and a system of vertically-inclined diagonally-arranged belts for delivering the grain received from the carrier to the binder, consisting of an upper inclined and oblique shaft having rollers decreasing in diameter toward the rear, idler-rollers journaled in suitable bearings, and a series of belts traveling over the rollers on the shaft at the top and the idlers at the bottom of the incline, each belt having a width exceeding that of its idler, substantially as described.

2. In a harvester, the combination of the side-delivery platform-carrier, the binder located behind the drive-wheel farther to the rear of the machine than the carrier, and a system of vertically-inclined diagonally-arranged belts for delivering the grain received from the carrier to the binder, consisting of an upper inclined and oblique shaft having rollers decreasing in diameter toward the rear, a beam running parallel with said shaft, a series of inclined arms carried by said beam, decreasing in length and increasing in vertical inclination toward the rear, idler-rollers journaled in the lower ends of said arms, and a series of belts traveling over the rollers on the shaft at the top and the idlers at the bottom of the incline, each belt having a width exceeding that of its idler, substantially as described.

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