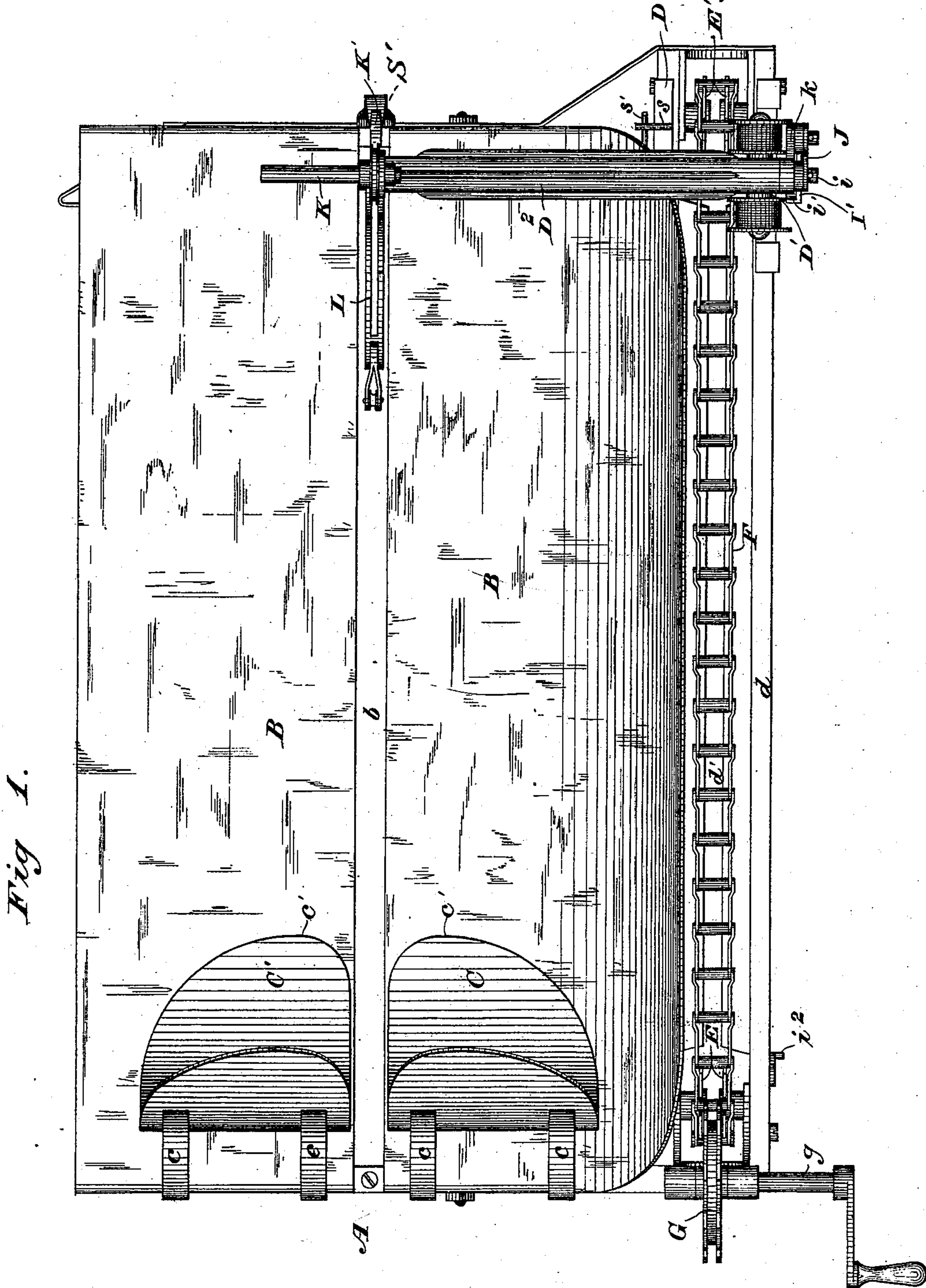


C. B. WITHINGTON.
Grain Binder.

No. 230,382.

Patented July 20, 1880.



WITNESSES

Wm A Skinkle
Geo. W. Breck.

INVENTOR

Charles B. Withington.

