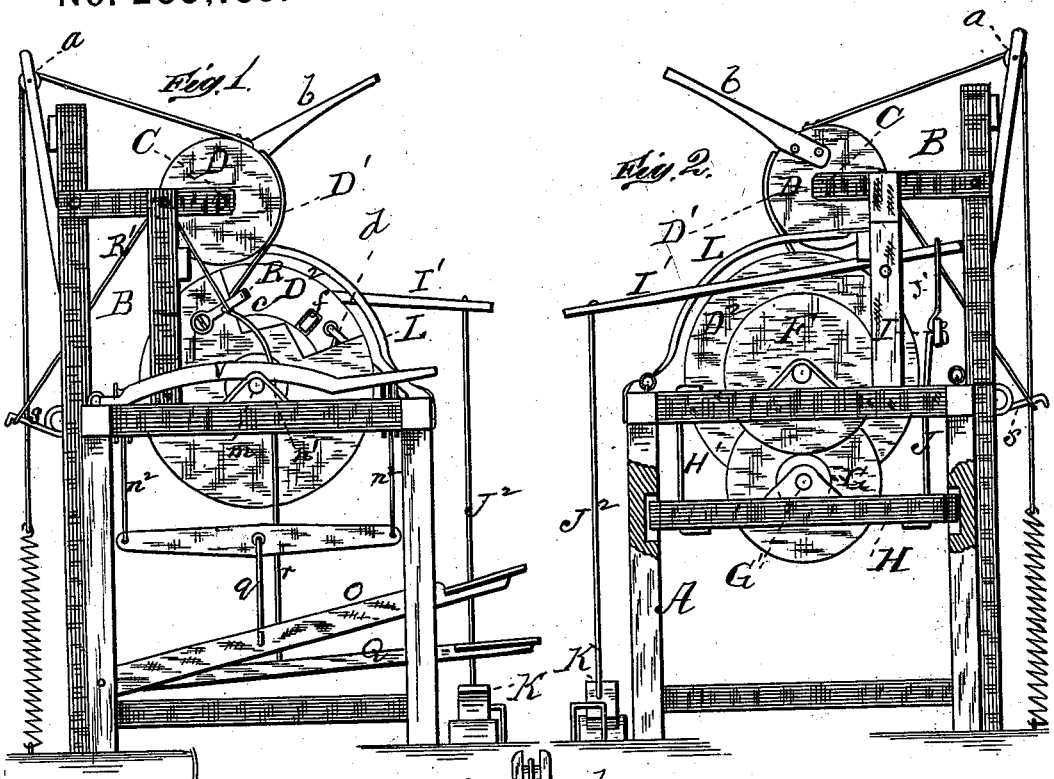
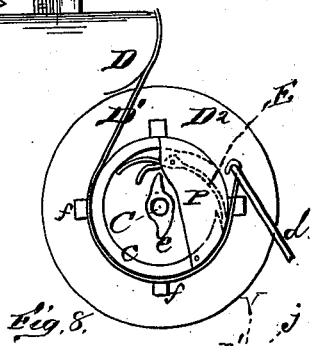
2 Sheets—Sheet 1.

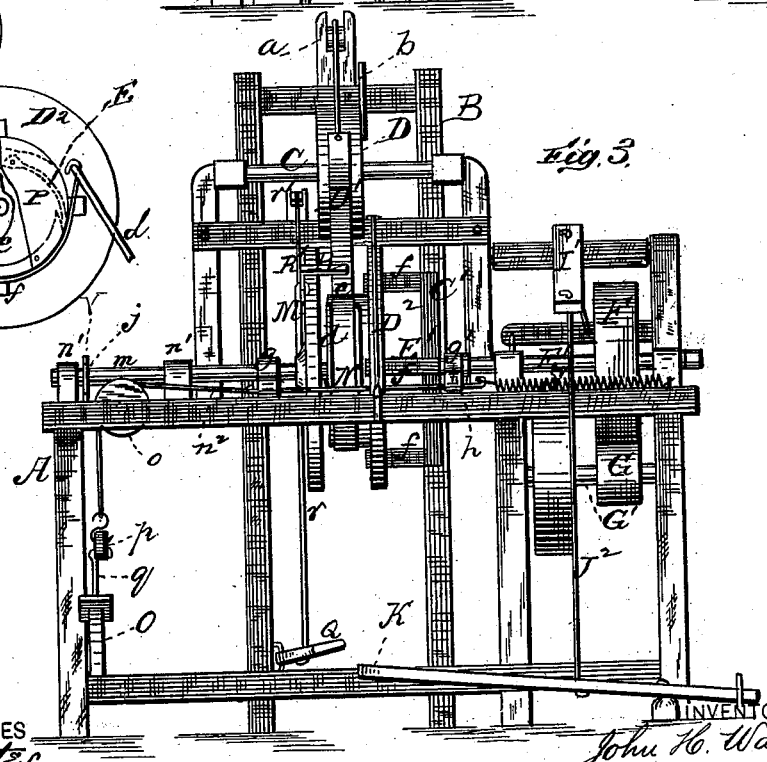
J. H. WARD.

