

(No Model.)

2 Sheets—Sheet 1.

D. A. GREENE.
KINDLING WOOD BUNDLER.

No. 562,722.

Patented June 23, 1896.

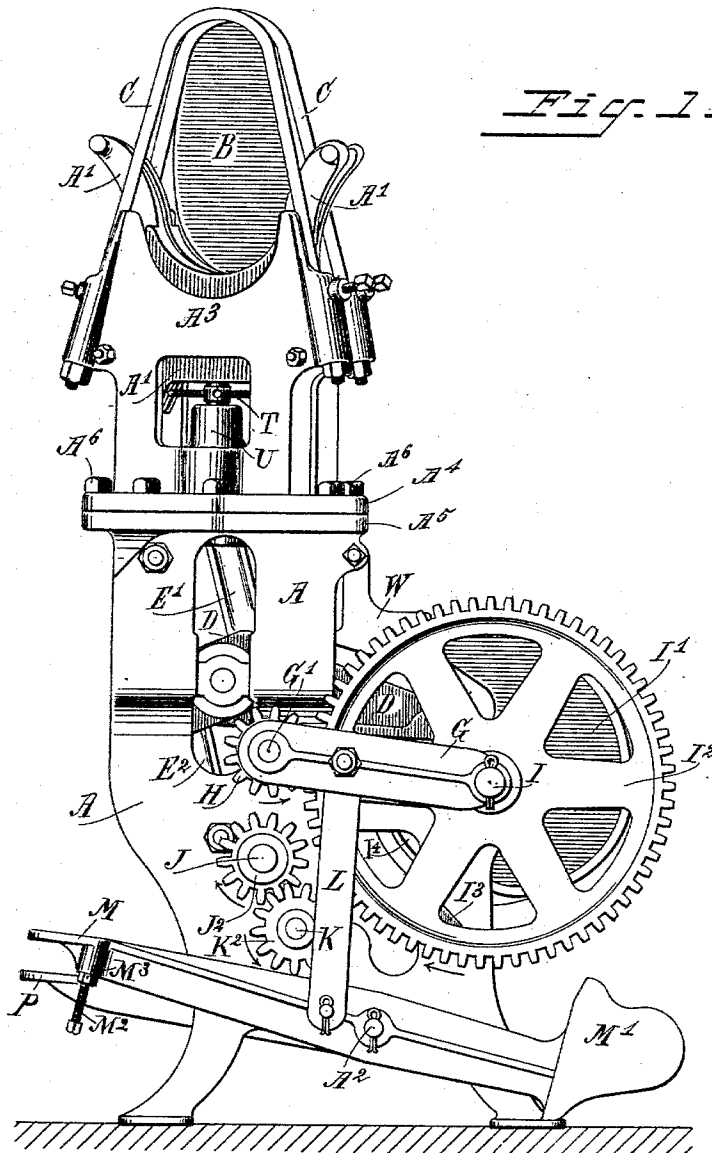


Fig. 1.

WITNESSES:

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H. F. Boyle.

INVENTOR:

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James D. Stetson

ATTORNEY.

(No Model.)

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Fig. 3.

