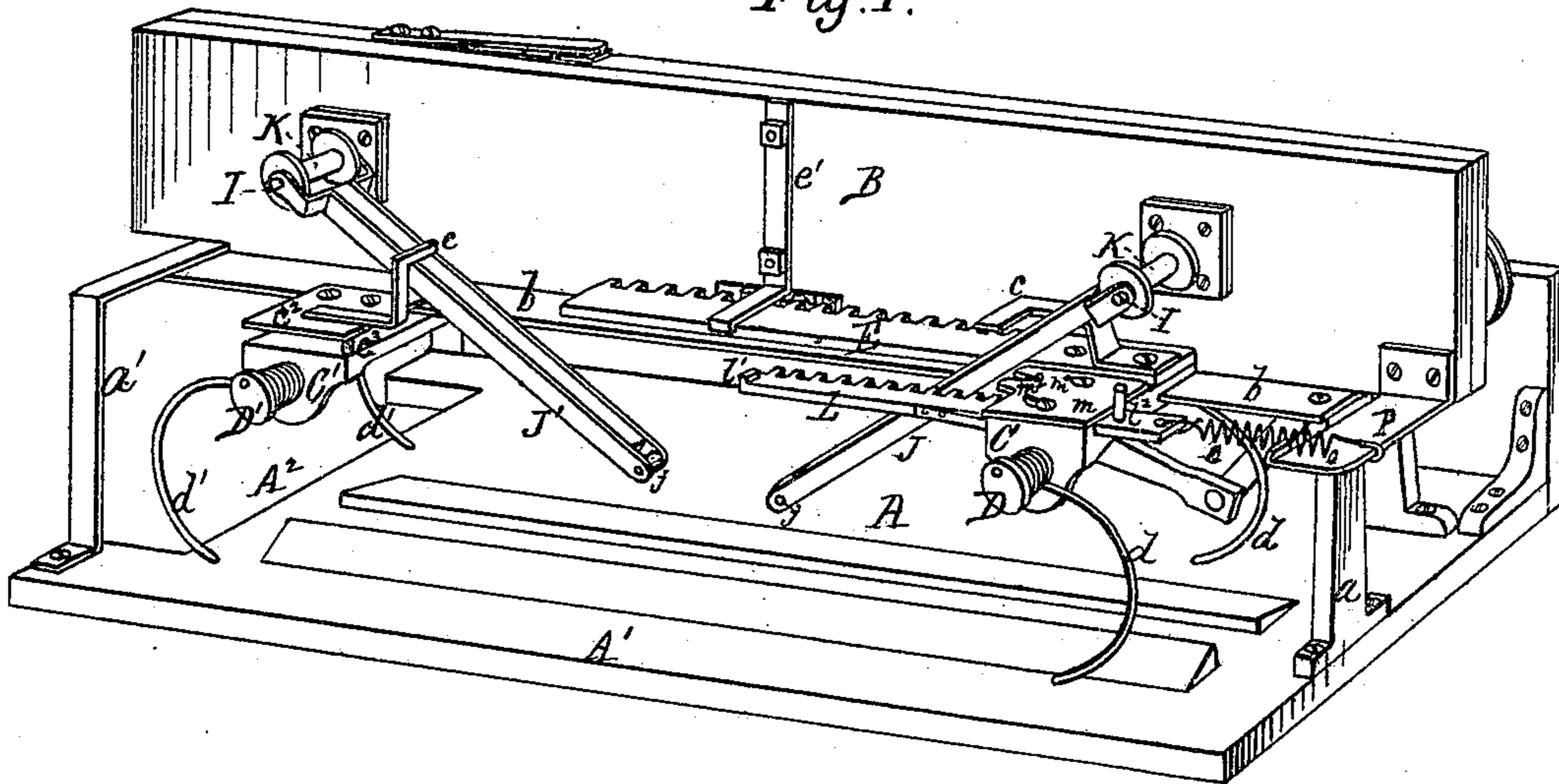


# GRAIN BINDER.