Machine for Coiling Hoops.

No. 209,735. Patented Nov. 5, 1878.







WITNESSES

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2 Sheets—Sheet 2.

J. H. WARD.

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Fig. 4.

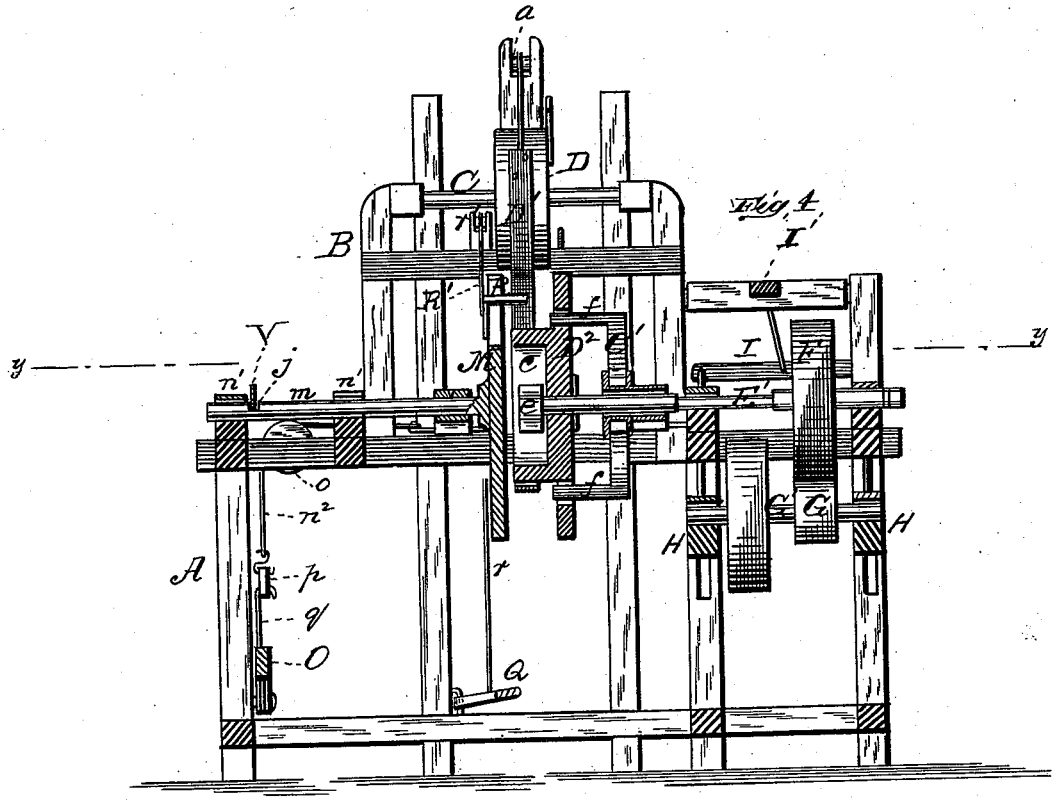


Fig. 5.

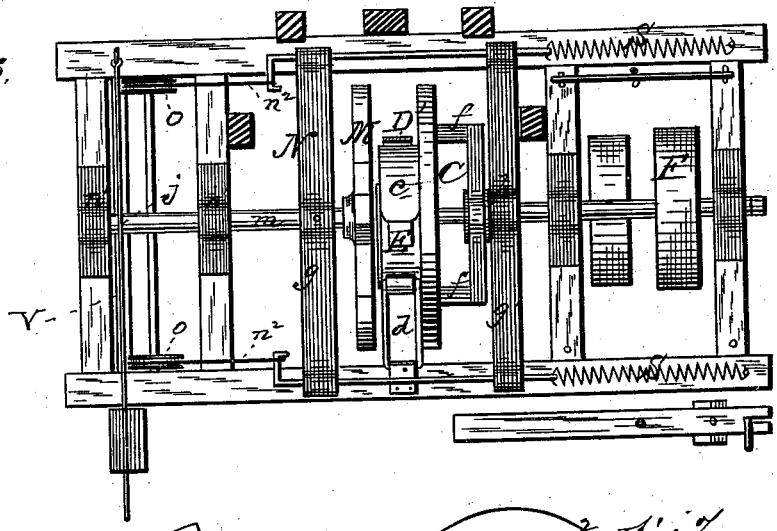


Fig. 6.