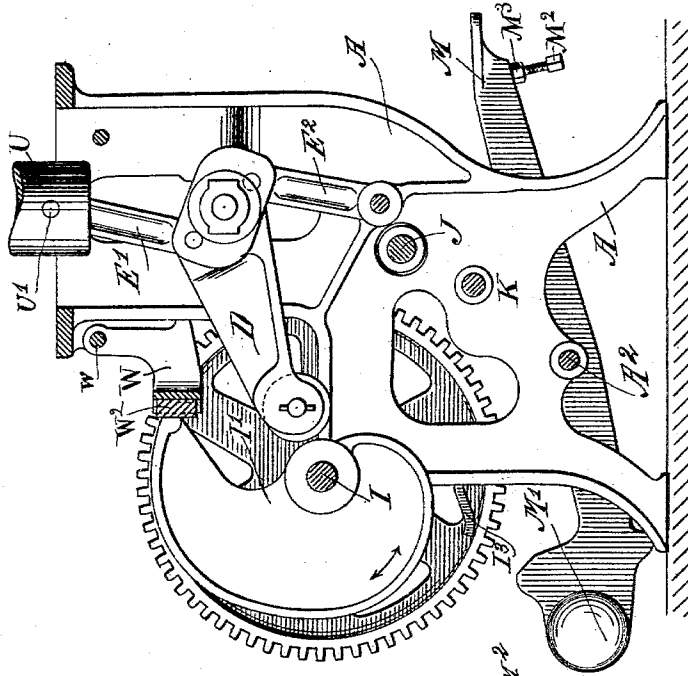
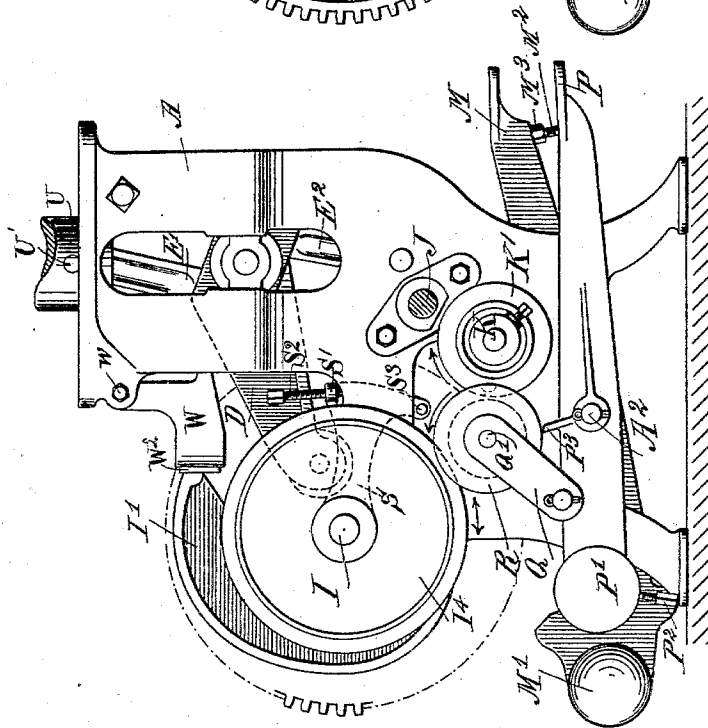


Fig. 2.



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UNITED STATES PATENT OFFICE.

DARWIN A. GREENE, OF BROOKLYN, NEW YORK.

KINDLING-WOOD BUNDLER.

SPECIFICATION forming part of Letters Patent No. 562,722, dated June 23, 1896.

Application filed October 5, 1895. Serial No. 564,729. (No model.)

To all whom it may concern:

Be it known that I, DARWIN A. GREENE, a citizen of the United States, residing in Brooklyn, Kings county, in the State of New York, have invented a certain new and useful Improvement in Kindling-Wood Bundlers, of which the following is a specification.

I employ the ordinary construction of the parts which act on the wood, as set forth in the patent to me dated February 26, 1884, No. 294,125. The invention relates to the means for operating those parts. I operate by a cam or wiper carried on a revolving shaft, with mechanism for revolving such shaft alternately in opposite directions to open and close the compressor while the driving-shaft rotates continuously and uniformly in one direction. In my machine set forth in the said patent the compressing is effected by the force of the hand or foot of the operator. I have in my patent dated March 16, 1886, No. 337,946, shown a steam-cylinder attached directly to each bundler, with connections for supplying steam and properly distributing it to operate the parts. By my present invention these cylinders and attachments are dispensed with and the power is received from a line-shaft turned continuously in one direction by a steam-engine or other suitable source, and by ordinary means, as a belt, communicating a continuous rotary motion to a shaft in my machine, which has an approximately volute cam or wiper, the turning of which in one direction closes the parts and compresses the bundle, and the turning of which in the opposite direction opens the parts and releases the bundle. I provide means, controllable at will, for turning such shaft alternately in opposite directions. The compressing mechanism is thrown out of engagement automatically when the proper degree of compression is attained.

The machine avoids the expense of constructing and maintaining so many steam-cylinders, valves, &c., and avoids the heat incident to the use of steam-cylinders in such close relation.

The accompanying drawings form a part of this specification and represent what I consider the best means of carrying out the invention.

Figure 1 is a side elevation showing the en-

tire machine. Fig. 2 shows the main portion of the machine, seen from the other side. Fig. 3 is a corresponding elevation with the friction-gear and a portion of the frame removed.

All the figures show the machine in its idle condition, ready to receive the wood which is to be compressed.

Similar letters of reference indicate corresponding parts in all the figures where they appear.

A is the fixed framework.