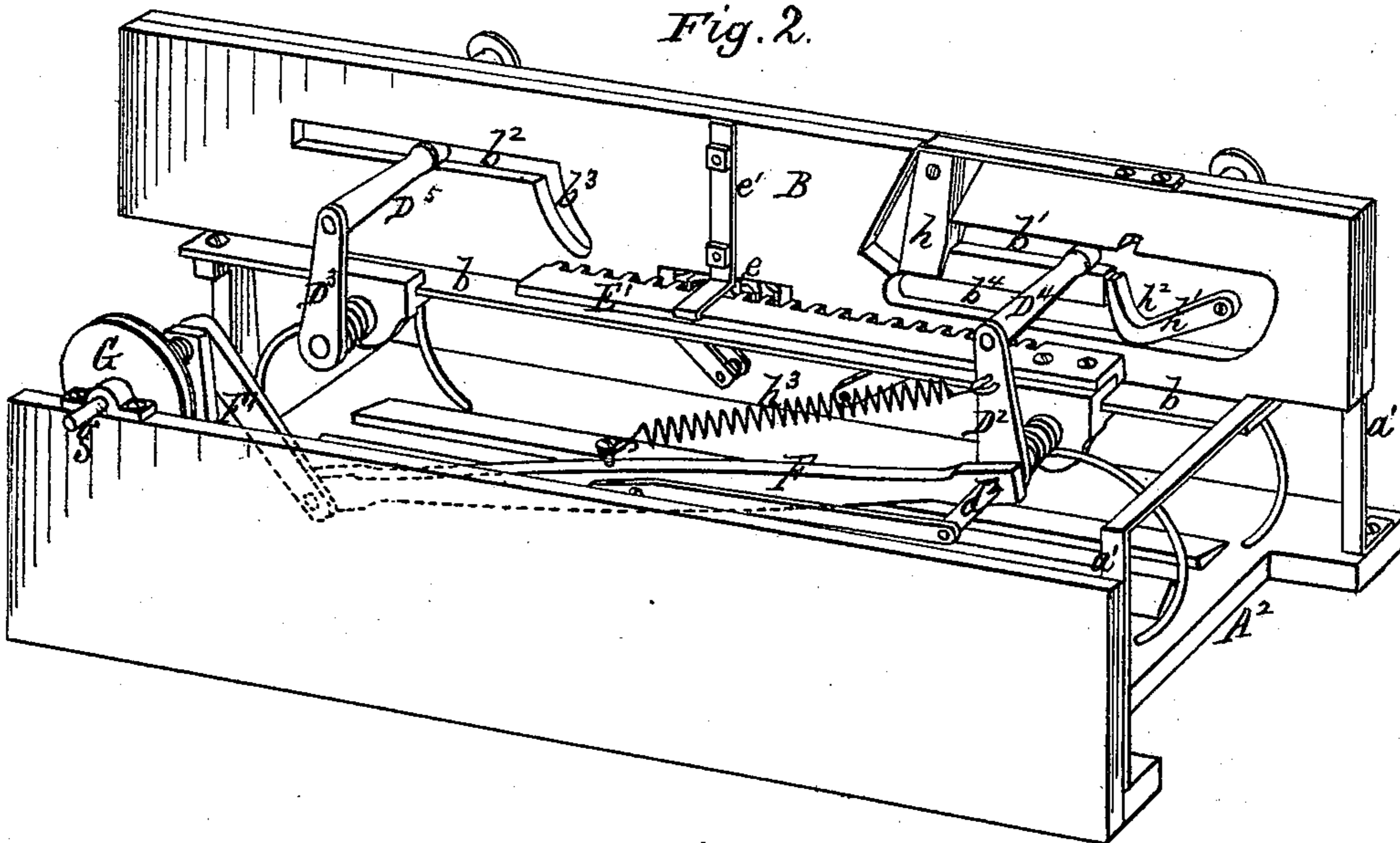
No. 175,785.

Patented April 4, 1876.

