E. STUMPF.

SHOCKING MACHINE.

APPLICATION FILED FEB. 20, 1908.

1,041,898.

Patented Oct. 22, 1912.

5 SHEETS—SHEET 1.

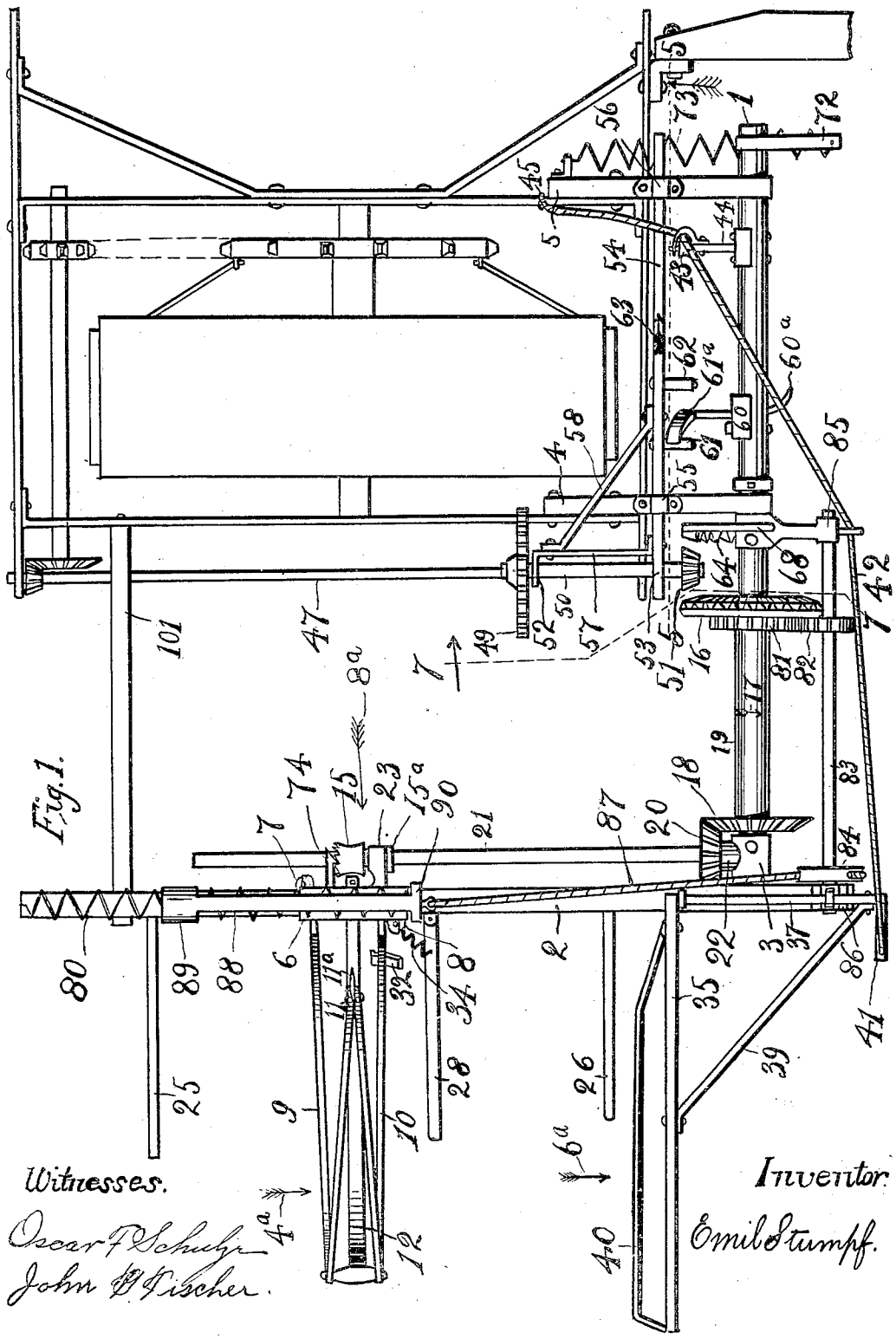

Fig. 1.

Witnesses.

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5 SHEETS—SHEET 2.

Fig. 2.

