(No Model.) 2 Sheets—Sheet 1.

W. P. CANNING.

CARDING ENGINE.

No. 431,685. Patented July 8, 1890.

Fig. 1.

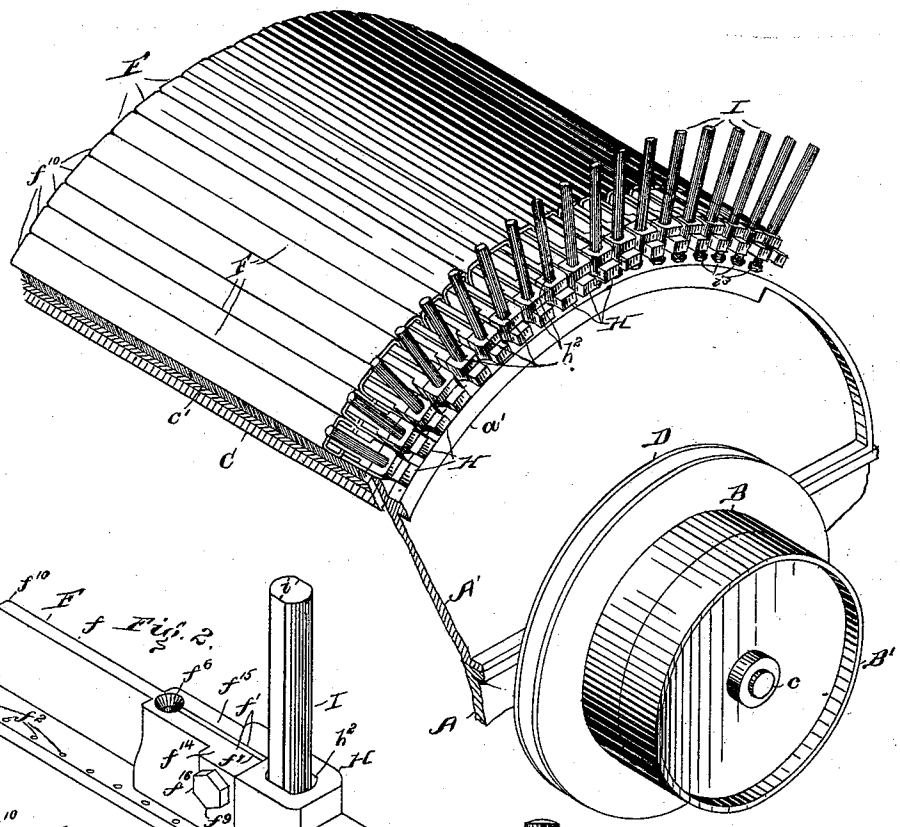


Fig. 2.

Fig. 3.

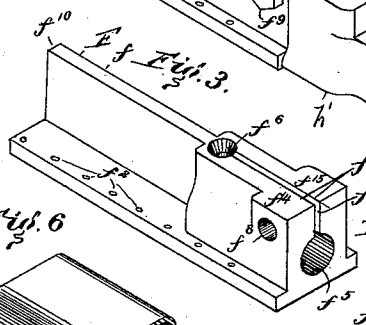


Fig. 4.

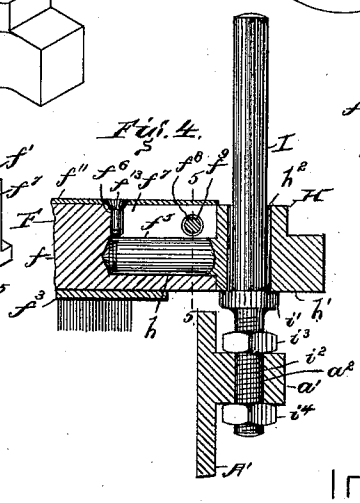


Fig. 5.

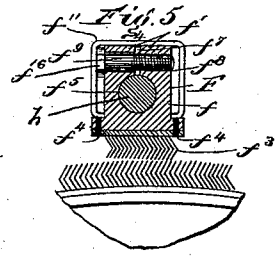
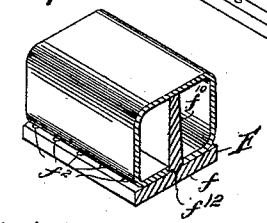


Fig. 6.



