(No Model.) 2 Sheets—Sheet 1.

C. STEPHENS & C. A. CARTER.

STRAW ROPE MACHINE.

No. 369,479. Patented Sept. 6, 1887.

Fig. 1.

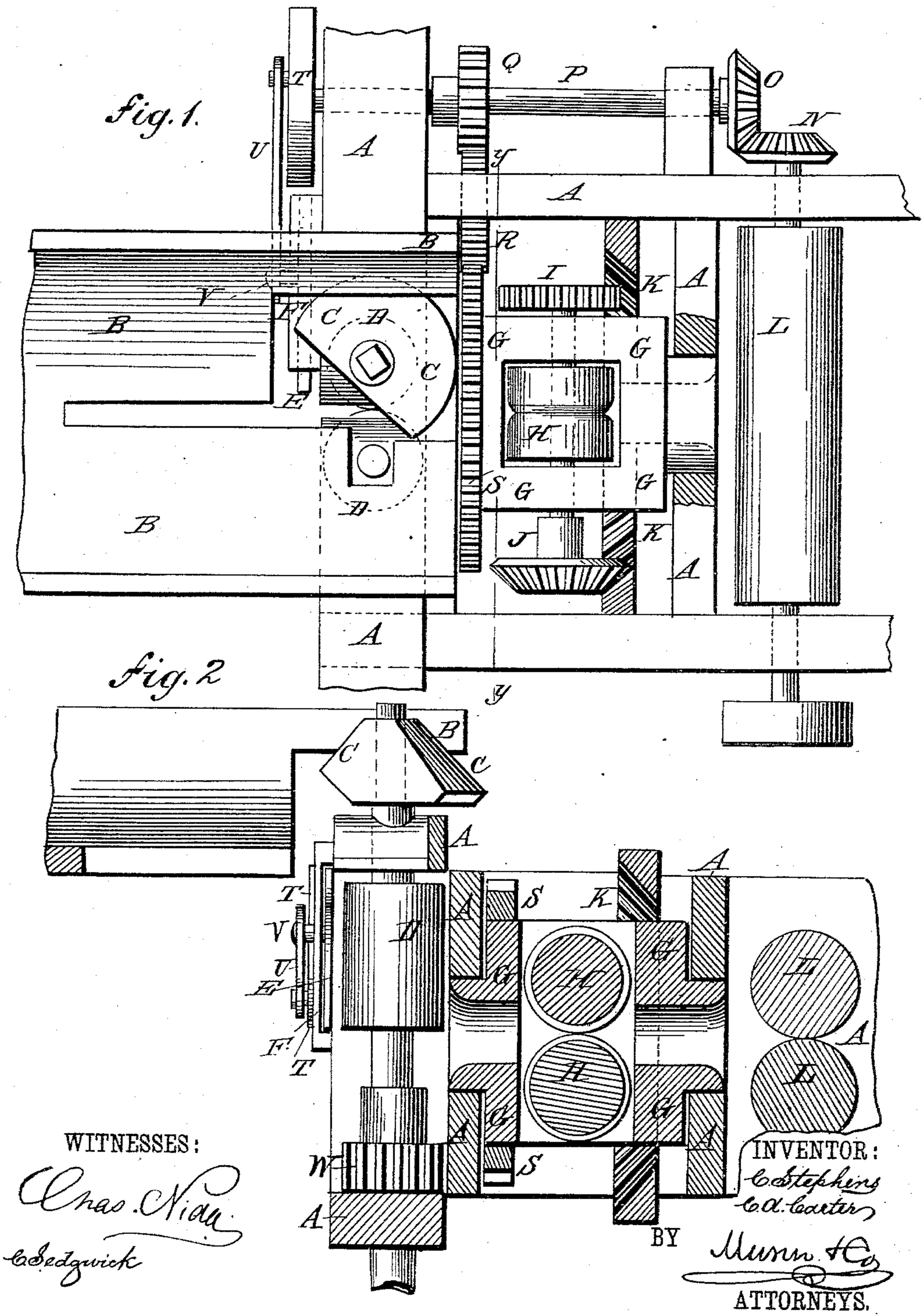

Fig. 2.

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Fig: 3.

