

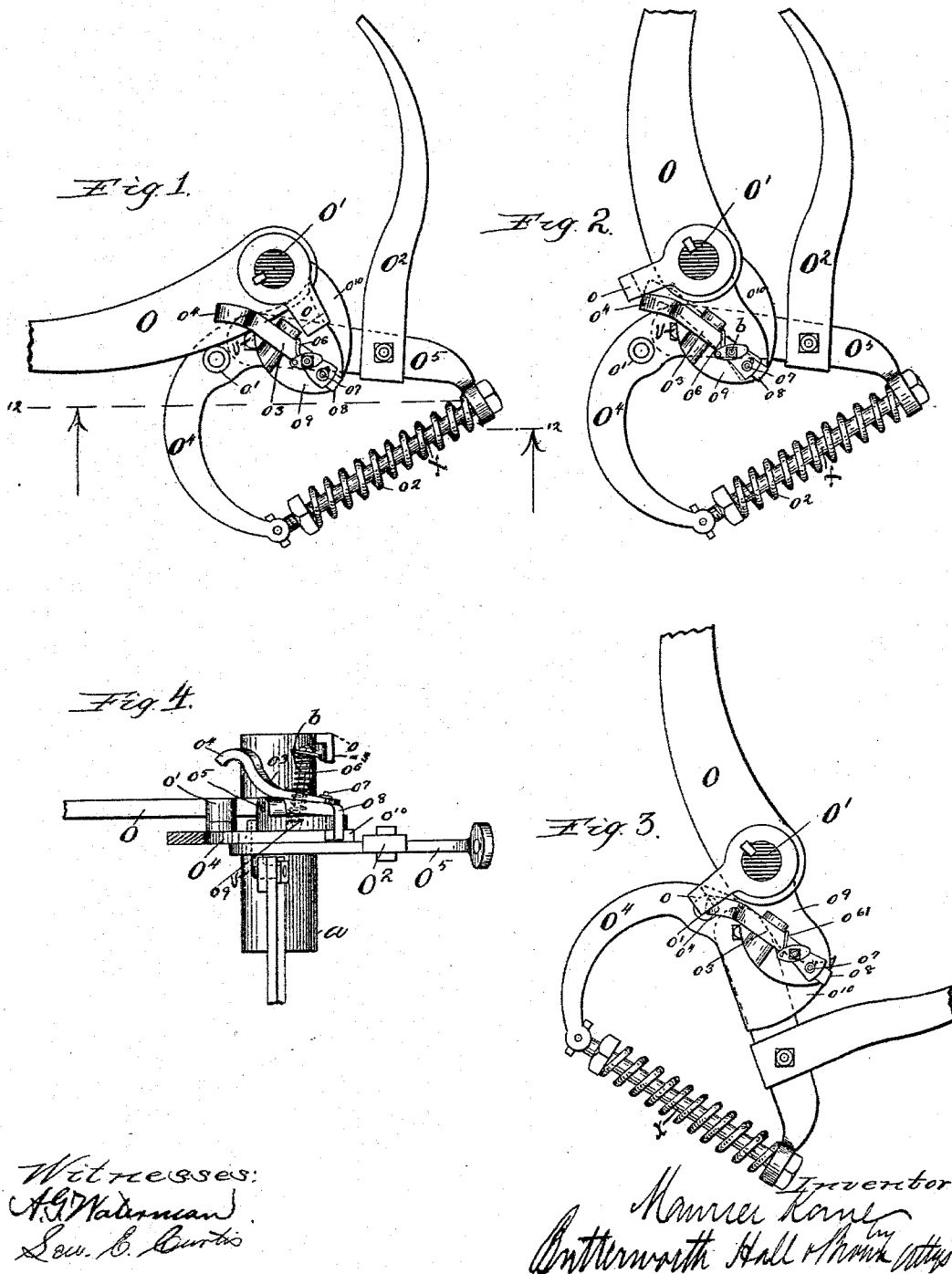
(No Model.)

2 Sheets—Sheet 1.

M. KANE.
GRAIN BINDER.

No. 495,044.

Patented Apr. 11, 1893.