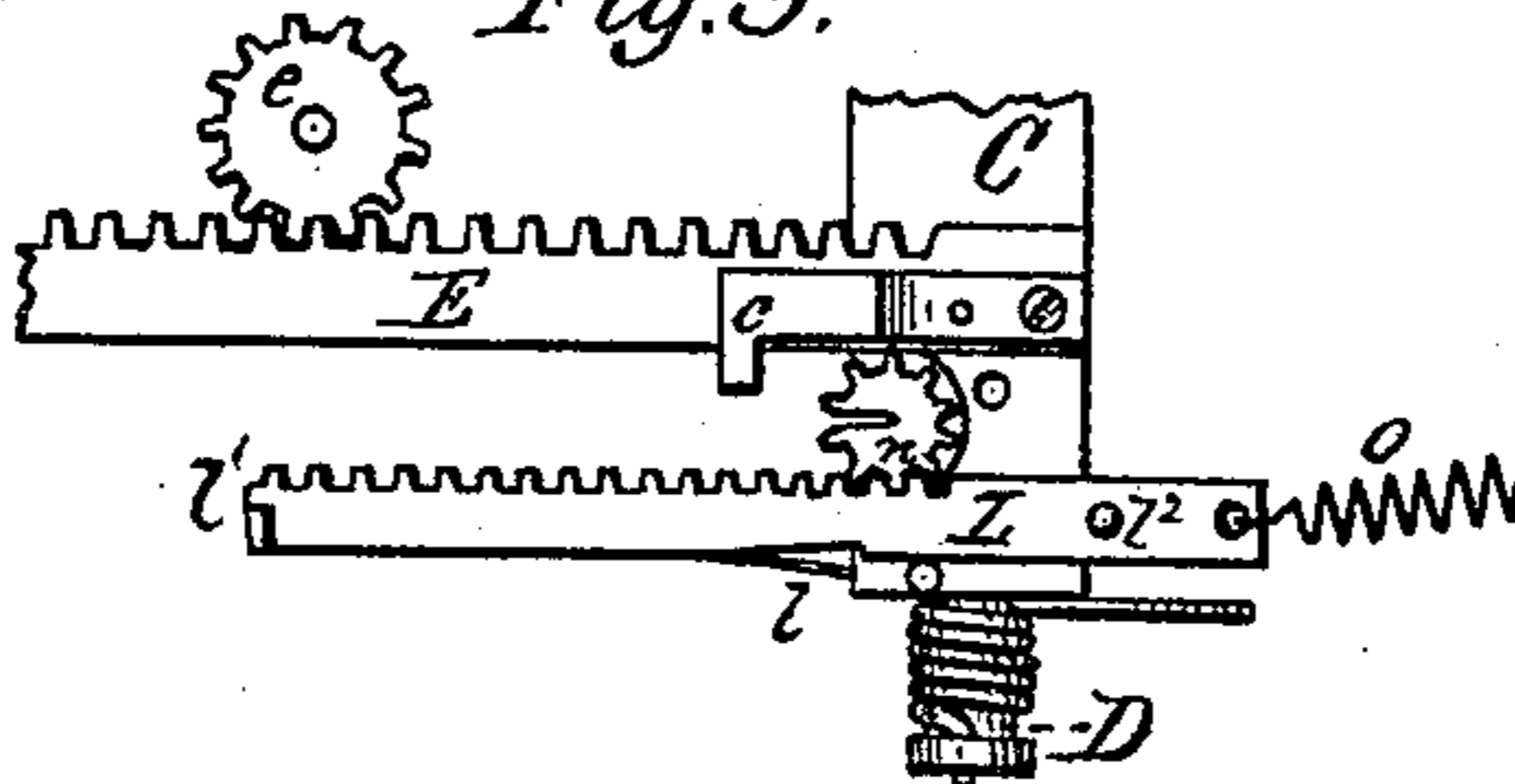
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



Witnesses:  
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Inventor:  
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# UNITED STATES PATENT OFFICE.