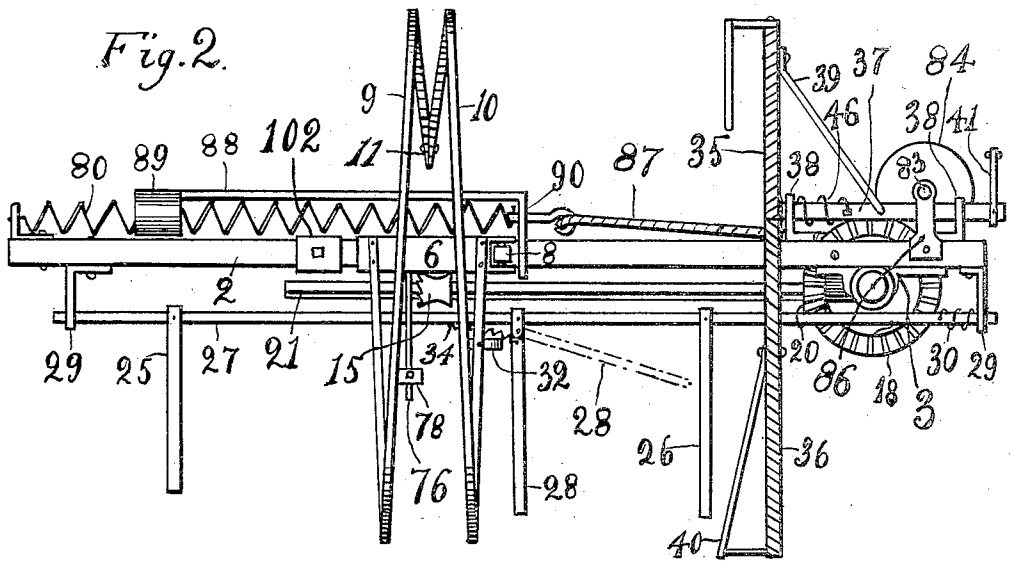
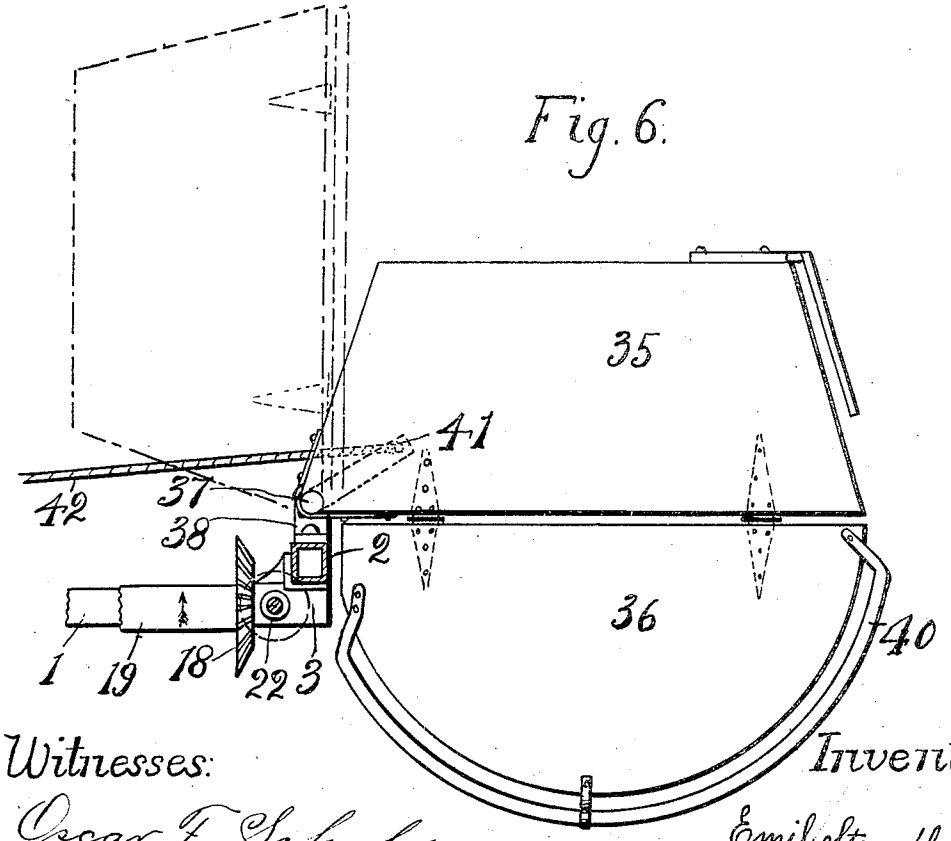


Fig. 6.