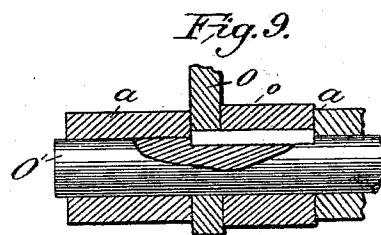
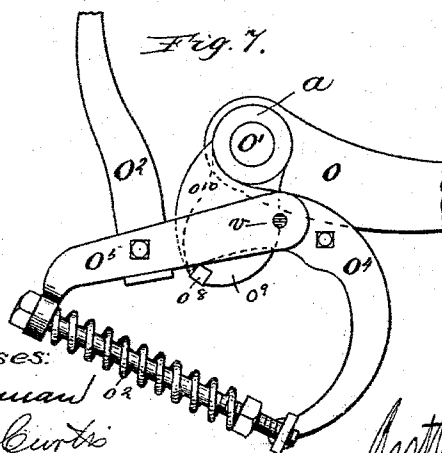
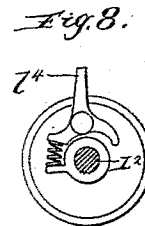
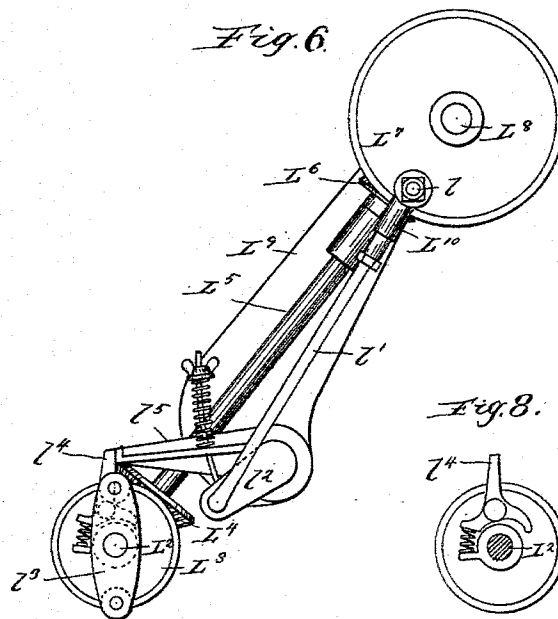
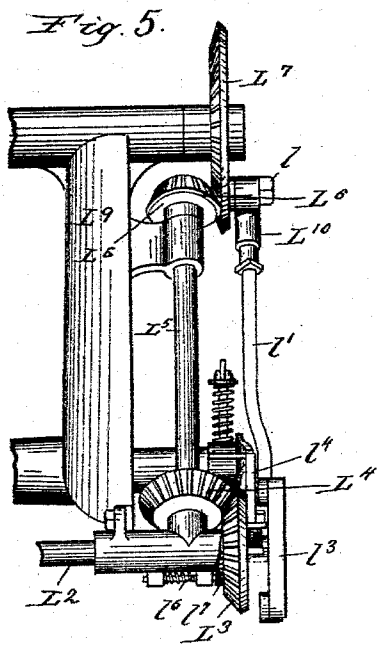
(No Model.)

2 Sheets—Sheet 2.

M. KANE.
GRAIN BINDER.

No. 495,044.

Patented Apr. 11, 1893.



Witnesses:

A. S. Waldman
Geo. E. Curtis

Inventor:

Maurice Kane
Antennorth Hall, New York City

UNITED STATES PATENT OFFICE.

MAURICE KANE, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WARDER, BUSH-
NELL & GLESSNER COMPANY, OF SPRINGFIELD, OHIO.

GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 495,044, dated April 11, 1893.

Application filed November 3, 1890. Serial No. 370,209. (No model.)

To all whom it may concern:

Be it known that I, MAURICE KANE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Grain-Binders, of which the following is a specification.

This invention relates to machines for binding grain and its object is to increase the effectiveness, and particularly to simplify the construction of the binding mechanism, proper.

It consists in the construction and arrangement hereinafter described and claimed.

Like letters refer to the same parts in the several figures of the drawings.

Figure 1. is a side elevation, looking from the front of the machine, of the compressing finger and the devices for operating the same, but showing such devices at rest. Fig. 2. is a similar view except that the devices are in position to begin action. Fig. 3. is a similar view except that the devices are shown as having acted to release the compressing finger. Fig. 4. is a longitudinal section on the line 12-12 Fig. 1, and looking from underneath. Fig. 5. is a detail view in front elevation of the gearing and connections for communicating motion from the packer to the knotter driving shaft. Fig. 6. is a side elevation of the same. Fig. 7. is a side elevation of the devices shown in Fig. 1 looking from the rear of the machine. Fig. 8. is a detail view of the pivoted dog, as applied to the wheel. Fig. 9. is a detail view partly in section of a portion of the shaft and inclosing housings and the needle arm and sleeve for the projecting toe arm keyed to such shaft.

