(No Model.)

A. WICKEY.

BALING PRESS.

No. 370,170. Patented Sept. 20, 1887.

Fig. 1.

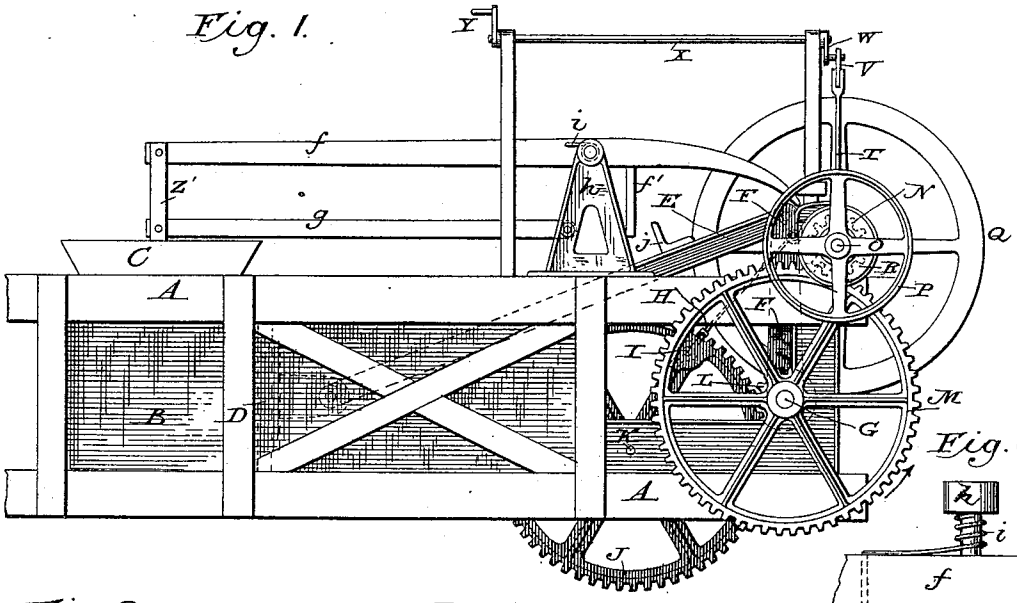


Fig. 6

Fig. 2.

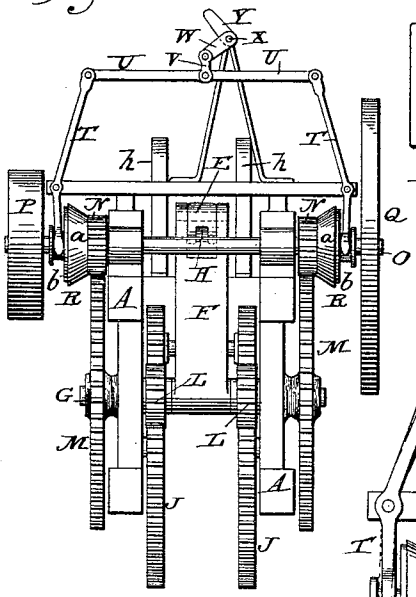


Fig. 3.

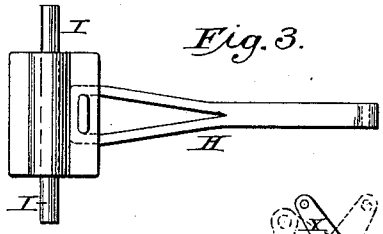


Fig. 5.

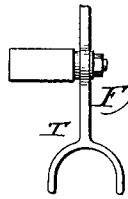


Fig. 4.

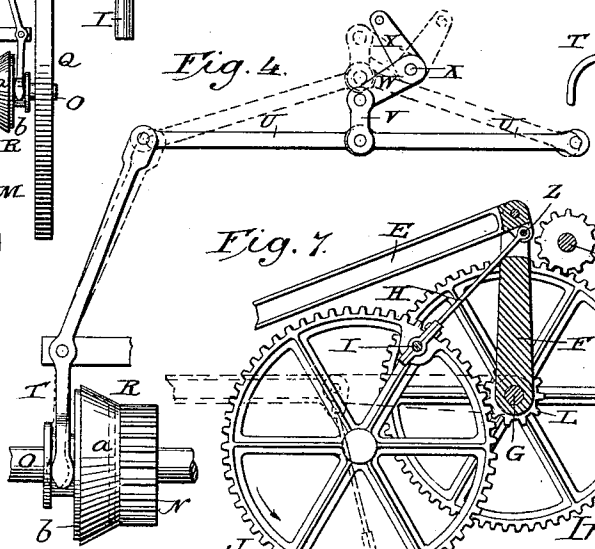


Fig. 7.