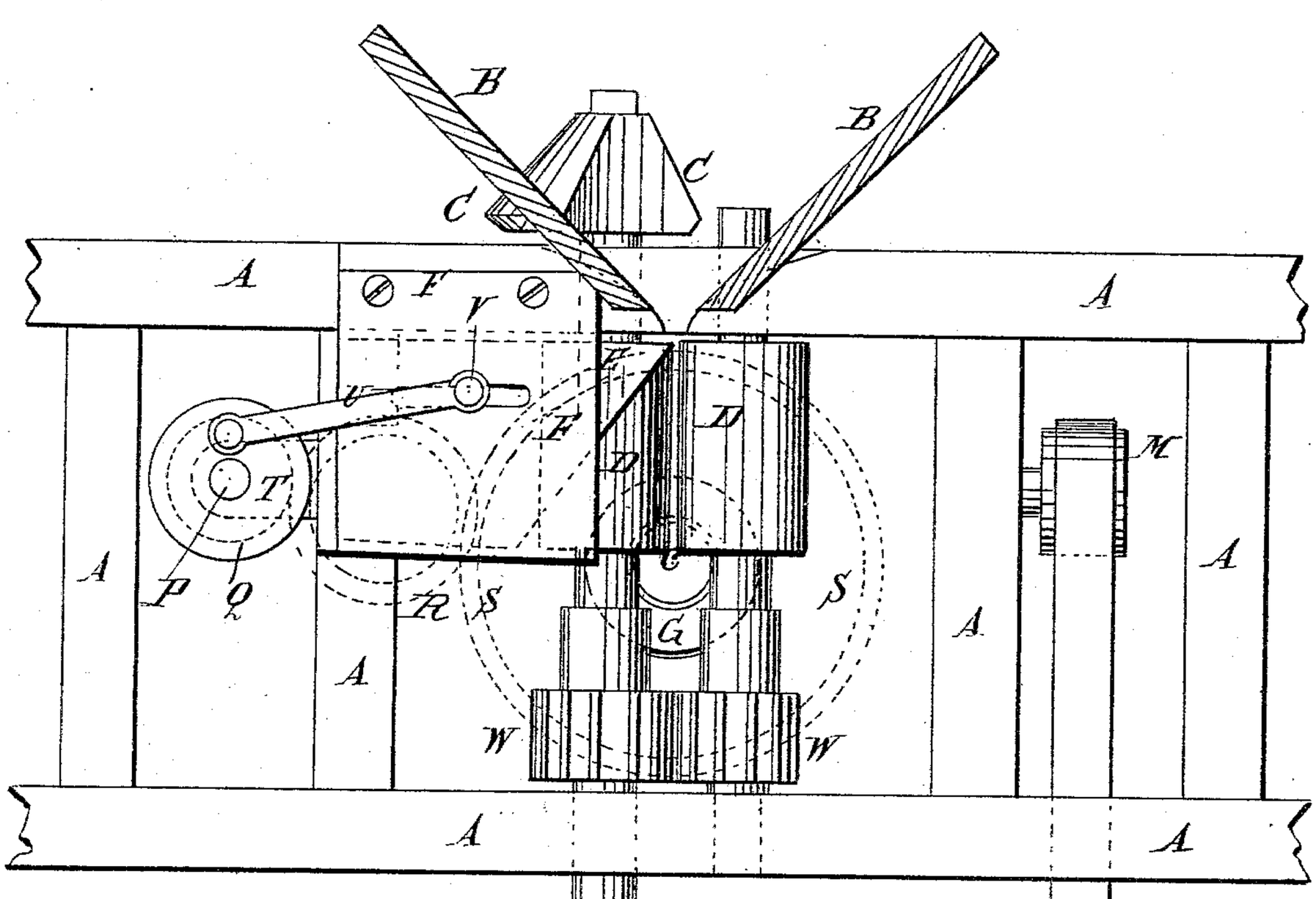
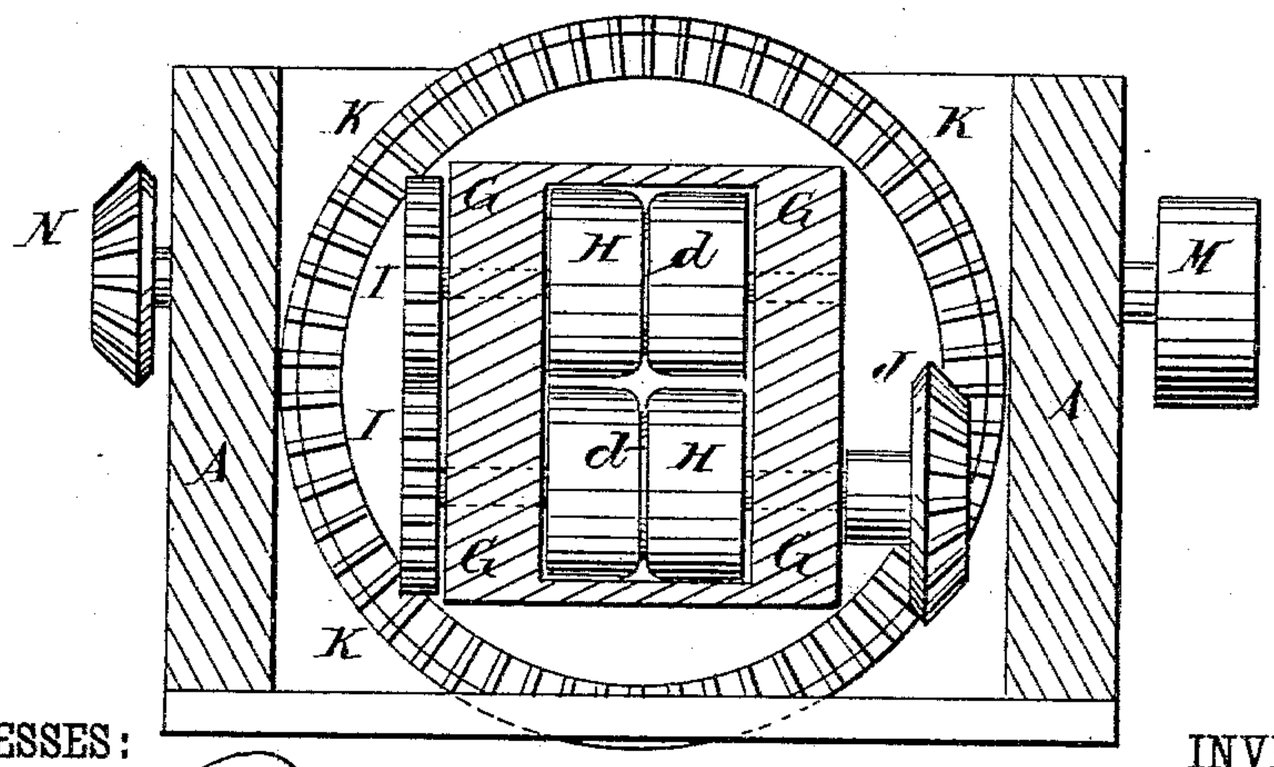