B B is the back plate, which gages the endwise position of the short pieces of wood being bundled, and A' is the cradle, a stout casting properly formed to shape the lower side of the bundle, and adapted to rise and sink to effect the compression and release of the wood.

C C are straps, shown as double, but which may serve successfully single, adapted to match to the upper side of the bundle and to hold it against being lifted under the strain received from below.

D is the operating-lever, and E' E² the toggle-links actuated thereby to forcibly lift the cradle at each operation. The motions are controlled by two foot-levers or treadles, which are to be depressed alternately.

The lever D controls the compressing motion. It is equipped with an antifriction-roller, which is acted on by an approximately volute cam or wiper I', fixed on a shaft I. The operation of the toggles is effected by making a nearly-complete revolution of the shaft I alternately in one direction and the other. When the motion in either direction has progressed to a certain point, it is automatically arrested, and the machine is left in that condition until the workman depresses the other foot-lever and thereby initiates the motion in the opposite direction.

J is a shaft turned by the action of a belt on a pulley. (Not shown.) This gives a constant and sufficiently strong rotation to a small gear-wheel J².

The revolving of the shaft I and the attached wiper I' in the direction to compress the wood is effected by spur-gear, through the aid of the large gear-wheel I², which is acted on at the proper time by a small gear-wheel H, which turns loosely on a stud G', carried

on a lever G, which latter is capable of being turned on the shaft I as a center. The wheel H is constantly in gear with the wheel I² and is thrown into and out of gear with the driving-wheel J², as required. The lever G is depressed at the required times by the action of a link L, which connects to the foot-lever M, turning on a fixed stud A', and which is actuated by the foot of the attendant. The opposite end of the foot-lever M carries a counterweight M', which is sufficient to promptly turn the foot-lever in the direction to lift the link L and its attachments and thereby carry the gear-wheel H out of engagement with the driving gear-wheel J². When the operator depresses the foot-lever M and raises the weight M', it brings the gear-wheel H into engagement with the driving gear-wheel J², and the wiper I' is revolved in the direction to raise the lever D and straighten the toggles E' E², thereby raising the cradle A' and compressing the wood. When this operation has proceeded to a sufficient extent, a dog I³ on the inner face of the wheel I² touches a properly-rounded part near the upper surface of the weight M' and depresses it forcibly, thereby compelling the lifting of the foot-lever M and disengaging the gear-wheel H from the driving-wheel J², and the motion of the cam I stops. The machine may remain in this condition for any period, holding the wood tightly compressed. During this period the string or other confining means, as a wire, is properly secured around the compressed bundle.

The direction of the force received by the movable wheel H from the constantly-revolving wheel J² when it is lowered into engagement therewith and the direction of the force given out again to the large gear-wheel I² tend to draw the gear-wheel H too deeply into engagement with the teeth of each of these wheels. The tendency to bottom the gear-teeth in the large wheel I² is well resisted by the lever G, which, while it is free to rise and sink, is obviously rigid to resist endwise compression.

I provide special means for resisting the tendency of the wheel H to crowd down and bottom the teeth in the gear-wheel J², and I make such means adjustable. These consist in the screw M², tapped into the foot-lever M and extending downward therefrom, held firmly in any position in which it may be adjusted by aid of a jam-nut M³. The head of this screw M² serves as the stop by striking a fixed object below and arresting the further descent when the lever M has been depressed to a proper extent by the action of the foot of the attendant. As shown, this screw will strike the floor, but it may be preferable to arrange it to strike the iron foot of the machine. When for any reason it is desired to allow the foot-lever to sink a little lower and the teeth of the wheels to engage deeper, the nut M³ is slackened, the screw M² adjusted higher in the foot-lever M, and the

nut M³ again tightened. The compression is relaxed by turning the shaft I and its attached wiper I' in the opposite direction. This is controlled by a foot-lever or treadle P, turning on a fixed center and carrying a link Q, which bears on a stud Q' a smooth friction-wheel R.

K' (see Fig. 2) is a constantly-turning friction gear-wheel carried on a shaft K. It receives motion from the shaft J through the gears J² K², (see Fig. 1,) and consequently revolves in the opposite direction to J. The smooth friction-pulley K' serves to impart, through its continuous rotation, a partial rotation to the cam-shaft I in the opposite direction when it is required to relax the compression and to receive the wood for another bundle.