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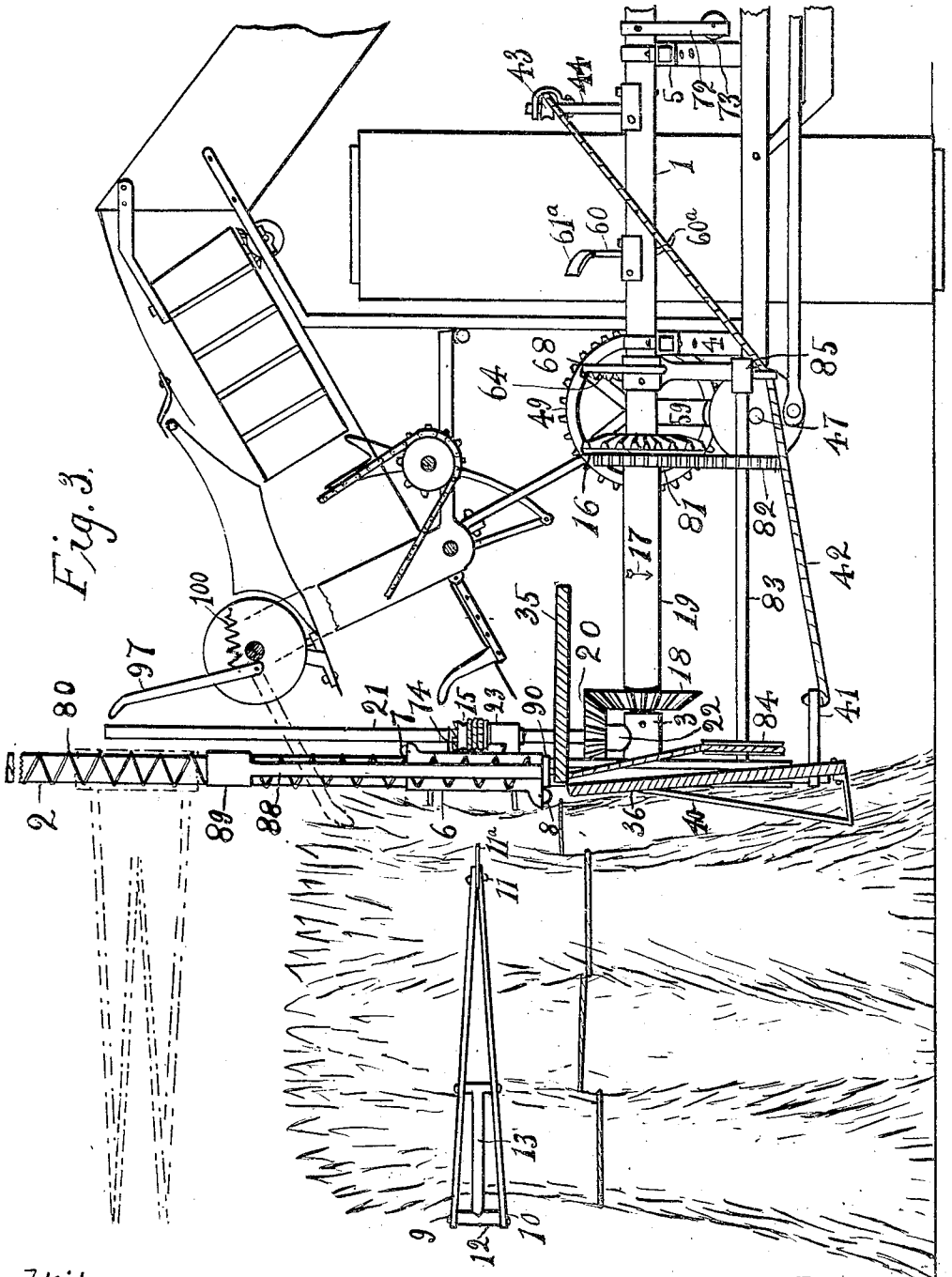
5 SHEETS—SHEET 3.

Fig. 3.



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5 SHEETS—SHEET 4.

Fig. 4.