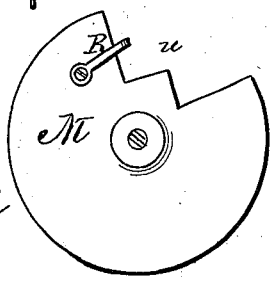
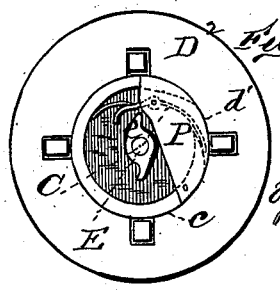


Fig. 7.



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UNITED STATES PATENT OFFICE.

JOHN H. WARD, OF DELPHOS, OHIO.

IMPROVEMENT IN MACHINES FOR COILING HOOPS.

Specification forming part of Letters Patent No. **209,735**, dated November 5, 1878; application filed September 14, 1878.

To all whom it may concern:

Be it known that I, JOHN H. WARD, of Delphos, in the county of Van Wert and State of Ohio, have invented a new and valuable Improvement in Hoop-Coilers; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figures 1 and 2 of the drawings are representations of end views of my improved hoop-coiler. Fig. 3 is a front view thereof. Fig. 4 is a longitudinal vertical section of the same. Fig. 5 is a horizontal section taken through the line *y y* of Fig. 4; and Figs. 6, 7, and 8 are details.

The nature of the invention consists in combining with a coiling-head having a throat and griper a steel face-plate removably secured to said head across its throat.

It also consists, in the combination, with a coiling-head and a guard-plate laterally movable relative thereto, and adapted to hold the coil upon the said head, of a check-lever engaging the stem of the said plate and holding it stationary.

It also consists in combining with a coiling-head and a double-notched guard-plate working therewith an angular finger pivoted to said plate and extending across its edge, a treadle mechanism actuating said finger, and a spring raising the latter after each operation.

It also consists in combining, with a revolving head the curved stationary guard-strip arranged slightly to one side of said head, and over the former for the purpose of preventing the coil from binding on said head.

It finally consists in the construction and novel arrangement, in a hoop-coiling machine having a pulley and carrying a rotating coiler-head, of the vibrating beams, the hangers suspending one end of said beams, the shaft having its bearings in said beams, and carrying a driving-pulley, the treadle-lever, connecting-bar, and the rods connecting the remaining ends of said beams to the said bar, as hereinafter more fully shown and described.

In the annexed drawings, the letter A designates the frame of my improved hoop-coiler, the same being a strong upright structure, having at its rear part an elevated portion, B, carrying a pulley, *a*, and in front thereof affording bearings to a shaft, C, upon which is rigidly secured a pulley, D. This latter has a lever, *b*, secured to it for the purpose of causing it to turn and tighten a metallic band, D^1, that passes under and around an annular former, *c*, upon the coiling-head D^2, and is then secured to a vibrating arm, *d*, upon the front of the frame. The head D^2 is loosely applied upon the end of a shaft, E′, directly under the pulley D, and is provided inside of the former *c* with a vibrating griper, E, the biting end of which extends through the throat *d′* of the former *c* aforesaid, and forms therewith a second jaw. The heel of this griper is engaged when the shaft E′ is rotated by a dog, *e*, rigidly secured upon the end of said shaft inside of the coil-former, thus locking the head to the said shaft, and causing the griping end of the griper to bear forcibly against the lower edge of the throat in such manner that the end of a hoop introduced in the throat under the griper will be vigorously held.

F indicates a pulley rigidly secured to shaft E′ near the right-hand end of the frame, beneath which is a driving-pulley, G, upon a shaft, G′, through which motion is communicated to the coiler. Shaft G′, has its bearings in two spaced beams, H, suspended from the frame at one of their ends by the hangers H′ and at the other from the connecting-bar I of a treadle-lever, I′, by the rods J. The ends of beams H are loosely engaged in guideways in the uprights of the frame, which, while allowing them free vertical vibration, causes them to move in exactly vertical planes.