Witnesses—
Kirkley Hyde.
Mystic C. Beale

Inventor—
William P. Canning,
By Albert M. Moore,
His Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

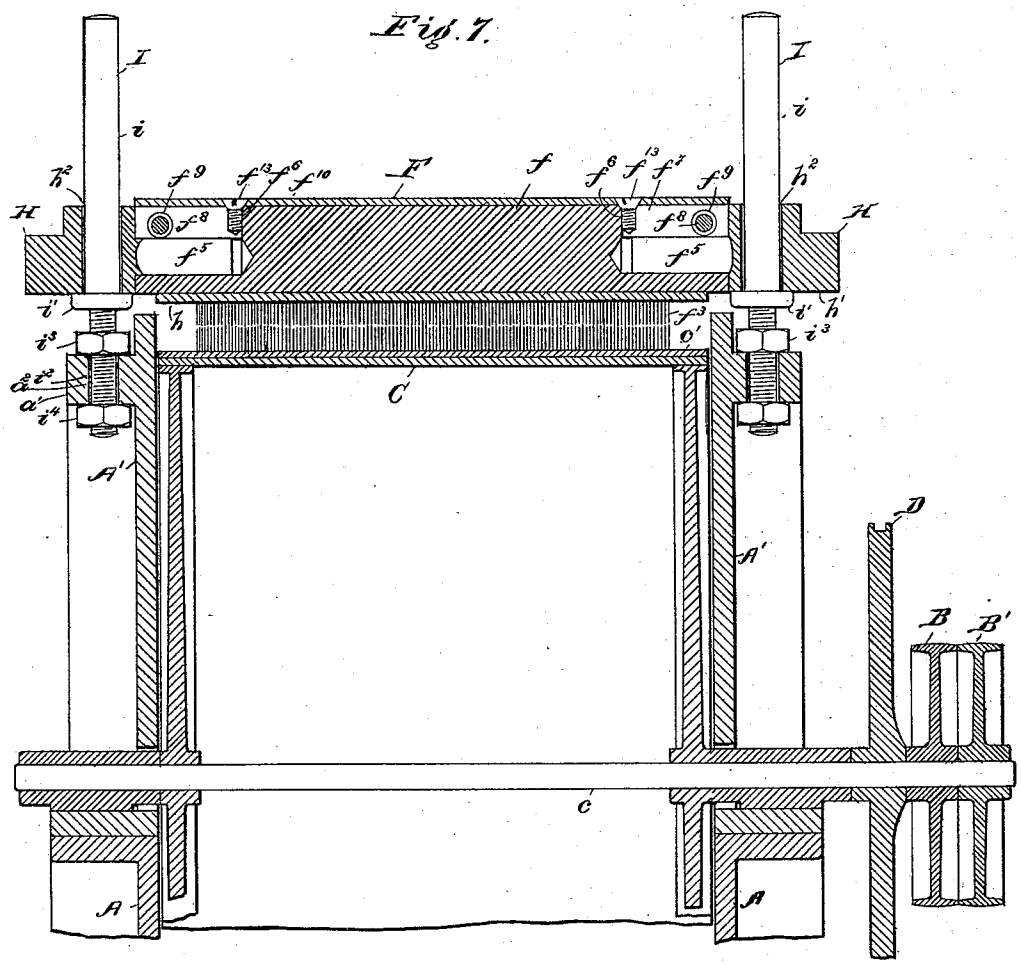
(No Model.) 2 Sheets—Sheet 2.

W. P. CANNING.

CARDING ENGINE.

No. 431,685. Patented July 8, 1890.

Fig. 7.



Witnesses—
Kirkley Hyde.
Mystic C. Beals.

Inventor—
William P. Canning,
By Albert M. Moore,
His Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM P. CANNING, OF LOWELL, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO THE LOWELL MACHINE SHOP, OF SAME PLACE.

CARDING-ENGINE.

SPECIFICATION forming part of Letters Patent No. 431,685, dated July 8, 1890.

Application filed June 7, 1889. Serial No. 313,437. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM P. CANNING, a citizen of the United States, residing at Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Carding-Engines, of which the following is a specification.

My invention relates to flats of carding-engines; and it consists in the means hereinafter described of adjusting such flats both with reference to their distance from the main cylinder of the carding-engine and also with reference to their pitch or the angle which they make to the surface of the cylinder.