The peripheries of the several friction-wheels are preferably grooved and ridged. The depression of the foot-lever P presses the smooth wheel R into frictional engagement with the wheels K' and I⁴, so that the motion is communicated frictionally to the shaft I, turning it in the direction to permit the lowering of the lever D and deflection of the toggles E' E², and the lowering of the cradle A' to release the bundle.

The cam or wiper I' has a concentric surface at its highest point, so that the roller is carried thereon without any disposition to turn the shaft in either direction.

When the operator depresses the foot-lever P and brings the friction-gearing into action, it turns the shaft I, with its attached wiper I', in the backward direction, this motion being not only without obstruction, but aided by the expansion of the wood, which acts on the volute surface of the wiper to promote the motion. I provide a stop which arrests the reverse motion at the right point. W is such a stop, faced with wood W², held in a dovetail groove on the working face, so that the blow of the point of the wiper is not against iron, but against wood, and is practically silent. This stop W is capable of turning on an axis w, supported on the frame, and it is raised by the contact of the lever D, so that it offers no obstruction thereto. On the descent of the lever D it falls back into place again.

It will now be understood that if the foot of the attendant is allowed to rest too long on the foot-lever M with the apparent intent to make the wiper I' perform more than one revolution, the cam I³, carried by the shaft I, touches the rounded top of the lever near the counterweight M' and actively depresses it, thus causing the counterweight to serve as a tripping-piece, compelling the lever M to turn and disconnect the gear-wheels H and J². This insures that the wiper shall not revolve beyond the proper extent. When the relaxing motion is completed, the back of the stop W bears fairly against the frame and the stop stiffly resists any further turning of the wiper in that direction.

P² is a screw tapped into the counterweight

P', which lifts the treadle P. This screw P² strikes the foot of the machine. It may be adjusted to regulate the height to which the treadle P will rise.

5 P³ is a spur cast on the upper side of the lever P in the position represented. It receives the friction gear-wheel R and supports it in about the correct position when not in use. This wheel should have freedom to find
10 its bearings equally between the friction gear-wheels K' and I' when the treadle is depressed, and this part of the apparatus is brought into action.

S is a piece of metal (see Fig. 2) centered
15 loosely on the shaft I, alongside of the wiper I' and having a cross-piece S', one end of which carries a screw S², which rests on the framing and holds the piece up strongly. The other end of the cross-piece engages
20 under the lever D and when it descends supports it. The termination of the descent of the lever D and consequently of the cradle A' controls the size of the space provided for the wood. If we want more room for the wood,
25 the screw is turned to let the part S and consequently the lever D and the cradle A' descend lower. A jam-nut holds the screw firmly set. An arm S³ extends laterally from the lower edge of the piece S and engages
30 under a lip on the framing. (Shown in dotted lines in Fig. 2.) This gives all the freedom required for adjustments and prevents the piece S from ever being raised too high and perhaps thrown quite over the shaft I by the
35 friction of such shaft.

The tightness with which the bundle is compressed may be varied by turning a right-and-left screw T, which intervenes between and connects the cradle A', with the cross-head or vertical guide-block U below.

40 The block U, which serves as a cross-head, receives the action of the toggle, the upper member E' of the toggle entering a cavity in its base and being connected by a pivot-bolt
45 U'. (See Figs. 2 and 3.) This block is cast or turned cylindrical, and the slideway in the base of the head in which it reciprocates is correspondingly cylindrical, and of such size as to make an easy fit. The right-and-left
50 screw T connects this block and the cradle A' and serves not only to adjust the height of the cradle relatively to the block and thus to determine the degree of compression of the bundle, but also serves by its central position
55 and its freedom of turning to allow the head and its attachments, including the cradle and strap, to be turned in any required position to accommodate the work.

60 The cylindrical form of the cross-head and the corresponding cylindrical hole in which it turns are among the easiest forms to produce, requiring simply turning and boring. This form of cross-head and bearing therefor allows the parts to adjust themselves and to
65 automatically maintain an easy and durable bearing. They make an easy fit. However, the head A³ and the cradle A' and its connec-

tions may be partially revolved, so as to stand in various positions, saving expense and trouble in adjusting the moving parts of the machine. It is desirable sometimes to thus turn
70 the head of the framing and its contents so as to hold the parts in a different position. The head A³ is made in a separate piece from the main body A and is secured thereto by
75 flanges A⁴ A⁵ and bolts A⁶. There may be eight of these bolts, equally spaced, and by taking them out and turning the head and replacing them, the head may stand in eight different positions. By increasing the number
80 of equally-spaced bolt-holes and bolts the adjustment may be made still finer. It will be understood that with each such change of position of the head-flange A³ there will be a
85 corresponding change of position of the cradle A' and strap C. This condition also allows a complete change of the head when such becomes desirable for any reason, taking away
90 the present head with its contents and substituting another, which may be merely one less worn, or one of a different size or form. It is important that the flanges and bolts shall match and that the cradle and other parts shall properly connect to the operating mechanism below.

