(No Model.)

H. BAKER.

MACHINE FOR BINDING STRAW.

No. 407,319. Patented July 23, 1889.

Fig 1

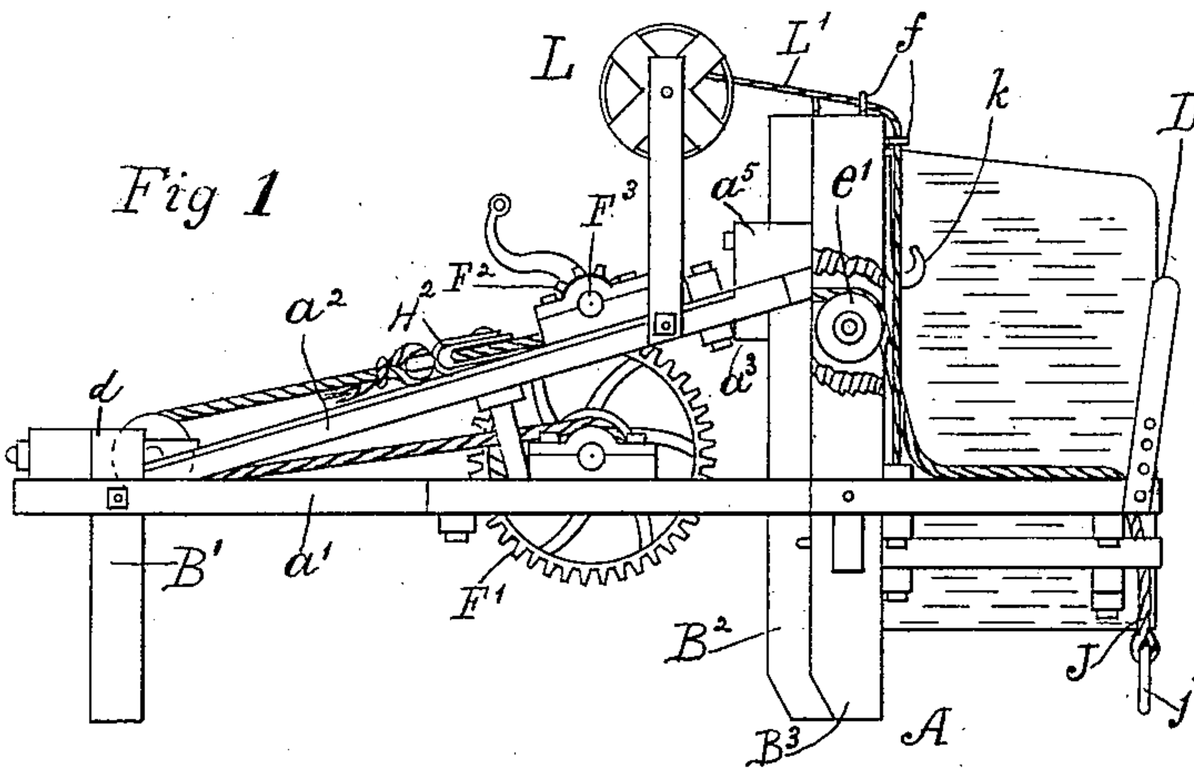


Fig 3

Fig 2

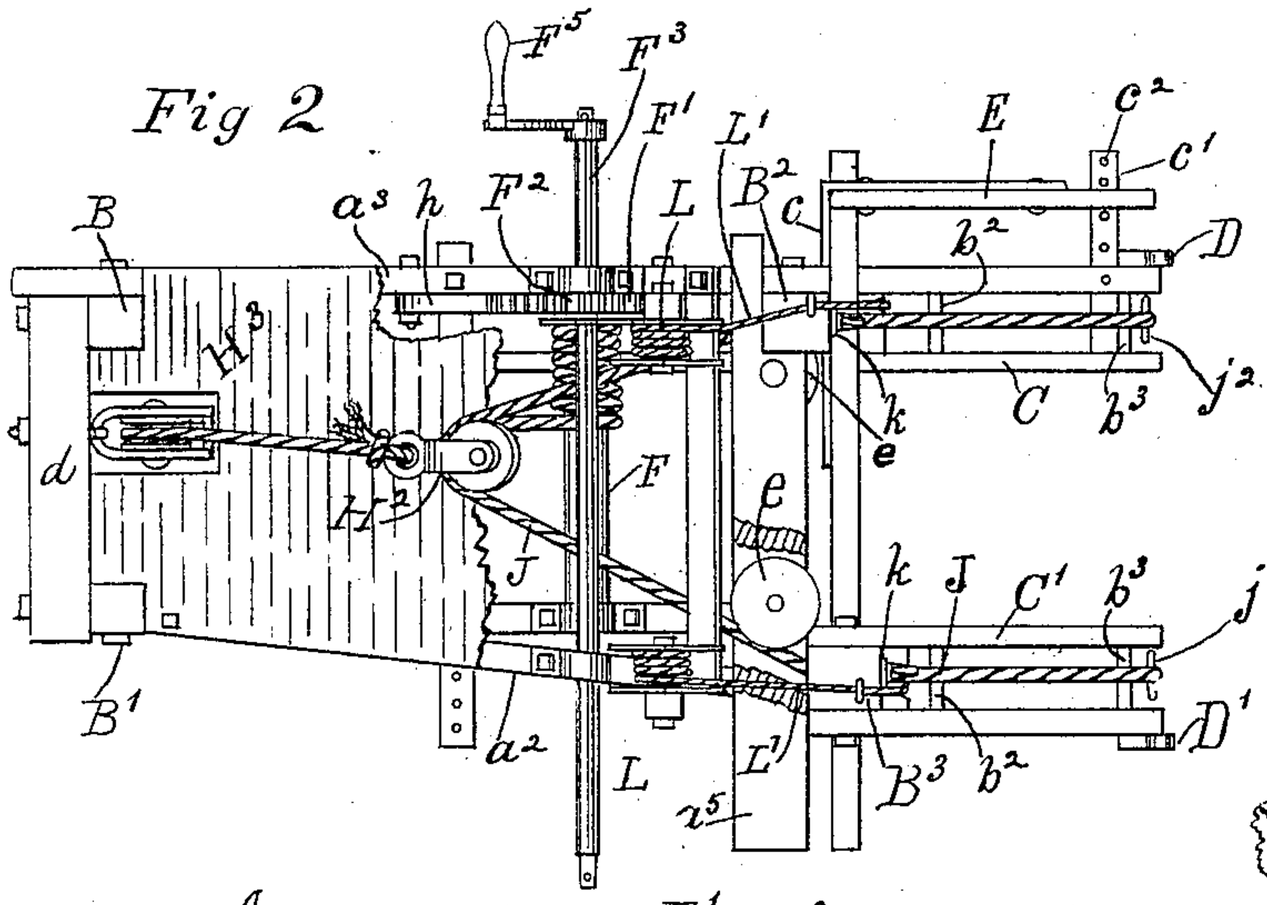


Fig 6

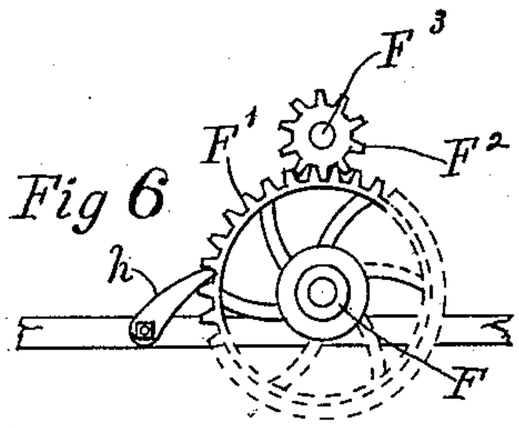


Fig 5

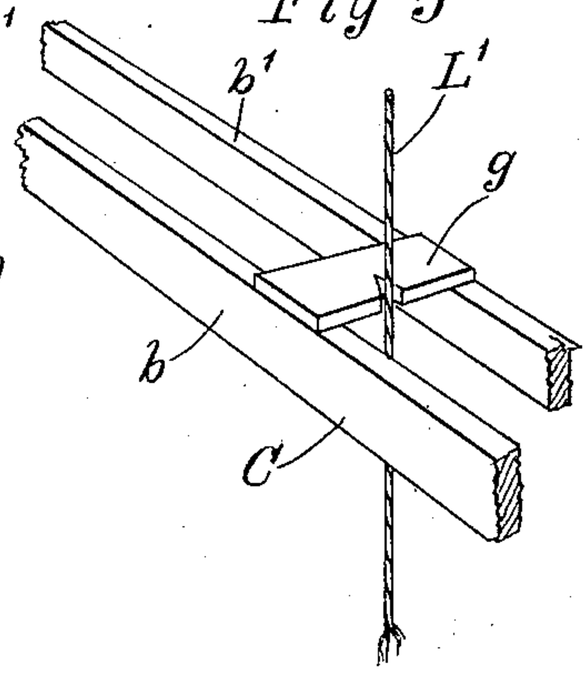
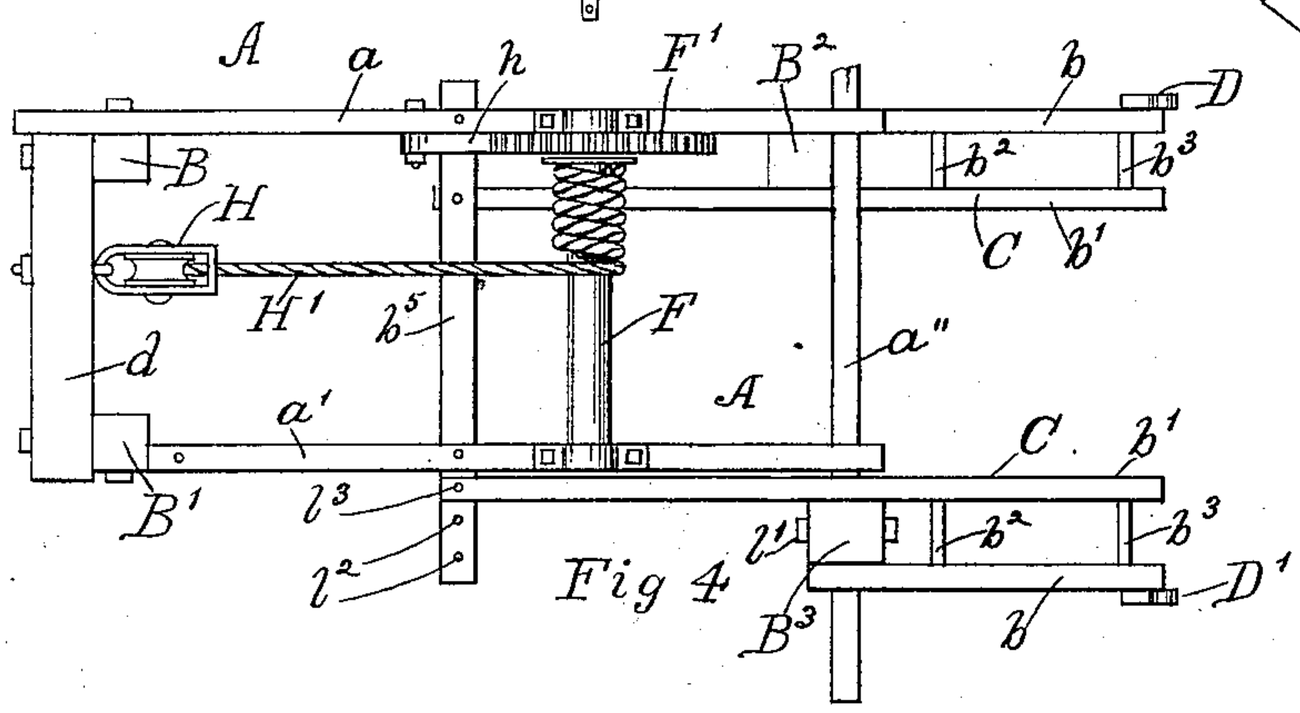


Fig 4



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UNITED STATES PATENT OFFICE.

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MACHINE FOR BINDING STRAW.

SPECIFICATION forming part of Letters Patent No. 407,319, dated July 23, 1889.

Application filed February 7, 1889. Serial No. 299,046. (No model.)

To all whom it may concern:

Be it known that I, HAMILTON BAKER, a citizen of the United States, residing at Pitsburg, in the county of Darke and State of Ohio, have invented certain new and useful Improvements in Machines for Binding Straw, of which the following is a specification.

My invention relates to improvements in machines for binding straw.

The object of my invention is to provide a machine especially adapted for binding rye-straw—such as is used for stuffing horse-collars, &c.—in bundles of suitable size for transportation and for the market. Straw for this purpose is required to be long and straight, and is usually placed in bundles of uniform size. Rye-straw is generally used, and the rye flailed out to prevent breaking the straw.

My invention consists in the constructions shown and described, and hereinafter pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of a machine embodying my invention. Fig. 2 is a plan, and Fig. 3 a front elevation, of the same, some of the parts being broken away in Fig. 2. Fig. 4 is a plan view showing the arrangement of the windlass, the upper portion of the device being removed. Figs. 5 and 6 are detail views hereinafter referred to.

Like parts are indicated by similar letters of reference throughout the several views.