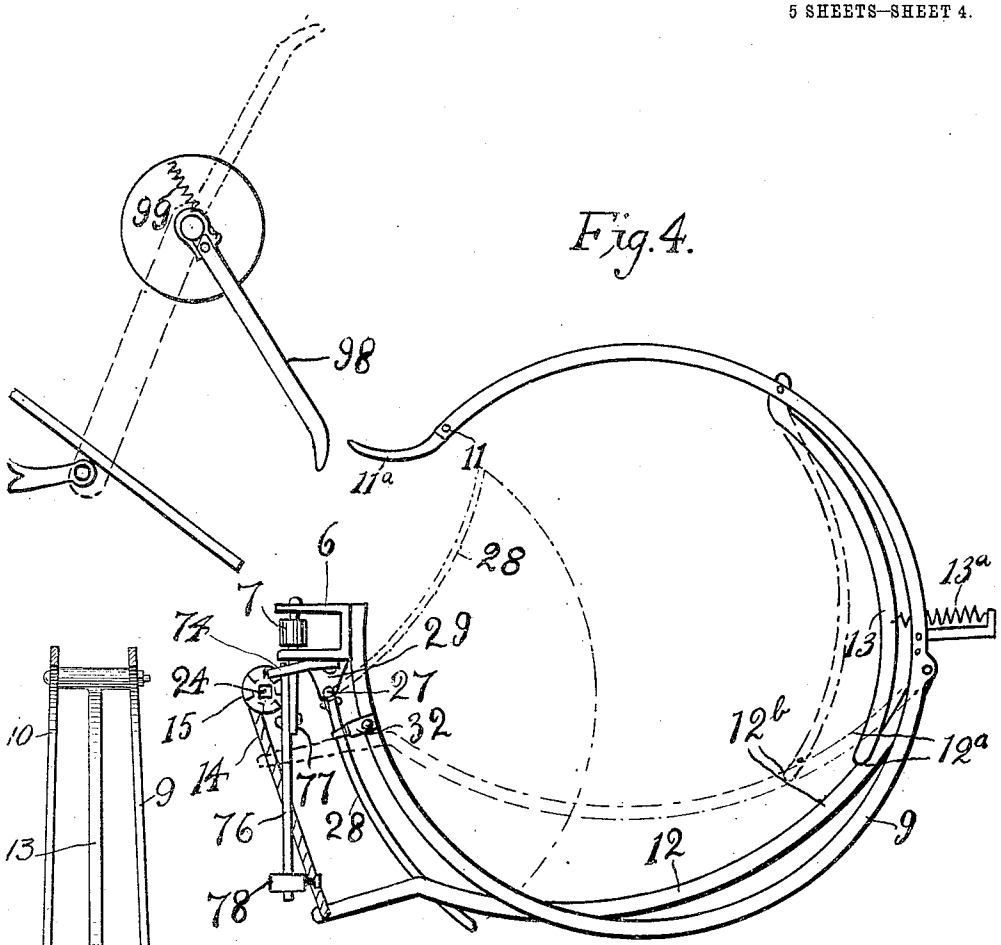


Fig. 10.

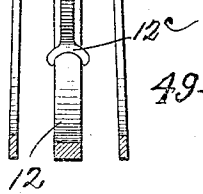
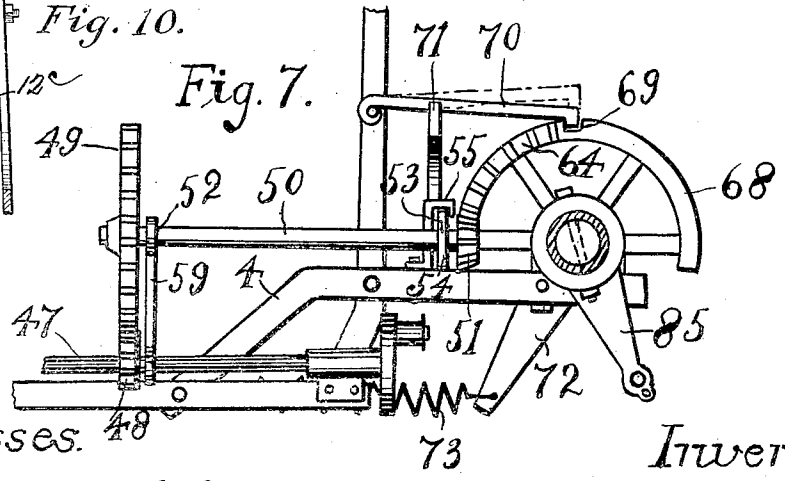


Fig. 7.



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5 SHEETS—SHEET 5.

Fig. 5.

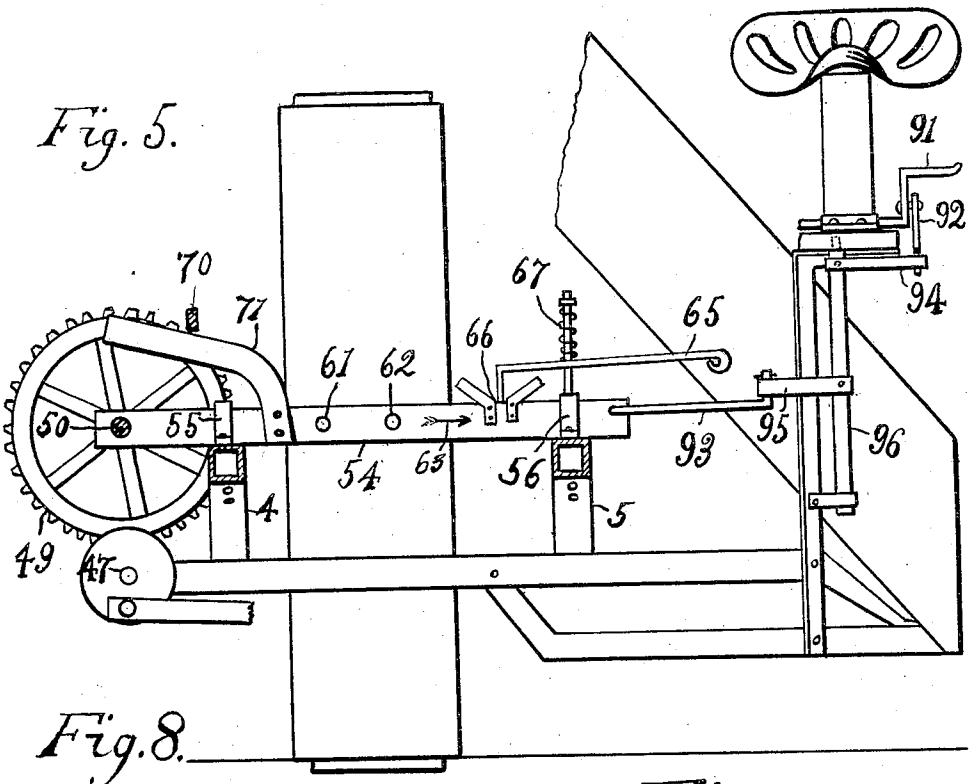


Fig. 8.