Fig: 4.



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UNITED STATES PATENT OFFICE.

CYRUS STEPHENS AND CHARLES A. CARTER, OF LEWIS CREEK, INDIANA.

STRAW-ROPE MACHINE.

SPECIFICATION forming part of Letters Patent No. 369,479, dated September 6, 1887.

Application filed April 20, 1886. Serial No. 199,518. (No model.)

To all whom it may concern:

Be it known that we, CYRUS STEPHENS and CHARLES A. CARTER, both of Lewis Creek, in the county of Shelby and State of Indiana, have invented a new and useful Improvement in Straw-Rope Machines, of which the following is a full, clear, and exact description.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of our improved machine, parts being broken away. Fig. 2 is a sectional side elevation of the same. Fig. 3 is a front elevation of the same, partly in section, and parts being broken away. Fig. 4 is a sectional front elevation of the same, taken through the line *y y*, Fig. 1.

The object of this invention is to provide machines for making straw ropes for grain-binding harvesters, constructed in such a manner as to form the ropes rapidly and of nearly uniform size.

The invention also consists of the construction and combination of various parts of the machine, as will be hereinafter fully described.

A represents the frame of the machine, which can be made of such a shape and size as the construction of the harvester to which the machine is to be applied may require. To the front top bar of the frame A is attached a triangular trough or hopper, B, to receive the loose straw from which the rope is to be made. In the inner part of the bottom of the hopper B is formed a slot, *a*, and in the front top bar of the frame A is formed a slot or groove, *b*, in line with the slot in the hopper-bottom.

The loose straw in the hopper B is pressed down through the slot in the hopper-bottom and in the bar of the frame A by a cam, C, attached to the upper journal of one of the vertical rollers D, the journals of which revolve in bearings in the front top and bottom bars of the frame A. The cam C projects inward through an opening in the inner part of one side of the hopper B, is made conical in its upper part, so that the straw will not lodge on its upper side, and has one of its sides cut away, so that the inner ends of the straws will fall past the said cam into the lower part of the said hopper and will be forced out by the inwardly-inclined surface at the bottom edge of the said cam through the slot in the hopper-bottom.

As the inner ends of the straws are being pressed down through the slot in the hopper-bottom, they are separated and forced downward one or two at a time by a tapered plate, E, sliding in ways on the inner side of a plate, F, secured to the front top bar of the frame A. The sliding plate E is operated by a mechanism that will be hereinafter described.

G is a rotary block, the journals of which revolve in bearings in cross-bars of the frame A, and are made hollow or provided with a passage, the forward end of which passage is of funnel shape.