I will now describe the gearing and the devices for communicating motion from the packer shaft to the knotter shaft. In a common form of grain binder the packer shaft rotates continuously, but the knotter driving shaft is only rotated at intervals or when a sufficient quantity of loose grain has been gathered and compressed to constitute a bundle, and it is customary at this last mentioned stage of the operation for the pressure of the bundle to trip a stop and set the knotting mechanism in operation. I design to employ this usual mechanism and make no claim

thereto but my invention resides in the arrangement of gearing for directly connecting the packer shaft to the knotter driving shaft and the combination therewith of devices for coupling and uncoupling such gearing.

Referring to Figs. 5 and 6 of the drawings L^2 designates the packer shaft which is continuously rotated preferably by a belt or chain connection with the harvester or in any other suitable manner and carries upon its outer end an arm L^3 provided with lugs upon its inside face as is usual. A part L^4 of the frame, supports housings for the packer shaft and for the knotter driving shaft L^5 , and a shaft L^5 is also supported by a bracket from this frame and carries at its lower and upper ends respectively the bevel gears L^4 and L^6 . A bevel gear L^7 is rigidly mounted upon the knotter driving shaft and meshes with the bevel gear L^6 . A bevel gear L^8 is loosely mounted upon the packer shaft and meshes with the bevel gear L^4 . On the outer face of the bevel gear L^8 is pivoted a dog L^9 , and a small spring tends to throw one wider end of the dog into the path of a lug on the inside of the arm L^3 , but is normally prevented from so doing by the contact of the longer and narrower end of such dog with the stop arm L^{10} , arranged upon the needle shaft. When however, the bundle becomes of the proper size to require binding it trips the stop in a well known manner and the small spring under the dog then throws the latter into the path of a lug on the rotating arm L^3 , and consequently such arm causes the bevel gear L^8 to rotate with it and to drive the knotter driving shaft, through the other bevel gearing. The stop arm is by another spring thrown into position to contact with the dog and thereby arrest the motion of the gearing driving the knotting mechanism, as shown, as the bundle is bound. L^{11} designates the bolt for connecting to the bevel L^7 , the socket L^{10} , which is secured by the pitman L^{12} to the crank on the needle shaft; but as these form no part of my present invention they will not be further described.

The above described mechanism is extremely simple, considering the purpose in view, and is direct and effective, in its action.

The next feature of the present invention

which will be described relates to the devices for operating the compressing arm and reference is made to Figs. 1, 2, 3, 4, and 7, of the drawings for an illustration thereof. O designates the needle arm which is mounted upon the shaft O'. Adjacent to the needle and upon the same shaft is rigidly secured the arm, o, which has a lateral projecting toe, s. A sleeve or rather a housing a is secured to the frame and affords a bearing for the needle shaft which housing has a depending bracket which latter supports a bent bolt v. Two curved bars O⁵ and O⁴ are pivoted at their inner ends upon this bent bolt and the lower ends of such arms or bars are connected by a longitudinal bolt x one end of which is pivoted to the bar O⁴ and the other end of which passes through an aperture in the end of the bar O⁵ and is provided with a limiting nut. This sleeve or housing may be divided as shown so as to allow the hub of the needle arm and of the projecting toe to rest upon and be fixedly secured to the shaft. A spiral spring o² encircles the bolt x, and is confined between an adjusting nut and the end of the bar O⁵ through which the bolt passes. Rigidly affixed to the bar O⁵ and projecting vertically therefrom is the compressing arm O², which arm is designed to present a bearing surface against which the needle arm and packers may press the bundle of grain, and as the bar O⁵ is free to slide on the bolt x, against the spring the compressing arm affords an elastic bearing surface.

Extending from the sleeve or housing before referred to is a bracket o⁹, carrying lugs in which is pivoted a latch o⁸, which pivot is designated by the letter o⁵. Projecting from this bracket o⁹ is a bolt b which passes through the latch and cam finger o³. The cam finger may turn upon the bolt and has a bent or convexed outer end o⁴ clearly shown in Fig. 4 of the drawings. A spiral spring o⁶ surrounds the bolt with its upper end secured to a washer at the upper end of the bolt and its lower end resting upon the top surface of the cam finger whereby the latch is normally pressed inwardly and the spring has its lower coil extended as at o⁶, and hooked over the upper side of the cam finger so as to normally pull the said finger downward, an elongated slot being made in the latter to permit such play on a guiding pin o⁷ projecting from latch o⁸ and extending through the cam finger o³. The bracket, o⁹, has a slot through which the latch may pass, and when the parts are at rest, the extension, o¹⁰, of the bar O⁴, is supported upon the latch, and the compressing finger, O², thereby held in an upright position. The bar, O⁴, has also a stud, o', projecting from its inner side forward of its pivotal point. The operation of these devices will now be set forth. Ordinarily the extension, o¹⁰, of the bar O⁴, rests upon the latch and as the compressing finger is attached to bar O⁵, which is connected to the