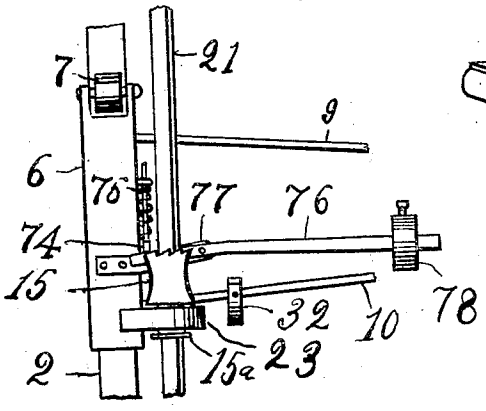
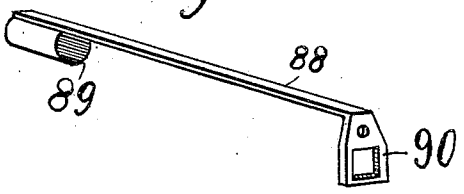


Fig. 9.



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UNITED STATES PATENT OFFICE.

EMIL STUMPF, OF WATERLOO, ILLINOIS.

SHOCKING-MACHINE.

1,041,898. Specification of Letters Patent. Patented Oct. 22, 1912.

Application filed February 20, 1908. Serial No. 416,382.

To all whom it may concern:

Be it known that I, EMIL STUMPF, a citizen of the United States, residing at Waterloo, in the county of Monroe and State of Illinois, have invented a new and useful Shocking-Machine, of which the following is a specification.

My invention relates to harvesters, and particularly to shocking attachments for grain-binders.

The objects of my invention are, first, to receive the bundles from the binder-deck in their horizontal position; second, to compress the bundles after enough have accumulated in the receptacle; third, to tilt the shock over at its butt; fourth, to drop the shock to the ground while it is still held compressed in the receptacle by the compressor-arms; fifth, to release the compressor-arms; sixth, to raise the receptacle up to a place so that it will pass over the shock as the machine advances; and, seventh, to tilt the shocker back to its normal position to receive bundles for the next shock.

With these and other objects in view it consists in the construction and arrangements of parts hereinafter fully described and claimed.

Referring to the drawings, Figure 1 is a top plan view of the shocker and so much of the harvesting-machine as is necessary to show the relation of the shocker thereto, the parts being in position to receive bundles. Fig. 2 is a side elevation of the shocker in position to receive bundles. Fig. 3 is a front elevation showing the shock deposited on the ground and the butt-board folded and swung to the side. Fig. 4 is a rear elevation of the receptacle, looking in the direction of the arrow 4^a in Fig. 1, showing its relation to the side of the binder in position to receive bundles. Fig. 5 is a detail section on the line 5 5 Fig. 1. Fig. 6 is a plan of the butt-board looking in the direction of the arrow 6^a Fig. 1, the dotted lines indicate position when folded and swung to the side. Fig. 7 is a detail section on the line 7 7 Fig. 1 as the shocker is in its vertical position, showing one bracket for pivotally mounting the shocker. Fig. 8 is a detail view of the roller-mounted sleeve carrying the receptacle as viewed from the opposite side to that of Fig. 2 and looking in the direction of the arrow 8^a in Fig. 1. Fig. 9 is a perspective view of the spring guide, also shown in Figs. 1, 2 and 3. Fig. 10 is a detail view showing the sliding connections between the arms 12 and 13.

Throughout the drawings and specification the same numerals of reference denote like parts.

Referring more particularly to the parts, the numeral 1, a round tube, and 2 a square tube, represent the main frame of the shocker. They are securely fastened together by the casting 3 forming a right angle or an L-shaped frame.

4 and 5 are brackets secured to the main frame of the binder for pivotally supporting the L-shaped frame by the round tube 1. The square tube 2 being parallel to the lower edge of the binder-deck.

6 is a sleeve having rollers 7 and 8 one journaled at each end so that when the shocker is in its vertical or discharging position, the weight of the shock is transmitted through these rollers to the tube 2 and the friction reduced so that the shock comes to the ground with force.

9 and 10 represent the receptacle-arms secured to 6. They form almost a complete circle having an opening wide enough for the bundles to pass through from the binder-deck. There is a guide 11^a secured to the receptacle at 11 to guide the bundles into the receptacle.

12 and 13 are the compressor-arms hinged to the receptacle, one presses from below and the other from the side. The arm 12 is pulled up by the rope 14 and the arm 13 is forced inwardly by the upward motion of 12 as shown in Fig. 4. The arm 13 has a groove 12^c at its lower end with which it comes in contact with the arm 12 and slides on said arm 12 from 12^a to 12^b when compressing the shock.