CHARLES L. TRAVIS, OF GREAT VALLEY, NEW YORK, ASSIGNOR TO THE  
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## IMPROVEMENT IN GRAIN-BINDERS.

Specification forming part of Letters Patent No. 175,785, dated April 4, 1876; application filed  
July 23, 1875.

*To all whom it may concern :*

Be it known that I, CHARLES L. TRAVIS, of Great Valley, county of Cattaraugus and State of New York, have invented a new and useful Improvement in Grain-Binder, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, making part of this specification, in which—

Figure 1 is a perspective view of my improved binder attachment taken from the grain side. Fig. 2 represents a similar view taken from the opposite side, and Fig. 3 is a plan view of the wire-twisting mechanism.

Similar letters of reference denote corresponding parts of the machine wherever used.

The invention relates more particularly to the means for effecting the discharge of the bound bundles at the rear of the machine, out of the way of the machine on its next round, and in connection therewith to certain details of arrangement of the binding devices, and consists, first, in a novel arrangement of yielding and reciprocating compressor, whereby it is adapted to retain the bound bundle and carry it to the rear of the binder-platform, and there, with the aid of the wire-carrying arm, to discharge it upon the ground, as hereinafter explained. It further consists in a novel arrangement of elastic gavel compressors, in combination with the vibrating wire-carriers, the latter being actuated by the movement of the compressors, and said parts operating to compress the gavel, carry the wire around the same, and to discharge the bound bundle, as hereinafter explained. The invention further consists in a novel combination of compressors, wire-carriers, and traveling twisting-wheel and actuating-rack, as hereinafter explained.

In the accompanying drawing, A represents a binder-platform, designed to be connected with the grain-platform of a reaper, behind the main frame, in a manner substantially as explained in Letters Patent granted to me March 9, 1875, No. 160,732, or in another application of even date herewith, but it may be applied to other forms or constructions of harvesters. The front or face side A' of this platform is open, to receive the grain delivered

thereon from the grain-platform, and its outer or stubble side is provided with an upright or fender board, which serves to stop the grain and prevent its being carried beyond the binding devices. Over this platform, midway of its width, or thereabout, on suitable standards *a a'*, is secured a bar or way, B, placed longitudinally of the platform, and made in the form of an inverted T, the lower horizontal flanges *b* of which serve as ways for reciprocating blocks C C', pendent thereon. The rear supporting-standard *a'* is made angular, or in crank form, striding the rear end of the platform, and fastened at or near the edges thereof, in such manner as to permit the discharge of the bound bundles at said end, between the upright portions of said standard or support *a'*. The traveling-blocks C C' are provided with bearings for transverse rock-shafts D D', to which the compressors *d d'* are attached, said compressors being composed each of a series of elastic rods or arms bent into the form of a half circle, more or less, the two series facing each other with their concave sides inward, the teeth being united to their shafts by coils or otherwise, forming springs, which permit them to yield to the varying bulk of the gavel clasped between the two series. Rack-bars E E' arranged on opposite sides of the upright part of bar or guide B adjacent thereto, and resting upon the horizontal ways *b b*, are connected one with each of the blocks C and C', and both mesh with an intermediate pinion, *e*, mounted on a vertical pivot in a slot in the bar B. Guide-brackets *e'*, attached to the bar B, serve to steady the longitudinal movement of the racks. The shaft D<sup>1</sup> is extended beyond the compressor *d'* at its rear or stubble end, forming a wrist or pivot, *d*<sup>2</sup>, to which the forked end of a pitman, F, is attached, the opposite end of said pitman being connected with a crank, F', on a shaft, *g*, to which motion is imparted by a pulley or wheel, G, by band or gearing from any convenient or suitable shaft on the machine truck. By this arrangement, through the rotation of the crank F', a reciprocating movement is imparted to the block C', and its compressor *d'*, and thence

through the racks E E' and pinion e, in an opposite direction, to the block C and its compressor d.