In the said drawings, A A represent the main frame of the machine, which is supported at each end by posts B, B′, B^2, and B^3. The posts B, B′, and B^2 are constructed rigidly with and form a definite part of the frame A A, the post B^3 being connected therewith in such a manner as to be adjusted for the purpose hereinafter described. The main frame consists of the lower longitudinal side pieces a a' and the upper supporting-pieces a^2 and a^3, which extend upwardly and forwardly from the rear supporting-posts B B′ at an angle to the lower longitudinal pieces a a'. The upper supporting-pieces a^2 and a^3 are connected together at the front end by transverse connecting-pieces a^5 and a^7, which also serve to connect said pieces to the forward supporting-posts B^2 and B^3. A similar transverse connecting-piece a^{11} connects the lower longitudinal pieces a and a', and is also connected to the posts B^2 and B^3, as hereinafter more fully described.

Extending forwardly from the posts B^2 and B^3 are the supporting-arms C and C′, which form the binding-table. These supporting-arms are each composed of two longitudinal pieces b' and b', each attached to the supporting-posts B^2 and B^3, and connected together at suitable intervals by small connecting-rods b^2 and b^3. The longitudinal bar or piece b' of the supporting-arms C and C′ is extended backwardly beyond the posts B^2 B^3, respectively, and attached to a cross-bar b^5, which extends across and is connected to the longitudinal side pieces a a'.

The extending arms C and C′ form the bottom of the binding-table upon which the straw is placed to be bound. Each of said arms is provided at the outer extremity with an upwardly-extending pivoted arm D and D′, which, together with the supporting-posts B^2 B^3, form a cradle or receptacle to receive the straw to be bound.

E is a butt-board, which is connected at the top and bottom, respectively, to the post B^2 and to the extending arm C by projecting arms c and c', each of which is provided with a series of openings c^2, adapted to receive the connecting pins or bolts c^3 and c^5, which secure the butt-board in place and furnish means for adjusting the same to or from the supporting-arm C.

Supported on the lower longitudinal pieces a and a' is a windlass F, provided at one end with a spur-gear F′, adapted to be engaged by a suitable pinion F^2 on a shaft F^3, which projects across the main frame and is supported in suitable bearings on the upper supporting-piece a^2 and a^3. The shaft F^3 is preferably made square at each end and adapted to receive a handle or crank F^5 at either or both ends, as desired. Secured at the rear end of the frame to a cross-piece d, attached to the supporting legs or posts B B′, is a fixed pulley H, over which passes a rope H′, connected at one end to the windlass F and at the other to a movable pulley H^2, supported above the upper supporting-pieces a^2 a^3, which are decked over by a covering H^3 to form a support for the movable pulley H^2, which is adapted to slide thereon.

Extending around the loose pulley H^2 is a

rope J, the free ends of which are provided with rings or eyes J′ and J², adapted to engage with suitable hooks K and K′, secured to the posts B² and B³.

The rope J, I term the "binding-rope," and the free or outer portions thereof in the normal position rest on the cross-pieces b^2 b^3 of the projecting arms C C′. This rope J passes forward at each end from the movable pulley H² over horizontal guiding-pulleys *e*, located between the cross-pieces a^5 and a^7, and thence over small vertical supporting-pulleys *e*′, mortised in the posts B² B³ immediately below the hooks K K′.

L L are the cord-spools which hold the cord L′, which is used in tying the bundles. Two of these spools are preferably used, one for each supporting-arm C C′. The cord L′ from each spool passes through suitable guiding-eyes *f* on the posts B² B³, thence down through the supporting-arms C C′, where the free ends are secured by pressing the same into a notched holding-piece *g*, placed at the rear of each of the supporting-arms C C′.

In operation the straw is placed upon the supporting-arms C C′ between the upper projecting arms D D′ and the supporting-posts B² B³, with the butts resting against the buttboard E. The butt-end of the bundle being considerably larger than the head, this end of the binding-table is made of greater capacity than the other end. This is accomplished by setting the supporting-post B² back of the supporting-post B³, as shown in Figs. 1, 2, and 4. The straw having been placed in position on the table, the ends of the binding-rope J are drawn around each end of the bundle and the rings J′ and J² placed in the hooks K and K′. By turning the crank F⁵ the rope H′ is caused to wind around the windlass F, and thus draw the movable pulley H² along the deck or covering H³, taking up the slack in the binding-rope J. The pulleys *e*′ being located immediately below the hooks K and K′ in the posts B² B³, the rope J is caused to completely encircle the sheaf or bundle, which, by the turning of the windlass, is drawn tightly together. By reason of the movable pulley H² the binding-rope J is adapted to adjust itself to the respective ends of the bundle—that is, at the heads and butts—and thus bind equally tight without regard to the relative sizes of the same. A pawl *h*, adapted to engage in the teeth of the gear F′, serves to hold the same in any desired position. When the bundle is drawn sufficiently tight, the ends of the cord L′ are released from their holders *g* and drawn around the sheaf or bundle and tied by hand. The pawl *h* is then released and the expansion of the straw fills out the binding-cord, after which by further loosening the rope J the rings can be unhooked and placed in position for another bundle.