In the accompanying drawings, Figure 1 is an isometric view of a part of the frame and arch of a carding-engine, the loose pulley, the fast pulley or driving-pulley, some flats, and a part of the main cylinder; Fig. 2, an isometric view of a portion of one of my improved flats, showing the swiveling head and binding-screw and omitting the flat-cover; Fig. 3, an isometric view of a part of the body of one of said flats, omitting the swiveling head, the binding-screw, and the flat-cover; Fig. 4, a longitudinal vertical section of one of said flats and of part of the arch and an elevation of a dagger or guide-pin; Fig. 5, a vertical section of the flat on the line 5 5 in Fig. 4 and an end elevation of a part of the main cylinder; Fig. 6, an isometric view of a vertical cross-section of a flat, showing its cover, the flats being represented without clothing in Figs. 2, 3, and 6 and clothed in the other figures; Fig. 7, a vertical transverse section in the plane of the axis of the main shaft of the upper part of the frame, arches, main cylinder, fast and loose pulleys, and the pulley which drives the lickers-in, showing the main shaft and two of the daggers in front elevation.

A is a part of the frame; A′, the arch, provided near its curved edge with the flange *a′*; B, the driving-pulley fast on the main shaft *c*; B′, the loose pulley on said main shaft; D, the pulley which drives the lickers-in; C, the main cylinder, having card-clothing *c′* on its curved surface, these parts being all of the usual construction and operation, and in practice used in connection with lap-rolls, feed-rolls, lickers-in, doffer, comb, and flat-stripping mechanism, substantially as shown in Letters Patent of the United States No. 16,504, granted January 27, 1857, to George Wellman, and other parts well understood and not necessary to be herein shown or described.

Wooden flats are commonly used with carding-engines of the class to which this application relates, and these are adjusted for pitch by four set-screws, two of which are driven into the top of the arch at each end of each flat, and the flat rests upon these screws when said flats are in carding position, the screws being arranged to project farther on the front side of the flat, or the side toward which the teeth of the cylinder C approach, so that the teeth of the cylinder in passing the flat constantly approach the teeth of the flat. The angle which the face of the flat makes to the surface of the cylinder is called the "pitch," and needs to be varied for different kinds and qualities of fiber, and is commonly varied by turning these screws to change the relative projection of the front and back screws. It is sometimes necessary to alter the distance between the flat and the cylinder, and this has heretofore been accomplished by turning all four of said screws to give them a greater or less absolute projection. Unless the screws are very carefully set, the flat will not rest equally upon all the screws and will rock upon its bearings, and the carding will be uneven.

Wooden flats are commonly guided partly by short guide-pins projecting from the arches at each side of the carding-engine, radially, or nearly so, said guide-pins being of a length sufficient to reach to the outer surfaces of said flats, and are also guided by short rods called "daggers," secured to the rocker or frame of the stripping mechanism, which daggers are received by guide-slots formed one in each end of each flat, as shown in the Wellman patent above referred to. The traverse rack and other parts of the stripping mechanism which cause its movement from flat to flat must be so adjusted that the daggers on the rocker will come immediately

over the guide-slots of the flat it is desired to strip, and it is found very difficult to adjust the rack in such a position that the daggers will register exactly with the guide-slots, especially as the flats are liable to become warped and twisted and the width of the guide-slots to be changed with every change in the humidity of the atmosphere.

The objections above named to the common wooden flats and the means of adjusting them are wholly obviated by the invention herein described.

The main part or body f of each flat F is preferably metallic, as cast-iron, to prevent warping of the same, and is planed true on its front and rear edges, and is preferably shaped in cross-section like an inverted T, to insure both lightness and strength, except that near the ends said main part f is enlarged to form clamps f', as hereinafter explained.

Making the main part of the flat of metal prevents its warping or being bent out of shape, if used with ordinary care, and allows of the flats being narrower, so that the raising of a single flat does not, to so great an extent, diminish the carding-surface of the carding-engine. The main part of each flat is provided with a series of holes f^2 along its front and rear edges, to enable the clothing f^3 to be secured thereto by metallic rivets or staples f^4, preferably the latter, such rivets or staples passing through untoothed edges of the card-clothing and through said holes. The enlarged ends f' are drilled at f^5 parallel with the longitudinal axis of the flat at each end, the holes f^5 being in line with each other.