The shafts D D<sup>1</sup> are provided at or near their rear ends with crank-arms D<sup>2</sup> D<sup>3</sup>, having return arms or wrists D<sup>4</sup> D<sup>5</sup>, arranged above and substantially parallel with the shafts D D<sup>1</sup>, said arms or wrists entering slots or cam-grooves b<sup>1</sup> b<sup>2</sup> in the rear face of the bar B, and being provided with friction-rollers working therein. The groove b<sup>2</sup> is horizontal for the greater part of its length, but at its inner or rear end has an angular drooping extension, b<sup>3</sup>, in following which the crank-arm D<sup>3</sup> imparts a rocking motion to the shaft D as it approaches the end of its gathering or operative throw, causing the compressing-fingers d to be vibrated for compressing and lifting the gavel. The groove b<sup>1</sup> is made double, or in the form of an endless groove or path, the crank-arm D<sup>2</sup> in its operative throw following the upper horizontal portion of the groove, and descending thence through an incline, rocking the fingers d<sup>1</sup>, forward and upward, for compressing and lifting the gavel in connection with the opposing fingers d, until the crank-arm reaches a lower horizontal portion, b<sup>4</sup>, of the groove or track, when a pivoted and weighted or spring latch, h, drops behind or over it and prevents its return. The arm D<sup>2</sup> is thus compelled to follow the lower groove b<sup>4</sup> on its return movement, and the compressor or compressing-fingers are thereby held rocked up into position to retain the bundle of grain until the block reaches, or nearly reaches, the end of its return throw, when the arm D<sup>4</sup> having passed under a latch, h<sup>1</sup>, passes up again to the upper part of the groove b<sup>1</sup>, permitting the compressors d<sup>1</sup> to be rocked backward for discharging or depositing the bundle. The latch h<sup>1</sup> is cut away on its upper face at h<sup>2</sup>, and a spring, h<sup>3</sup>, attached at one end to the crank-arm D<sup>2</sup> and at the other to the pitman F, serves to draw the wrist D<sup>4</sup> forward and downward into the depression thus formed, thus increasing the backward and upward throw of the fingers d<sup>1</sup> and insuring the discharge of the bundle, and the platform A being open or cut away at this point A<sup>2</sup>, between the legs of the support or standard a<sup>1</sup>, the bundle is deposited gently upon the ground behind the binder-platform. To the forward face of the bar B are secured stationary horizontal axles I I, one near each end, and upon these are pivoted vibrating wire-carrying arms J J' by their forked upper ends, and within the fork, and upon the shafts I are mounted the wire reels or spools K K, held to the shafts by any suitable device for preventing a too free rotation of the spools, and for giving the desired tension to the binding-wires wound thereon. The arms J J' pass down between the blocks C C', one in front of, and in the path of, each of said blocks; and, consequently, as said blocks are moved inward or toward each other, the pendent arms J

are vibrated inward and upward, a positive movement in the reverse direction being given to the arms J J', after the band has been applied to the bundle, by the angular arms c c, attached to the sliding blocks C C', said arms passing at the side of and above the arms J, and being provided each with a hook-piece or spur, which grasps the wire-carrying arm and causes it to be vibrated downward and outward toward the ends of platform A. The arm J' is thus made to follow the bundle-carrying compressor d<sup>1</sup>, and to assist in holding the bound bundle therein until the latter is rocked backward and upward, as explained for discharging the bundle, when the backward movement of said arm sweeps the bundle off the rear end of the platform and insures its being deposited on the ground.