By his Attorneys

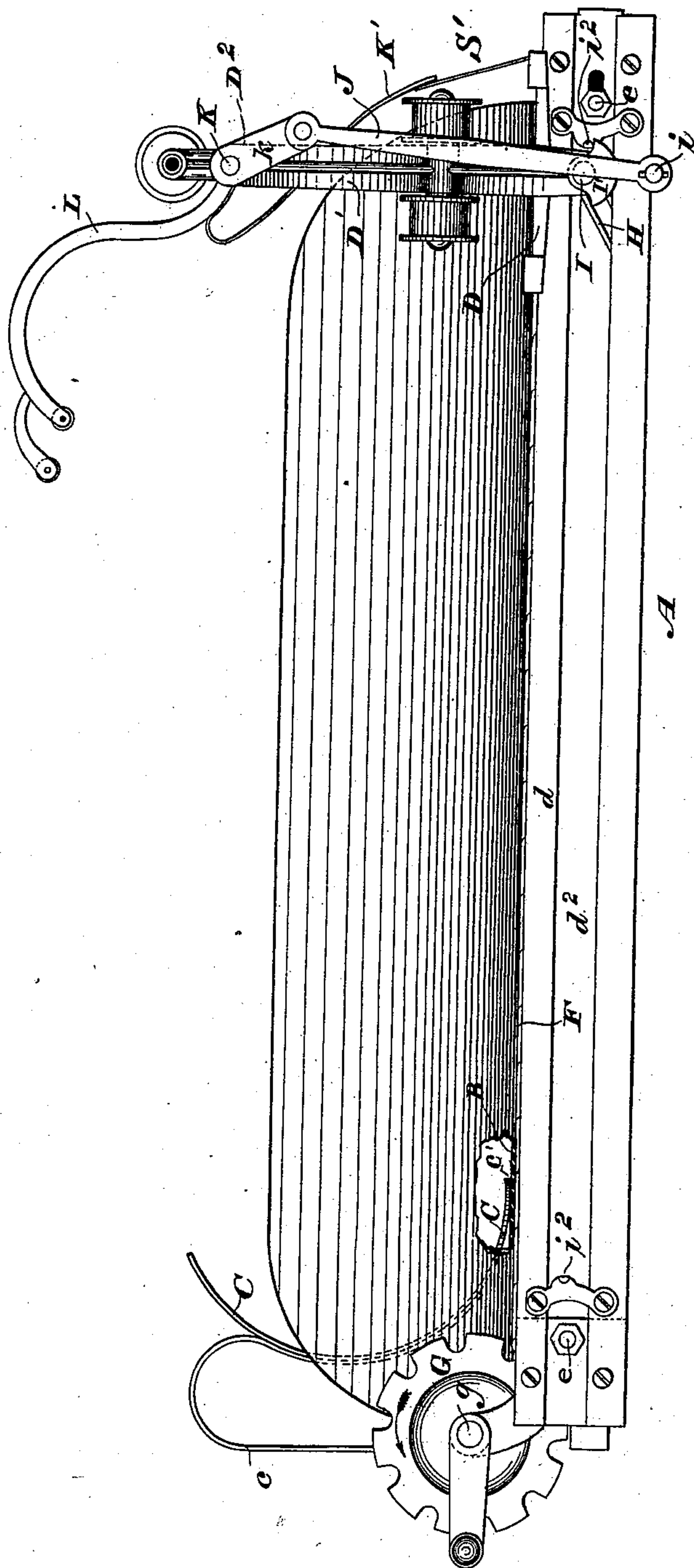
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Fig. 2.