The bar I is connected to the lever I′ by a rod, J^1, and with a treadle, K, by a like rod, J^2. Consequently when the treadle is depressed the beams H are raised equally and the pulley G is brought up squarely against the pulley F of the shaft E′, thus effectually preventing slipping, and imparting a reliable rotation to the coiling-head, by which means the hoops are rolled up into tight close coils.

C′ represents a pusher having free lateral motion upon the shaft E′, and composed of arms radiating from a hub, and provided with

fingers *f*, extending through the head D^2, just outside of the annular former *c*. After the formation of a coil of hoops the fingers *f* of the pusher are thrust through the head against it, thrusting it off the former *c* and from between it and the tightening-band, allowing it to fall to the ground. During the act of coiling the hoops are held off from the head D^2 by means of the curved metallic guard-strip L, the coil being thus prevented from binding on the said head, and being crowded between the former *c* and the steel band. Across the throat of said former is secured, removably, a steel face-plate, P, having in its edge a notch that allows the griped end of the hoop to pass out from the griper when the coil is pushed off. This plate is very liable to breakage from the strain to which it is subjected, and when broken may be speedily replaced, as its breaking can never involve the coiler-head. The coil is held upon the former *c* by means of a guard-plate, M, rigidly secured upon a rigid rod, *m*, fixed to the end bar *g* of a strong endwise-movable frame, N, and guided during the sliding of said frame by the loops *n'* of frame A. The side bars of this frame N are carried beyond the pusher, and are connected by an end bar, *g'*, sliding freely upon the shaft E' by means of a sleeve, *h*, through which the said shaft passes. The ends of the frame N, to the left of plate M, carry cords n^2, that pass over grooved pulleys *o*, and are secured to the contiguous ends of a metallic bar, *p*, which bar is connected to a treadle, O, by means of a rod, *q*. The remaining ends of this frame are secured to the spiral springs S, attached securely at their other ends to the frame A, and by their reaction holding the said plate firmly against the face of former *c*.

By depressing the treadle O, the pusher is actuated to remove the coil and the guard-plate retracted to make room for such removal simultaneously by the sliding frame, and they are returned to their proper normal positions by the reacting of the springs.

The end of the coil is held while being nailed to its body by means of an angular finger, R, pivoted to the guard-plate M, and drawn down through a notch, *u*, in its edge by a treadle, Q, and connecting-rod *r*. When the said treadle is released the holding-finger is raised up out of the way by means of a rope, R', extending upward over a pulley, *r'*, thence downward to a spring, *s*, to which it is rigidly secured. In order to hold the guard-plate absolutely quiet, its stem-rod is provided inside of one of the guides upon the frame with a cross-kerf, *j*, with which a lever, V, fulcrumed on the main frame, is adapted to engage. When engaged with the kerf the guard-plate is held against the former *c*, but when raised allows the said guard-plate to be moved back therefrom by operating the treadle O.

I do not wish to be understood as confining myself strictly to the specific devices above described, as there are many ways in which they may be modified without going outside of the scope of this invention.

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

1. The combination, with a coiling-head, having a throat and griper, of a steel face-plate removably secured to the said head across its throat, as and for the purpose specified.

2. The combination, with a coiling-head and a guard-plate, laterally movable relative thereto, and adapted to hold the coil upon the said head, of a check-lever, engaging the stem of the said plate and holding it stationary, substantially as specified.

3. In a hoop-coiling machine, the combination, with a shaft, E', having a pulley, F, and carrying the rotating coiler-head, D^2, of the vibrating beams H, the hangers H', suspending one end of said beams, the shaft G', having its bearings in said beam and carrying the driving-pulley G, the treadle-lever I', connecting-bar I, and the rods J, connecting the remaining ends of said beams to the said bar I, substantially as specified.

4. The combination, with a coiler-head, D^2, and a double-notched guard-plate, M, working therewith, of the angular finger R, pivoted to said plate and extending across its edge, a treadle mechanism actuating said finger, and a spring, S, raising the latter after each operation, substantially as specified.

5. The combination, with the revolving head D^2, of the curved stationary guard-strip L, arranged slightly to one side of said head and over the former *c*, for the purpose of preventing the coil from binding on said head, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

JOHN H. WARD.

Witnesses:
B. J. BROTHERTON,
W. H. FULLER.