The top of each flat, near each end, is provided with a screw-hole f^6, for a purpose hereinafter named, and the main part of the flat is sawed vertically to its face at f^7 from its ends in the plane of the axes of said holes f^5 into said last-named holes and into the screw-holes f^6, as shown in Figs. 2 to 5, to form the jaws f^{14} f^{15} of a clamp, and said enlarged ends are also drilled through transversely at f^8 at right angles to the sawed cut f^7, and in the hole f^8 is inserted a clamp-screw f^9, the hole in one of the jaws f^{14} nearest the head f^{16} of the screw f^9 being unthreaded and in the other jaw f^{15} threaded, as shown in Fig. 5, so that turning up the screw will draw the jaws f^{14} f^{15} toward each other. The heads H at opposite ends of the flat are both alike, and are also of metal. Each head H is provided with a stud h of a suitable size to enter and fit one of the holes f^5, and to be held from turning on the main part of the flat by turning up the screw f^9, which closes the jaws of the clamps, so that the lower flat face h' of the head can be turned, when the screw is loosened and by the clamp held at any desired angle with the face of the main part of the flat. Each head H is provided with an opening h^2 of a suitable size to admit one of the daggers I. The daggers I are preferably metallic rods nearly round, but flattened on the front and back, as shown at i in Fig. 2, to give a larger bearing-surface for the heads of the flat to rise and fall on. Each dagger I is provided with a collar i', on which one head of the flat rests, there being two daggers on each flat and each flat having two heads precisely alike. The lower part of the dagger below the collar i' is screw-threaded at i^2 and carries two nuts i^3 i^4, which are turned against the flange a' and near the outer sides thereof, there being as many holes a^2 in the flange as there are dagger-rods, the holes a^2 closely fitting the threaded part of the dagger-rod, but not being themselves threaded. By loosening one of the nuts i^3 i^4 and turning up the other one of said nuts the distance of the collar i' from the top of the arch A′ may be varied, and thereby the distance of the flat from the main cylinder when in its carding position may also be varied, the heads of the flats resting upon the collar i' and their dagger-rods when in such position.

Owing to the shape of the flats, it is desirable to provide some means to prevent the flyings from collecting between the ribs f^{10} on the backs of the flats and dropping when the flats are raised on the cylinder. I therefore make a cap f^{11} of sheet metal, preferably tin-plate, said cap being rectangular in cross-section, as shown in Figs. 5 and 6, and having an opening f^{12} wide enough to admit a rib f^{10}, said caps being of a sufficient depth to rest upon the top of a rib f^{10} and also upon the broad portion of the flat on each side of the rib, and long enough to extend almost from one clamp-screw f^9 to the other of said flats, leaving just space enough to allow said screws to be turned therein by means of a wrench. The caps are secured to the flats by screws f^{13} passing through the tops of said caps into the screw-holes f^6 above named. Each cover is of the width of the corresponding flat, so that the series of covers form a continuous smooth surface, which may readily be cleaned.

I claim as my invention—

1. The combination of the main cylinder, the frame having at opposite sides of the same arches, each provided with a flange concentric with said main cylinder, daggers having collars or shoulders and having screw-threaded shanks adapted to be inserted in radial holes with which said flanges are provided, nuts turning on said shanks above and below said flanges, and flats supported on said shoulders, whereby by the turning of said nuts the distance of said shoulders from said flanges and the distance of said flats from said cylinder may be varied, as and for the purpose specified.

2. A flat for a carding-engine, having swiveling heads provided with supporting-faces, to enable the angle which said supporting-faces make with the face of said flat to be varied to vary the pitch of said flat, as and for the purpose specified.

3. A flat having a main portion provided with a clamp at each end, and having heads

provided with shanks adapted to turn in said clamps when the same are loosened and to be held from turning by the tightening of said clamps, as and for the purpose specified.

4. A flat consisting of a main portion provided at each end with a hole, said holes being arranged in line with each other, and said flat being split at each end longitudinally into said holes to form the jaws of clamps, clamp-screws arranged to close the jaws of each clamp, and heads provided with shanks to enter said holes and to turn therein when said clamps are loosened and to be held from turning by the closing of said clamps, as and for the purpose specified.

5. The combination of a flat having a longitudinal rib on the back of the same, and having enlarged heads provided with screw-holes, with a cover of equal width with said flat and rectangular in cross-section, and having a central longitudinal opening to admit said rib, and screws passing through the top of said cover into said screw-holes, as and for the purpose specified.

6. The combination of a series of flats, each having a longitudinal rib on the back of the same, and having enlarged heads provided with screw-holes, with an equal series of covers, each being of equal width with one of said flats and rectangular in cross-section, and having a central longitudinal opening in said under side to admit a rib of one of said flats, and screws passing through the tops of said covers into said screw-holes to form a continuous surface for the tops of all said flats and to prevent the lodgment of flyings between said ribs, as and for the purpose specified.

In witness whereof I have signed this specification, in the presence of two attesting witnesses, this 27th day of May, A. D. 1889.

WILLIAM P. CANNING.

Witnesses:
ALBERT M. MOORE,
ALBERT J. BIXBY.