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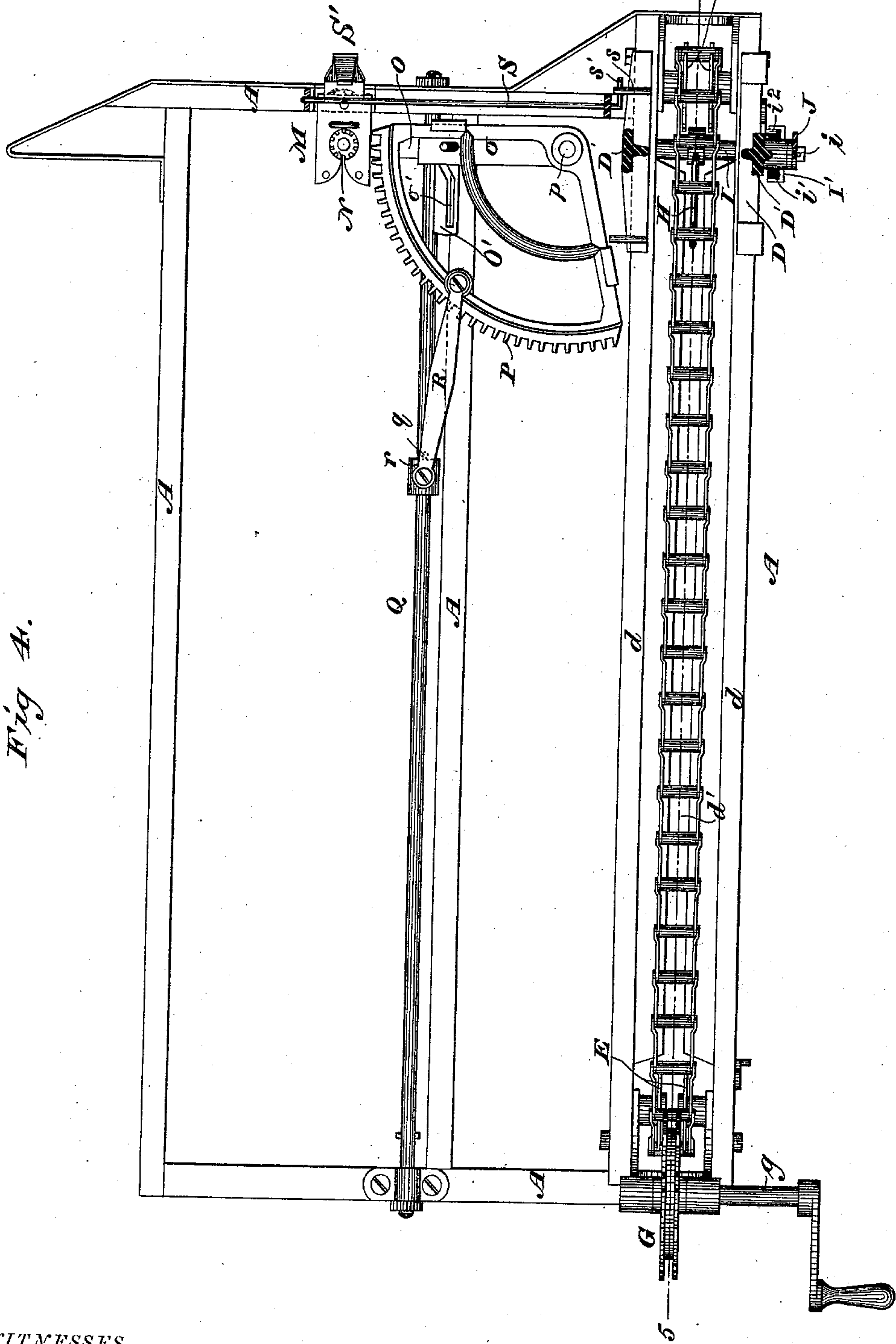


Fig 4.

WITNESSES

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UNITED STATES PATENT OFFICE.

CHARLES B. WITHINGTON, OF JANESVILLE, WISCONSIN, ASSIGNOR TO
C. H. & L. J. McCORMICK, OF CHICAGO, ILLINOIS.

GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 230,382, dated July 20, 1880.

Application filed March 16, 1878.

To all whom it may concern:

Be it known that I, CHARLES B. WITHINGTON, of Janesville, in the county of Rock and State of Wisconsin, have invented certain new and useful Improvements in Grain-Binders, of which the following is a specification.

My present invention more especially relates to automatic grain-binding mechanism of the class in which a reciprocating or vibrating binding-arm mounted on a traversing carriage operates in combination with a stationary grain-receiver; and its objects are to prevent the strain of the binding-wire from forcing the grain out of the receptacle, to secure the proper compression of the gavel, and to insure the proper insertion of the binding-wire into the twister during the act of binding. It also relates to mechanism, in connection with a reciprocating binding-carriage, for discharging bound gavels.

The subject-matter claimed will hereinafter specifically be designated.

In the accompanying drawings my improvements are shown as adapted to a reciprocating grain-binder organized and operating in a manner somewhat similar to that shown in Letters Patent of the United States No. 186,186, granted to me January 9, 1877. In that patent, however, the grain-binding mechanism is shown as working beneath the traversing carriage instead of above it, as in the present instance.

In the present instance, as in the patent above mentioned, my invention is shown as adapted to the use of two binding-wires. It is obvious, however, that my improvements may be used with a single wire and in machines differing in their details of construction from that herein shown—as, for instance, the binding mechanism might be arranged to vibrate either in a horizontal or vertical curved path, as shown in an application for Letters Patent filed by me November 10, 1875, and in Letters Patent of the United States No. 189,165, granted to me April 3, 1877.