95 Modifications may be made without departing from the principle or sacrificing the advantages of the invention. I can use anti-friction-gear for lifting the cradle, or toothed gear for depressing it. I prefer the spur-gear
100 for the closing of the compressor, for the reason, among others, that such gear gives great force in the rotation induced, while requiring but little pressure to effect the engagement; and I prefer the friction-gear to effect
105 the lowering of the cradle, for the reason among others that if by any mistake both foot-levers should be depressed at once no mischief would be induced, the friction-gear yielding to the imperious requirements of the
110 spur-gear.

An efficient guard should be used to shield the gearing from being injured by wood dropping accidentally into it.

I claim as my invention—

115 1. In a wood-bundler the wiper I', in combination with connections D, E', E², for operating a compressor thereby, and with two sets of mechanism, one set adapted to rotate such wiper in one direction and thus to close the
120 compressor, and the other set to rotate the wiper in the opposite direction and open the compressor, all substantially as herein specified.

125 2. In a wood-bundler, the cam or wiper I', in combination with two sets of mechanism, one set comprising the gear-wheel H, adapted to partially rotate to close the compressor, and the other set, comprising the gear-wheel
130 K² and friction-wheel K', adapted to partially rotate to open the compressor, and with the cam I³ carried on the shaft I of the wiper, and tripping-piece M' and controlling-lever M carrying such piece, arranged substantially as

shown, so that, when the compression has reached a certain stage, the mechanism will be unclutched, all substantially as herein specified.

5 3. In a wood-bundler, the wiper I' adapted by rotating alternately in opposite directions to raise and lower the cradle A', in combination with the gear-wheels I² and J², revolving in fixed bearings, and the movable gear-wheel
10 II and means for moving it, adapted to connect them at will, and with the adjustable stop M² for resisting the bottoming of the gearing, and means for rotating the wiper in the opposite direction when required to lower
15 the cradle, all arranged for joint operation substantially as herein specified.

4. In a wood-bundler, the wiper I', adapted by rotating alternately in opposite directions to close and open the compressor, in combination with spur-gear for turning such wiper
20 in the proper direction to raise the cradle and induce the compressing, and with friction-gear for turning it in the opposite direction to serve as the liberating mechanism, all arranged for joint operation substantially as
25 herein specified.

5. In a machine for bundling wood having a wiper I' with provisions for turning it in opposite directions at will, the movable stop
30 W, in combination with such wiper and with the operating-lever D, arranged to yield to allow the rise of the said lever and thus to accommodate the forward movements of the cam, and to resist the backward motion thereof, beyond a certain extent, all arranged for
35 joint operation substantially as herein specified.

6. In a kindling-wood bundler, the combination with the wiper I' and means for par-

tially turning it, and the cradle A' raised and lowered thereby of the fixed strap or abutment C lever D, stop S, cross-piece S', and gage-screw S² with means for turning and confining it as required, adapted to adjust the extent to which the cradle is lowered at each
45 opening movement, all arranged for joint operation substantially as herein specified.

7. In a kindling-wood bundler the head A³ carrying the strap C and detachably and changeably connected by the bolts A⁶ fitted
50 in equally-spaced holes in the flanges A⁴, A⁵ to the main frame A, and adapted to be turned into various positions thereon, arranged to serve therewith and with the cradle A' and operating mechanism as the toggles E', E²,
55 and lever D and the right-and-left screw T, for raising and lowering the cradle and also allowing it to turn, all arranged for joint operation substantially as herein specified.

8. In a wood-bundler, in combination with the cradle A', and means for powerfully raising and lowering it, the head A³ having a cylindrical slideway, and the corresponding cylindrical block or cross-head U, rising and
60 sinking therein, and a right-and-left screw T adapted to perform the double function of adjusting the height of the cradle and of serving as a pivot to allow the cradle to be
65 turned with the head at various angles, all arranged for joint operation substantially as herein specified.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

DARWIN A. GREENE.

Witnesses:

J. B. CLAUTICE,
M. F. BOYLE.