bar, O⁴, said compressing finger is held in an upright position. In this position the compressing finger affords a bearing surface against which the packers and the needle arm press the grain. When the needle bar is in its normal position, as is shown in Fig. 1., the bars, O⁴, and, O⁵, and compressing finger, O² are supported by the latch, but as the needle moves up it carries the arm, o, and its toe with it and such toe rides underneath the bent end of the cam finger and causing the same to turn on its pivot b, it pushes it out of the way and finally assumes a position above it as is shown in Fig. 2, of the drawings. After the needle bar has done its work, it goes back and carries with it the arm, o, and its toe; the latter is caused to strike and pass over the convex surface of the bent or curved end of the cam finger and thereby depresses the same and withdraws the latch from under the compressing bar or rather its attached bar, when these several bars will fall out of the way and permit the bundle to be discharged. The parts will then be in the position shown in Fig. 3. As the needle bar moves back to its original position, it bears upon the stud, o', and forces the bar, O⁴, and its connecting bar, O⁵, and the compressing finger, O², up into position for action in connection with the next bundle, where they are held by the latch as before mentioned.

It is obvious that a skilled mechanic may make many modifications of the details of this invention, without departing from the spirit thereof, and I therefore, wish it to be understood that I do not desire to limit myself to the exact construction shown and described.

What I claim, and desire to secure by Letters Patent, is—

1. In a grain binder the combination of a constantly rotating packer shaft having a clutching device affixed thereto, and a bevel gear loosely mounted thereon for engagement with the clutching devices at suitable intervals; of a knotter driving shaft having a bevel gear upon its end, a shaft intermediate of the knotter driving shaft and the packer shaft having bevel gears at each of its ends which respectively mesh with the bevel gears of the other two shafts; substantially as and for the purpose set forth.

2. In a grain binder the combination of a constantly rotating packer shaft provided with an arm having lugs on its inner side; a bevel gear adjacent to such arm loosely mounted on such shaft and provided with a spring actuated dog the normal tendency of which is to extend into the path of the lugs on such arm; a stop normally holding the dog out of the path of the lugs on the arm, and mechanism for periodically tripping such stop and thereby permitting the lugs to engage the dog; of a shaft intermediate of the knotter driving shaft and the packer shaft having bevel gears on its opposite ends which

respectively engage the bevel gears on the other two shafts; substantially as and for the purpose set forth.

3. In a grain binder the combination of a
5 needle shaft and a needle arm mounted thereon, a compressor finger pivoted on an axis independent of the needle shaft a lever connected with such compressor finger and pivoted upon the same axis therewith, a pivoted
10 latch normally supporting such compressor finger, a cam shaped finger on such latch and a toe connected with the needle shaft for operating against such cam to release the latch, and means for rocking the lever for returning
15 the compressor finger to its normal position after it has been dropped substantially as and for the purpose set forth.

4. In a grain binder the combination of the
20 needle shaft having a needle arm and a projecting toe secured thereto, a compressor finger pivoted independently of the needle shaft, and a spring pressed pivoted latch extending under and supporting such compressor finger, a cam finger being secured at one end to
25 the latch by a bolt and lateral slot, and another bolt passing through such cam finger at a point intermediate its ends, and through the latch a spiral spring resting upon such cam finger and having one of its ends secured
30 near the upper end of the bolt, and its other end hooked over the side of such cam finger; whereby the cam finger has a lateral play, and is returned to its normal position by such spring and may be operated upon by the toe

to release the latch in the movement of the
35 needle arm in one direction, or will move aside the cam finger without releasing the latch in the movement if the needle arm in the other direction; substantially as and for
40 the purpose set forth.

5. In a grain binder the combination of a
45 compressing finger secured to a pivoted bar, a second bar mounted upon the same pivot with the first bar and provided with a stud near its pivot, a bolt secured to the second
50 bar and passing through an aperture in the first bar, a spring encircling such bolt, a pivoted latch normally supporting the bars, a cam finger pivoted to the latch so as to have lateral play thereon, a coiled spring resting
55 upon said cam finger and having its end hooked over the side thereof, a needle shaft having a projecting arm provided with a toe, and a needle arm, substantially as and for the purpose set forth.

6. In a grain binder the combination of a
60 constantly rotating packer shaft, a bevel gear connected therewith, a knotter shaft having a bevel gear connected to one of its ends, a supplemental shaft having a beveled pinion
65 at each end arranged to respectively mesh with the inner faces of the bevel gears upon the packer and knotter shafts; substantially as and for the purpose set forth.

MAURICE KANE.

Witnesses:

A. G. WATERMAN,
E. C. MERRILL.