Figure 1 represents a plan or top view of so much of the mechanism of a grain-binder as is necessary to illustrate the subject-matter herein claimed. Fig. 2 represents a side view thereof; Fig. 3, an end view; Fig. 4, a plan view, with the platform removed, showing the

mechanism for actuating the twister; and Fig. 5, a vertical longitudinal section on the line 5 5 of Fig. 4, through the driving-chain.

The binding mechanism is mounted in a suitable frame, A, secured upon or connected with the main frame of a harvester of any approved well-known construction in any suitable well-known way.

The cut grain is delivered in usual well-known ways upon a platform, B, which, in this instance, is shown as slotted longitudinally for the passage of the binder-head and binding-wire, as hereinafter described. At the gearing end of the platform is arranged a binding-receptacle, over which, when an endless apron is employed, the grain would be delivered upon the platform. It might, however, be swept over this receptacle by an intermittently-acting rake, or delivered sideways upon the platform thereby.

In this instance the receptacle is shown as divided vertically, correspondently with the slot *b* in the platform, and as composed of two independent compressing-shields, C C', mounted upon spring-arms *c*. The shields, in this instance, fit closely upon, but are not secured to, the platform, and are, consequently, by the construction described, capable of yielding as the gavel is compressed. The shields, it will be observed, are so curved as to embrace the gavel and prevent it from slipping upward under the strain of compression just before the end of the movement of the binding-arm in the act of compressing and binding the gavel, and yet are rigid enough to resist to some degree the pressure of the compressor, the effect being that the gavel is prevented from being forced up by the wire back over the receptacle, and the grain, in turn, causes the wire to enter the jaws of the twister promptly before it makes the half-turn necessary to carry the first wire from the front to the back of the twister before the second wire enters its jaws.

Instead of the slot in the receptacle and platform, ribs might be employed having grooves deep enough for the entrance or working of the mechanism.

The binding mechanism proper is mounted upon a carriage, D, reciprocating on a guideway, *d*, secured upon the frame A, and having

a vertical slot, d' , and a horizontal slot, d^2 , extending nearly throughout its whole length, each slot intersecting the other, so as to form an unobstructed central space.

5 Double sprocket-wheels $E E'$, mounted on suitable shafts e at each end of the guideway, carry an endless chain, F , composed of wide links traveling in the vertical slot of the guideway above mentioned. These links it will be
10 observed are made wide, and the chain runs at each end around the pulleys $E E'$, which are arranged in pairs on each side of the guideway on independent stud-shafts secured thereon, so as to leave an unobstructed space between them, for a purpose hereinafter described.

15 The chain is rotated continuously in one direction by means of a sprocket-wheel, G , mounted on a shaft, g , driven in any suitable well-known way.

20 A slotted link or intermittently-rotating stirrup-lever, H , is pivoted at one end to one of the links of the endless chain, while its other end is rigidly secured to a crank-shaft, I , mounted in the sliding carriage and adapted to traverse the horizontal slot of the guideway above mentioned. This crank-shaft it will be observed always travels between the upper and lower sides of the endless chain, while the slotted end of the link travels with
30 the chain, and will, consequently, move horizontally in one direction, pass up between the pulleys at the ends of the guideways, return backward on the opposite side of the guideway, and again descend, thus alternately and
35 intermittently making a half-revolution at each end of its traverse.

40 A standard, D' , mounted upon the traveling carriage, carries an overhanging arm, D^2 , in which a rock-shaft, K , is mounted, a binding-arm, L , being secured upon and vibrating with or around this rock-shaft in a vertical plane.

45 A crank, i , on the crank-shaft I is connected, by a pitman, J , with the crank k of the rock-shaft K above mentioned. The crank i , of course, revolves intermittently with its crank-shaft, but is shorter than the crank k ; consequently the shaft K is only rocked or vibrated intermittently instead of being revolved, as it
50 would be were the cranks of equal radius.

55 A guide-slot, i' , is formed concentrically with the crank-shaft in an enlarged hub or shell, I' , secured upon it, which guide-slot, at proper intervals, passes over stop-pins i^2 on the ends of the guide-frame at the moment when the link is turning around its guide-pulleys with the chain. The binding-carriage is, consequently, held positively locked at this moment, while the crank-shaft is rotating, which
60 is an important feature, as at these moments the binding-arm is either opening or closing, and the relative position of the parts is such that, but for this locking mechanism, there might be a tendency of the binding-carriage
65 to move improperly, which would impede the effectiveness of the operating mechanism.

The drawings show the binding-arm as ele-

vated and about to move forward to grasp a new bundle.

The construction and operation of the parts 70 above described is similar to that shown in my patent of January 9, 1877, above mentioned.