13^a is a spring pulling on the arm 13 to keep the rope 14 in tension when the shocker receives bundles.

Gear-wheel 16 receives the rotating motion from the sickle-driving shaft of the binder by means hereinafter described. The

motion is transmitted to the gear 18 by the tubular shaft 19 on which the gear-wheels 16 and 18 are mounted. It rotates in the direction of the arrow 17. The gear 18 meshes into the bevel pinion 20 and rotates the square shaft 21 which is journaled at 22 in the castings 3 and with the sleeved journal 15ª of the drum 15 in the bracket 23. The bracket 23 is a part of the sleeve 6. The drum 15 has a square hole 24, as shown in Fig. 4, through the center thereof in which the square shaft 21 is held loosely. As the roller-mounted sleeve 6 runs up and down on tube 2 the drum 15 slides with it on the shaft 21.

The fingers 25, 26, and 28 fastened to the shaft 27 form a cradle on which the first bundles of every shock fall and are laid together slowly into the receptacle. A torsion spring 30, shown in Fig. 2, turns the shaft 27 so that the fingers project upwardly as shown in Fig. 4 by the dotted lines. After a few bundles have accumulated the cradle is forced under the receptacle. The shaft 27 is pivotally secured to tube 2 at 29 29. The finger 28 is hinged to the shaft 27 so that it yields perpendicularly to the motion of the cradle. The lug 32 secured to the receptacle arm 10 catches behind the finger 28 while the shock is being deposited on the ground and turns the finger down, as indicated by the dotted lines in Fig. 2, so that it will not come in contact with the arm 12. When the receptacle is in its place again the finger 28 is forced back by a spring 34.

A butt-board 35 and 36 is pivotally secured to the front end of the tube 2. 35 is secured to the shaft 37 and 36 hinged to 35. The shaft's bearings are 38 38. An arm 40 is secured to the lower edge of the butt-board to hold the butts of the bundles from passing below it.

41 is a crank secured to shaft 37. A rope 42 is fastened to 41 passes around the roller 43 on the arm 44 and fastened with the other end to the binder-frame at 45.

44 is an arm secured to tube 1 of the main frame and gives the butt-board the swinging motion on tilting the shock. When the shocker is in position to receive bundles there is a little slack in the rope between 43 and 45, and when it is nearly in its vertical position the slack is then taken up by the forward motion of the arm 44, and then the crank 41 is oscillated which swings the butt-board from under the shock. The folding part 36 folds, when the shock is nearly in its vertical position, by its own gravity. A torsion spring 46, shown in Fig. 2, forces the butt-board back when the shocker is reversed and 36 will take its normal position by its own gravity.

47 is the sickle-driver shaft of the binder. A pinion 48 is mounted thereon as shown in Fig. 7. A cogwheel 49 meshes into it and is mounted on shaft 50 on which also is mounted the bevel pinion 51. 51 meshes intermittently into the gear-wheel 16 and sector-gear 64. The shaft 50 has its bearings at 52 and 53. The bearing 53 is in the gear-shifting bar 54 which reciprocates in the slots 55 and 56 secured to the brackets 4 and 5. The bearing 52 is secured to the shifting-bar 54 by braces 57 and 58 as shown in Fig. 1. The gears 48 and 49 are held in mesh by a bar 59 having eyes for the shafts 47 and 50 shown in Figs. 3 and 7.

60 is a two-way, auger-like, gear-shifter or disengager.

61 and 62 are rollers rotatably secured to the shifting-bar 54. When the shocker is in its discharging position the wing 60ª of the shifter 60 comes in contact with the roller 62 and shifts the bar in the direction of the arrow 63. By this means the gears 16 and 51 are thrown out of engagement. The pinion 51 is then held in the middle between the gear 16 and sector 64 by the detent lever 65 pressing into the beveled notch 66 by the spring 67. When the shocker is to be reversed to its horizontal position, the pinion 51 is meshed into the sector gear 64 by the operator of the binder with a foot-lever connected to the bar 54 by links and cranks. When the shocker is about in its horizontal position the wing 61ª of the shifter 60 comes in contact with the roller 61 and throws the shifting-bar 54 in the opposite direction of the arrow 63 so that the pinion 51 is again held in the middle between the gears 16 and 64 by the lever 65, pressing into the notch 66.

The sector-gear 64 has a flange 68 and a notch 69 in which the lock-lever 70 catches when the shocker is in its vertical position and holds it so as shown in Fig. 7. When the shocker is reversed the lock-lever 70 is raised out of the notch 69 by a curved arm 71, securely fastened to the shifting-bar 54, as it is shifted in the direction of the arrow 63 by the operator. When the shocker is in its horizontal position the arm 71 is shifted with the shifting-bar back again by the shifter 60 and the lock-lever 70 rests on the flange 68. By this means the lock-lever is held in line and, when the shocker is tilted to its vertical position, it will automatically drop into the notch 69.