The middle part of the rotating block G is mortised transversely, and in the space thus formed are placed two rollers, H, arranged parallel with each other, at right angles with the axis of the said block and upon the opposite sides of the said axis, so that the straws in passing through the block G will pass between the said rollers H. The rollers H have annular grooves *d d* around their middle parts, to cause them to press the straws together and to take a firm hold upon the said straws. The journals of the rollers H project, and to the said journals, upon one side of the rotating block G, are attached gear-wheels I, of equal size, the teeth of which mesh into each other, so that the said rollers will be revolved in opposite directions and at the same speed. To the journal of one of the rollers H, at the other side of the block G, is attached a beveled gear-wheel, J, the teeth of which mesh into the teeth of the internally-toothed beveled gear-wheel K, rigidly attached to the frame A, so that the rollers H will be revolved by the revolution of the said block G. By this construction, as the straws pass through the block G between the rollers H H, they will be twisted into a rope by the revolution of the said block and the action of said rollers, and will be fed forward by the revolution of the rollers H. As the rope passes out through the hollow rear journal of the rotating block G, it enters between the horizontal rollers L, by the revolution of which it is drawn from the said block G.

The rollers L are placed one above the other and at right angles with the axis of the ro-

tating block G, and are journaled to the frame A. To a journal of one of the rollers L is attached a pulley, M, to receive a belt from the driving mechanism of a harvester or other power. To a journal of one of the rollers L, at the other side of the frame A, is attached a beveled gear-wheel, N, into the teeth of which mesh the teeth of a beveled gear-wheel, O, attached to the rear end of the shaft P. The shaft P revolves in bearings attached to the frame A, and to its middle part is attached a small gear-wheel, Q, the teeth of which mesh into the teeth of an intermediate gear-wheel, R, journaled to the frame A. The teeth of the intermediate gear-wheel, R, mesh into the teeth of the large gear-wheel S, attached to the forward journal of the rotating block G, so that the said block will be revolved from the rollers L.

To the forward end of the shaft P is attached a crank-wheel, T, to the crank-pin of which is pivoted the end of a pitman, U. The other end of the pitman U is pivoted to a pin, V, attached to the tapered sliding plate E, and which projects through a slot in the guide-plate F, as shown in Fig. 3, so that the said sliding plate will be operated from the rollers L.

The driving-gearing is designed to be so arranged that one or two straws will be fed down to the rollers D with such frequency that additions will be made to the strand of the rope every two or three inches.

To the lower journals of the rollers D are attached equal gear-wheels, W, the teeth of which mesh into each other, so that the said rollers D will be revolved in opposite directions and at the same speed. One of the lower journals of the rollers D projects to receive a pulley or gear-wheel, so that the said rollers can be revolved from the driving mechanism of a harvester or other power. The rollers D H L are made of rubber or are faced with rubber to cause them to take a firm hold upon the straw, and may be made smooth or may be corrugated, as may be desired.

The operation of the machine is as follows: A quantity of straw is placed in the hopper B, and the machine is started. At each revolution of the cam C, as the vertical face formed by cutting away a part of the said cam comes next to the straw, the straw drops down at the side of the said vertical face, and the beveled edge of the said cam separates a wisp of straw from the straw in the hopper and forces the said wisp down through the slot in the bottom of the hopper, so that the forward end of the said wisp will be forced between the upper ends of the said rollers D. As the wisp of straw is caught by the rollers D, the triangular plate or slide E moves forward, pushing the wisp of straw down between the said rollers D, so that by the time the forward end of the wisp of straw which enters the opening in the rotary block G comes into contact with the rear part of the wisp of straw previously inserted and is caught by the rollers H the rear end of the said wisp will have been freed from the said rollers D by the action of the said slide, being pushed off of the lower ends of said rollers D at this juncture by the slide. As the block G revolves, the wisp of straw is carried forward by the revolution of the rollers H and the revolution of the rollers L, between which the twisted rope passes out of the machine, and the said wisp is twisted by the revolution of the block G. The twist applied to the part of the wisp of straw between the rollers H and L is prevented from running forward by the rollers L, and is thus made to form the straw rope. The part of the wisp of straw in the rear of the rollers H is free, so that the twist applied to the said wisp will run off at its rear end, and the straw will be free from twist as it passes between the rollers H.

Having thus fully described our invention, we claim as new and desire to secure by Letters Patent—

1. In a straw-rope machine, the combination, with the frame A, the feed-hopper B, having the slot in its bottom, the feed-rollers D, and a driving mechanism, of the cam C, the tapered sliding plate E, means for actuating the cams, and the pitman U and crank-wheel T, substantially as herein shown and described, whereby the straws will be fed to the said feed-rollers, one or two at a time and at regular intervals, as set forth.

2. In a straw-rope machine, the combination, with the frame A, the feed-hopper B, having a slot in its bottom, the cam C, means for actuating said cam, the tapered sliding plate E, the pitman U, crank-wheel T, the feed-rollers D, the discharge-rollers L, and a driving mechanism for said rollers, of the rotating block G, having hollow journals journaled to the said frame and having interior space, and the rollers H, placed within said block at right angles with the axis of the said block and at the opposite sides of the said axis, and a driving mechanism for said block and rollers, said rollers H H revolving in a plane at right angles to the plane of rotation of the said block, substantially as herein shown and described.

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Witnesses:
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