A binding-head, M , and its sectional twister-pinion N , substantially the same in construction and operation as that shown and described 75 in Letters Patent No. 123,967, granted to me February 20, 1872, are shown as mounted on a plate or bar, O , capable of sliding longitudinally in a guide-arm, o , mounted on the traversing carriage.

80 A plate, O' , provided with a guide-slot, o' , slides transversely across the guide-arm o above mentioned. A guide-pin on the longitudinally-sliding arm o , above mentioned, works in the slot of this transverse guide. 85

The twister-pinions are operated at suitable intervals by means of a sector-rack, P , vibrating on a fulcrum, p , on the binding-carriage, with which sector-rack these pinions are automatically thrown into or out of gear by the 90 slide and guide-slot above described.

The sector-rack is vibrated at proper intervals by means of a pitman, R , pivoted thereto at one end, while its other end is pivoted on a sleeve, r , sliding on a guide-bar, Q , which sliding sleeve at the proper moment abuts against 95 a stop-pin, q , on the guide bar or rod, which pin may be adjusted back and forward with nicety by means of nuts and screws on the end of the guide-rod. 100

The construction and operation of this part of the apparatus is similar to that of my patent of January 9, 1877, above mentioned, and need not be more fully described here.

105 The same remarks apply to the construction and operation of the binding or wire-carrying arm and the method of supplying it and the twister with wire.

In operation the driving-wheel G revolves in the direction indicated by the arrow thereon. 110 Starting from the position shown in the drawings, the sliding carriage moves forward toward the receptacle, with the slotted link H traveling in the lower side of the guideway, and the binding-arm L consequently elevated, 115 the grain lying upon the platform being swept toward the receptacle by the binding-wire, which extends from the twister to the binding-head, and also by a spring-compressor, K' , which also serves another purpose, hereinafter 120 mentioned. As the binding-head approaches the receptacle the strain of the wire forces the grain against the shields O' , and so as to insure the insertion of the wire into the twister, and the gavel is then compressed, the shields 125 yielding under the strain to accommodate the advance of the binding mechanism to the end of its stroke. The binding-head having now reached the end of its forward movement, the link passes around the pulley at that end of 130 its guideway, turns the crank, and, consequently, brings down the binding-arm, carrying its wire into the twister. The carriage then retracts, the wire being twisted in its

backward movement. As the carriage reaches the limit of its backward movement a pin, *s*, thereon strikes a crank, *s'*, on a rock-shaft, *S*, carrying a spring discharging-arm, *S'*, which normally lies within the slot *b* in the platform, thus tilting it up and automatically discharging the bundle. As the binding-arm rises again to commence its forward movement the spring-compressor or tail-piece *K'* thereon strikes the discharging-arm *S'*, and restores it to its normal position, this operation being repeated at each reciprocation of the binding-carriage.

I do not broadly claim herein an abutment or abutments on the grain-platform to prevent the grain from being pushed back by the wire in its movement to encircle a fresh gavel. Neither do I broadly claim herein the combination of a reciprocating binding-arm and twister with an abutment on the platform to hold the grain against the strain of the binding-wire. Neither do I broadly claim herein the combination of a reciprocating vertically-vibrating binding-arm, a reciprocating twister, a slotted platform, a slotted grain-receptacle, and abutments upon the ends of the slots to hold the grain against the strain of the binding-wire.

What I claim as my invention is—

1. The combination, substantially as hereinbefore set forth, of the traversing binding-carriage, the binding-arm and twister reciprocating therewith, and the stationary yielding shields secured upon the grain-platform.

2. The combination, substantially as hereinbefore set forth, of the traversing binding-carriage, the reciprocating vertically-vibrating binding-arm, the reciprocating twister, the slotted platform, and the yielding compressing-shields.

3. The combination, substantially as hereinbefore set forth, with a reciprocating binding-carriage, of a discharging-arm or tripping mechanism operated by the movements of the carriage to discharge the bound gavel.

4. The combination, substantially as hereinbefore set forth, of a reciprocating binding mechanism, a discharging-arm or tripping mechanism actuated thereby to discharge the gavel, and a spring-compressor on the binding-arm to reset said mechanism after discharging the gavel.

5. The combination, substantially as hereinbefore set forth, of a reciprocating binding-arm and twister, a yielding receptacle, and a spring-compressor carried by the binding-arm, for the purposes specified.

In testimony whereof I have hereunto subscribed my name.

CHAS. B. WITHINGTON.

Witnesses:

JOHN R. BENNETT,
ROBT. D. WHITFORD.