The wires from the spools K pass through suitable guide-loops on the rear or outer faces of the arms J J', and thence over friction rollers or pulleys j at the ends of the arms, the two wires from said spools having their ends united by twisting prior to beginning the operation of binding; after which the ends will be united automatically, as the bundles are bound by devices as follows: The block C' is grooved transversely on its upper face, near its forward end, and in said groove is mounted a rack-slide, L, held in place by a cap cutter-plate, m. A toothed rack on the inner face of this slide engages with a twisting-pinion, n, the vertical slotted shaft of which is mounted in a bearing in the traveling block C. The pinion n is slotted vertically, the slot being formed between two of its teeth, and reaching to its axial center, and is so geared or set relatively to the rack-bar L, that, when the latter is at the inner end of its throw, as shown in Fig. 3, the open mouth of the slot faces inward toward the binding-wire. In this position the rack is locked by a spring-pawl, l, attached to the rack-bar, engaging with a shoulder on the block C, and said rack and pinion are thus moved forward or inward, overcoming the tension of a spring, o, holding the outer end of the rack, and connected with an arm, P, attached to the forward end of bar B, until the wires from the arms J J', passing underneath the gavel to be bound, enter the slot in the advancing pinion n. The inner end l' of the rack L has in the meantime passed through a guiding-slot in the block C', or formed between said block and a cap plate, c<sup>2</sup>, and a pin or spur, c<sup>3</sup>, coming in contact with the spring-pawl l, disengages the same, when the spring O draws the rack L outward, rotating the pinion n, and twisting the wires together. The cap-plate m is pivoted to the block C, near its inner edge, at m', and its outer edge is held to the block by a screw passing through a slot formed in the arc of a circle, of which pivot m<sup>1</sup> is the center, thus allowing said plate to be vibrated on its pivot. The inner face of this plate is provided with a slot or jaw, m<sup>2</sup>, located directly

above the slot in the pinion  $n$ , and serving to guide the wires thereto. The inner side of this jaw is provided with a sharp cutting-edge, resting in contact with the upper face of the pinion, and as the latter completes its twisting action, actuated by the rack-bar  $L$ , as explained, the spur at  $l'$  on said bar strikes the cap-plate, and vibrates it on its pivot, causing it to cut the wires midway of the twist, releasing the bound bundle, and leaving the ends of the wires from the two spools  $K$  united for repeating the operation. As the block  $C$  is withdrawn, the rack  $L$  comes in contact with a spur or shoulder on arm  $P$ , and is forced inward until it is again locked by the pawl  $l$  with the pinion  $n$ , in position to again receive the binding-wires. As the crank-arm  $L$  is forced inward, a pin,  $l^2$ , thereon comes in contact with the cutter-plate  $m$ , and causes it to resume its former position for guiding the wires to the pinion  $n$ , and for again cutting said wires. The wire-carrying arms  $J J'$ , when moved downward and outward away from each other, as explained, are made to assume a pendent, vertical, or nearly vertical position, with their swinging ends resting in close proximity with the surface of platform  $A$ , with the binding-wire stretched between them, and resting on the surface of the platform between two beveled parallel cleats,  $a^2 a^2$ , by means of which, or of a longitudinal groove in the platform, the grain delivered to the binder-platform  $A$  is raised clear of the wire, and deposited thereon between the arms  $J J'$ . The backward movement of the bound bundle upon the compressor-arms  $d^1$  is designed to be timed to correspond or nearly so to the forward movement of the machine, so that the relation of the bundle to the ground

at the time of its discharge will be nearly stationary, in such manner that the bundle merely drops gently upon the ground, and is not rolled or tumbled forward by the forward movement of the machine at the time of its discharge.

By this arrangement much of the thrashing out of the grain consequent upon the ordinary mode of discharging the bound bundles is avoided.

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

1. The yielding or elastic compressors  $d d^1$ , in combination with the vibrating wire-carrying arms  $J J'$ , operating substantially as described, the rear compressor  $d^1$  being adapted to carry the bound bundle to the rear of the platform, where it is discharged with the aid of the rear wire-carrier, substantially as specified.

2. The combination of the gavel-compressors, and the independently-vibrating wire-carrying arm or arms with the single actuating-crank, imparting a positive movement in both directions thereto, substantially as described.

3. The combination, with the reciprocating compressors  $d d^1$ , and vibrating wire-carriers  $J J'$ , of the traveling twisting-pinion  $n$ , and its actuating-rack  $L$ , arranged and operating substantially as described.

In testimony whereof I have hereunto set my hand this 1st day of July, A. D. 1875.

CHARLES L. TRAVIS.

Witnesses:

H. D. GORDON,  
L. L. TERRY.