Attest.

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UNITED STATES PATENT OFFICE.

ANDREW WICKEY, OF QUINCY, ILLINOIS.

BALING-PRESS.

SPECIFICATION forming part of Letters Patent No. 370,170, dated September 20, 1887.

Application filed October 18, 1886. Serial No. 216,555. (No model.)

To all whom it may concern:

Be it known that I, ANDREW WICKEY, of Quincy, in the county of Adams and State of Illinois, have invented certain Improvements in Baling-Presses, of which the following is a specification.

My invention relates to what are commonly termed "continuous baling-presses," in which the material supplied continuously to a hopper or receiving-chamber is carried forward by a reciprocating plunger through a trunk or passage into which it is compressed, and in which the mass is divided by boards introduced at suitable intervals into bodies of suitable length to form bales, which bodies are finally delivered at the end of the trunk.

The invention relates more particularly to means for preventing the breakage of the mechanism when subjected to successive strains; to improved means for operating the plunger, whereby its forward motion is diminished in speed and the force increased as the density of the material increases; in improved frictional driving mechanism, and in other details, hereinafter explained.

Referring to the accompanying drawings, Figure 1 is a side elevation of a press containing my improvements; Fig. 2, an end elevation of the same, looking from the head. Fig. 3 is a view showing the break-pin by which the parts are relieved from strain. Fig. 4 is an elevation showing the friction-gearing. Fig. 5 is a face view of one of the clutch-operating levers. Fig. 6 is a view of the spring-connection of the feeding-fork. Fig. 7 is a side elevation in outline, showing the mechanism for moving the plunger.

Referring to the drawings, A represents a rigid main frame having at a suitable point in its length a receiving-chamber, B, with a feed mouth or hopper, C, at the top to permit the introduction of the material. Beyond the receiving-chamber B the press will be constructed with the ordinary trunk in which the compression of the material is effected, and with the various appliances such as are commonly used in the art. As these parts have no bearing on my present invention and may be of ordinary construction, it is deemed unnecessary to illustrate them in the accompanying drawings.

In the forward end of the frame I mount, as usual, a reciprocating head or plunger, D, by which the material delivered into the receiving-chamber B is advanced and compressed in the usual manner. As a means of operating this plunger, I attach thereto a pitman, E, jointed at its rear end to an arm, F, which is in turn pivoted to a horizontal shaft, G, seated in fixed bearings. The two members E and F constitute jointly a toggle-joint or lever, which acts as it is straightened to advance the plunger, in a manner which will be understood by every mechanic. For the purpose of operating the toggle-joint I extend a connecting-rod, H, from the rear end of the pitman E to crank-pins I on revolving wheels J. The two wheels J are mounted on fixed studs K on the sides of the frame, in order that the connecting-rod H may pass between them without the interference which would result from a through-shaft, and receive motion in turn from pinions L, fixed on opposite ends of the shaft G, before alluded to. This shaft receives motion through duplicate gear-wheels M, fixed on its opposite ends, from pinion N, turning loosely on the main driving-shaft O, which extends through the machine from side to side, with a driving-pulley, P, or equivalent, on one end, and with a fly-wheel, Q, preferably on the opposite end. The driving-shaft is kept constantly in motion, and communicates motion at the proper times to the gearing by means of two friction-clutches, R, at its opposite ends. These clutches constitute, as shown in the several figures, two hollow or female cones, *a*, fixed to the respective pinions N, and of male cones *b*, splined or otherwise attached to the driving-shaft, whereby they are compelled to rotate therewith, but permitted to play longitudinally. These cones constitute an ordinary friction-clutch familiar to every skilled mechanic. The cones *b* have peripherally-grooved hubs, which are engaged respectively by forked levers T, pivoted to the main frame, and connected each by a link, U, to a third link, V, carried by a crank-arm, W, fixed on a horizontal shaft, X, which is extended through bearings in the main frame and provided at its rear end with an operating handle or lever, Y, located adjacent to the feed-hopper and in position to be conveniently controlled by the attendant while in the position which he ordinarily occupies in feeding the press. By

operating the handle Y the attendant is enabled to throw both clutches into or out of action simultaneously at will, and thus to stop and start the operative mechanism of the press without stopping the motor.