A crank 72 is secured to the tube 1 of the main frame. A coil spring 73, fast with one end to the crank 72 and with the other end to the binder frame, counterbalances the rear weight of the shocker.

The drum 15 has a ratchet combined with it. A pawl 74, pressed against the ratchet by a spring 75, holds the drum from unwinding until it is forced from the ratchet by the lever 76. The lever 76 has its fulcrum at 77 and has a weight 78 at one end. When

the shock is deposited on the ground the weight 78 on lever 76 forces the pawl 74 from the ratchet and the drum unwinds.

For raising the receptacle up so that it will pass over the shock as the machine advances, a coil spring 80 is provided. The spring is expanded to the butt-board or bottom while the bundles in the receptacle are being compressed. The cogwheel 81 is mounted on the tubular shaft 19 and meshes into the cogwheel 82 mounted on the shaft 83. A drum 84 is mounted on the shaft 83 near the tube 2. The shaft is journaled at 85 and 86. The bearing 85 is secured to the sector-gear 64 as shown particularly in Fig. 7. A rope 87 is secured with one end to the drum 84 and with the other to the spring 80. A spring guide 88 is provided to guide the spring 80 straight down the tube 2. It is shown in perspective view Fig. 9.

89 is a ring which surrounds the spring 80 to hold the guide in line with the tube 2. At its other end 90, is a square slot by which it slides down the tube 2 and when pulled up by the spring 80 it raises the receptacle.

The operator can put the shocker into operation at his will by pressing on the foot-lever 91, shown in Fig. 5, and through the links 92 and 93, cranks 94 and 95 on shaft 96, shifts the shifting-bar 54.

The discharging arms 97 and 98 of the binder are turned up to their vertical positions by the springs 99 and 100 after each bundle is discharged from the binder-deck so that the shaft 21, when the shocker is tilted, will not touch them.

101 is a brace for supporting the rear weight of the shocker in its horizontal position.

102 is a square collar shown in Fig. 2 with a setscrew for adjusting the receptacle for tall and short grain. The spring 80 pulls the sleeve 6 against this collar.

The operation of the shocker, the construction of which has now been fully described, is as follows: First the shocker is in receiving or horizontal position with the cradle fingers, 25, 26 and 28 projecting upwardly which hold the first bundles, discharged from the binder-deck, from falling into the receptacle. After a few bundles have accumulated on the cradle, their weight causes the cradle to turn under the receptacle and the bundles lie on the bar 40 at the butt-board and arms 9 and 10 of the receptacle. The rest of the bundles fall into the receptacle from the binder-deck. After the receptacle has been filled the operator presses on the foot-lever 91 and engages the pinion 51 with the gear wheel 16. The pinion 51 is a continuously rotating pinion. Then the drum 15 winds up the rope 14 and oscillates the compressor-arms 12 and 13 and compresses the bundles. While the bundles are being compressed, spring 80 is expanded. After the bundles in the receptacle are compressed, and rope 14 can not be wound up more, the drum 15 and pinion 20 stop rotating. As the pinion 20 stops rotating, and the bevel gear 18 still rotates the shocker with the shock is tilted to a vertical position. While the shocker is thus being tilted, the butt-board folds and is swung forward, the shifter 60 disengages the pinion 51 from the gear 16, and the lever 70 drops into the notch 69 of the sector 64 to hold the shocker vertically. When the shocker is in its vertical position the shock drops to the ground with the receptacle and forces the butts through the stubble, the shock being held tight by the receptacle. As the shock hits the ground it causes the weight 78 to force the pawl 74 from the ratchet on drum 15. This pawl and ratchet on drum 15 holds both drums, 15 and 84, from unwinding except when disengaged. Both drums are unwound by the contraction of spring 80 which reverses gears 18 and 20, and the drum 15, and raises the receptacle so that it will pass over the shock as the machine advances. When the machine has passed the shock just deposited the operator reverses the shocker by engaging the pinion 51 with sector 64 by the foot lever 91. When the shocker is about in its horizontal position the shifter 60 disengages the pinion 51 from the sector 64. The buttboard is swung back to its normal position by the spring 46.

Having thus described the invention, what is claimed is—

1. In combination with a binder frame, a shocker frame consisting of a round tube, a square tube, and a casting by which they are rigidly secured together at the end of each, forming an L-shaped frame, and said round tube being rotatably supported to the front part of the binder frame, substantially as described.

2. In a shocking attachment for grain-binders, a receptacle of curved rods, each forming almost a complete circle, and having an opening wide enough for bundles to pass through from the binder-deck, two compressing arms pivoted in the receptacle so that one compresses from below and the other from the side, and a spring pulling on the side-compressor arm, substantially as described.