The employment of the friction-clutches is advantageous in that they enable the operator by properly controlling them to stop and start the press gradually, and to relieve the parts in the event of excessive resistance.

In order to prevent the breakage of the press in case of the plunger or other parts being unduly obstructed in their movement, I connect the connecting-rod H to the toggle by means of a pin, Z, of wood, so proportioned as to size and strength that it will give way whenever the strain upon the parts exceeds the safety limit. This pin, which may be quickly and cheaply replaced, constitutes an effective protection against injury to the press.

The wheels which carry the crank or wrist pins I have their shaft K located in advance of the rear end of the toggle and near the point to which the middle of the toggle advances when it is straightened. In consequence of this arrangement, which is clearly shown in Fig. 7, the crank-pins act during more than half of their revolution to effect the advance of the plunger, its retraction being effected during the remaining portion of the revolution. In this manner I am enabled to advance the plunger slowly and with a powerful action, and to effect its speedy retraction.

It will be perceived that, owing to the use of the toggle and to the peculiar relation of the connecting-rod H thereto, the plunger is advanced rapidly during the early part of its movement at the beginning of the compression and while the material offers comparatively a slight resistance, and that the speed decreases and the power applied increases as the material, by reason of its greater compression, offers an increased resistance. These facts all co-operate to render the press more effective and to increase its capacity.

For the purpose of delivering the material through the feed-hopper into the receiving-chamber B, I employ a vertically-reciprocating pusher-bar, Z′, jointed to and carried by the forward ends of two parallel arms, *f* and *g*, jointed near their rear ends to a standard, *h*, on the main frame. These arms serve to maintain the bar in an upright position while permitting it to rise and fall with freedom. The rear end of the upper arm, *f*, is extended beyond its pivot in position to encounter the toggle as the latter acts to retract the plunger. A spring, *i*, applied as shown in Figs. 1 and 6, acts upon the arm *f* to elevate the pusher-bar during the advance of the plunger. As a precautionary matter, I provide the arm *f* with a depending arm, *f′*, in position to encounter a projection, *j*, applied to the pitman E during the advance of the latter. If the spring fails to lift the pusher Z′, the projection *j*, acting on the arm *f′*, lifts the arm *f* and the pusher positively before the plunger advances any considerable distance.

In constructing the press I prefer to mount the bearings of the several shafts in cast-metal frame-plates, one on each side of the machine, bolted securely to the main frame. In practice I find that the mounting of the toggle upon the shaft G of the driving-gear is attended with considerable advantage.

Having thus described my invention, what I claim is—

1. In combination with the plunger and the toggle-joint E F, for operating the same, the connecting-rod H, its operating-crank I, and the break-pin Z, of wood, substantially as described.

2. The plunger and the toggle-joint E F, connected thereto, the crank-pin I, arranged to revolve in a continuous circular path about an axis located near the point occupied by the middle pivot of the toggle when the latter is straightened, and the connecting-rod H, mounted at one end on the crank-pin and pivoted at the opposite end to the toggle, near the middle pivot of the latter, whereby the continuously-rotating crank is enabled without change of speed to advance the plunger slowly and powerfully and retract it rapidly.

3. In a baling-press, the plunger, the toggles E F, and the connecting-rod H and cranks I, in combination with the driving-shaft, its clutches and pinions, gearing, substantially as described, between the pinions and cranks, the clutch-operating levers, and the operating devices extending thence to a point near the feed-opening.

4. In combination with the plunger-operating toggle, the pusher, its parallel sustaining-arms *f g*, the former extended to encounter the retreating toggle, and the arm *f′*, attached to arm *f*, and arranged to encounter the advancing toggle.

In testimony whereof I hereunto set my hand, this 16th day of September, 1886, in the presence of two attesting witnesses.

ANDREW WICKEY.

Witnesses:
JAMES F. CARROTT,
GEORGE C. MCCRONE.