3. In combination with a grain binder, a shocker comprising an L-shaped frame pivoted to the front part of the binder, a receptacle and a butt-board carried by said L-shaped frame, a shaft supported on the L-shaped frame and having fingers projecting therefrom to form a cradle, one of said fingers extending between the receptacle and butt board and being pivoted to the shaft, and means for turning said finger down-

wardly on depositing the shock, substantially as described.

4. In combination with a grain binder, an L-shaped shocker frame having one member rotatably supported by the binder, a shocker mounted on the other member, a tubular shaft sleeved on the shocker frame, gears 16 and 18 secured to said tubular shaft, connections between the gear 18 and the shocker, a shaft 50, means for transmitting motion from the binder to said shaft, a pinion 51 secured to the shaft, a sector 64 secured to the shocker frame, means for engaging the pinion with the gear 16 for rotating the shocker to discharge position and with the sector 64 for rotating the shocker back to receiving position, means for disengaging the pinion from the gear 16 when the shocker is in its discharging position and from the sector 64 when in its receiving position, and means for holding the shocker in its discharging position when said gear 16 and pinion 51 are disengaged, substantially as described.

5. In combination with a grain binder, a binder deck, a shocker, an L-shaped frame being the main frame of the shocker and rotatably mounted by one member to the binder, a square sleeve reciprocatingly mounted on the other member which is also square and normally disposed in a horizontal position longitudinally of the binder deck a receptacle secured to said sleeve and being held thereby in receiving position adjacent to the binder deck, a pair of rollers rotatably mounted on opposite sides in the sleeve in such a manner as to reduce friction on the shocker frame while reciprocating thereon, and means for rotating the square member of the frame to a substantially vertical position to deposit the shock, said sleeve being moved downward by gravity on the square member during the rotation of the latter.

6. In combination with a grain binder, an L-shaped frame consisting of a square shaft and a round shaft, the round shaft being supported transversely on the binder for rotation about its own longitudinal axis and the square shaft extending longitudinally and normally in a horizontal position at the stubbleward side of the binder, a sleeve mounted for reciprocation on the square shaft, a shock receptacle attached to said sleeve, compression arms pivoted in the receptacle, a drum rotatably mounted on the sleeve, connections between the drum and the compression arms, a shaft slidably mounted in the drum and revolubly mounted in the shocker frame, a tubular sleeve rotatably mounted on the aforesaid round shaft, gear connections between said tubular sleeve and the shaft mounted in the drum, means for rotating the tubular sleeve, the rotation of the sleeve resulting first in winding up the drum to tighten the compression arms on the sheaves and then in tilting the square shaft to discharge the shock, means for holding the drum in its wound up position, and means for releasing said holding means when the shock strikes the ground.

7. In combination with a grain binder, a shocker, brackets 4 and 5 secured to the front part of the binder frame, a shocker frame rotatably supported by said brackets, a bar 54 slidably mounted on the brackets, a shaft 50, bearings on the bar for supporting said shaft, means for transmitting motion from the binder to the shaft 50, a tubular shaft sleeved on the shocker frame, connections between the tubular shaft and the shocker, a gear 16 secured to said tubular shaft, a sector secured to the shocker frame, a pinion 51 connected to the shaft 50, rollers 61 and 62 rotatably secured to the bar, a shifter connected to the shocker frame engaging with said rollers thereby shifting the bar for disengaging the pinion 51 from the gear 16 when the shocker is in its discharging position and from the sector when the shocker is in its receiving position, a beveled notch on the bar, a lever pressing into said notch for temporarily holding the pinion 51 in the middle between the gear 16 and the sector, and manually operable means for shifting the pinion 51 into engagement with the gear 16 when the shocker is in its receiving position to raise it to discharge position and with the sector when the shocker is in its discharging position to return it to receiving position, substantially as described.

8. In combination with a shocker, a folding butt-board pivoted to the front part of the shocker, a bar along the lower edge thereof at the rear and spaced therefrom, and means for swinging the butt-board from the shock when the shocker is nearly in its vertical position, substantially as described.

9. In combination with a grain binder, an L-shaped shocker frame consisting of a round shaft by which it is supported longitudinally to the fore part of the binder and a square shaft normally disposed in a horizontal position along the stubbleward side of the binder, a square sleeve slidably mounted on the square shaft of the shocker frame, a receptacle fixed on said sleeve and a drum rotatably mounted on said sleeve, compression arms pivotally mounted in the receptacle, connection between the compression arms and the drum, a tubular sleeve rotatably mounted on the round shaft of the shocker frame, means for transmitting motion from the tubular sleeve to the drum, a spring guide 88 slidably mounted on the square shaft of the shocker frame, a spring 80 having one end secured to the rear end

of the square shaft of the shocker frame and having the other end secured to said spring guide, connections between the spring guide and the tubular sleeve, means for rotating the tubular sleeve to actuate the compressor arms, to extend the spring 80, and to tilt the shock receptacle to discharge the shock, and means for releasing the compression arms and the extended spring 80 when the shock strikes the ground, the receptacle being restored by the spring to its normal position.

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