The supporting-post B³ and its arm C′, as before stated, are connected loosely to the main frame A A. The transverse connecting-pieces a^5 and a^{11}, respectively, where they are connected to the post B³, are provided with a series of openings *l*, adapted to receive connecting-bolts *l*′, which pass through the said posts and cross-pieces. The cross-bar b^5 is also provided with a series of openings l^2, adapted to receive the connecting-bolt l^3, which secures the rear end of the side piece *b*. Means are thus provided whereby the binding-table may be adjusted to bind different lengths of straw, as desired.

The machine as thus described is especially adapted for binding rye-straw for the purpose first mentioned; but it is obvious that it may be used for other purposes where it is desired to bind bundles of unequal size at the respective ends, the construction being such that either end will be bound equally tight without regard to the relative sizes of the said ends.

Having thus described my invention, I claim—

1. The combination, in a straw-binder, of a main frame and a binding-table, a windlass supported on said main frame, a movable pulley connected, as described, to said windlass, a binding-rope passing over said movable pulley, with its extremities resting on said binding-table, rings in said binding-rope adapted to engage with stationary hooks on said binding-table, and means, substantially as described, for revolving said windlass, substantially as and for the purpose set forth.

2. The combination of a main frame having a lower longitudinal piece and the upper supporting-pieces at an angle thereto, a movable pulley supported on said upper supporting-pieces, a windlass on the lower longitudinal supporting-pieces connected to the said movable pulley by a rope passing over a fixed pulley on the said main frame, a binding-table having projecting arms adapted to support the ends of a binding-rope which passes over said movable pulley, rings in said binding-rope, and stationary hooks in said binding-table, substantially as and for the purpose set forth.

3. The combination of a main frame having the projecting arms which form the bottom of the binding-table, said projecting arms each consisting of two parallel longitudinal pieces having connecting-bars therein, a supporting-post to which said arms are connected, supporting-pulleys in each of said posts, a binding-rope passing over said pulleys, a movable pulley over which said rope passes, stationary hooks on said posts adapted to be engaged by the rings in the ends of said binding-rope, and means, substantially as described, for drawing said movable pulley against the loop formed in the said binding-rope to cause the same to draw equally from each end, substantially as described.

4. The combination, with a main frame, of the supporting-arms forming a binding-table, the supporting-posts having the stationary hooks therein, and a binding-rope passing

through said posts, and a movable pulley around which said rope passes, rings in the ends of said binding-rope adapted to engage said hooks, cord-spools on said main frame, and a notched cord-holder device on each of said supporting-arms, an adjustable butt-board at one end of said binding-table, and means, substantially as described, for drawing said movable pulley against the loop in said binding-rope, substantially as specified.

5. In a straw-binder, the combination, with a main frame, of the supporting-posts B^2 B^3, the supporting-arms secured thereto, stationary hooks on said posts, supporting-pulleys in said posts immediately below said hooks, a binding-rope passing at each end over said supporting-pulleys and provided with rings or loops to engage said hooks, a movable pulley in the loop or bight of said binding-rope, and means, substantially as described, for operating said movable pulley to tighten said binding-rope, substantially as specified.

6. The combination, with a main frame, of the front supporting-posts located in different planes to form a binding-table of different capacities at each end, supporting-arms on said posts, stationary hooks and supporting-pulleys supported adjacent to each other by the said posts, a binding-rope passing over said pulleys and provided with rings or loops adapted to engage said hooks, a movable pulley over which said rope passes between the said posts, means, as described, for operating said movable pulley, cord-spools supported on the said frame, and cord-holding pieces on the said supporting-arms, substantially as specified.

7. The combination, with a main frame having a windlass supported thereon and provided with an upper deck portion, and a movable pulley supported on said deck portion and attached to said windlass, of a binding-table having stationary hooks, guiding and supporting pulleys, and a binding-rope passing around said movable pulley and over said guiding and supporting pulleys and adapted at each end to engage the respective hooks, substantially as set forth.

8. The combination of a main frame, a windlass, and a movable pulley supported on said frame, said movable pulley being attached to said windlass, a crank-shaft having a pinion adapted to engage a spur-gear on said windlass, a pawl to limit the motion of said windlass, a binding-table and binding-rope, as described, and stationary hooks adapted to engage the free ends of said binding-rope, which passes over suitable guiding and supporting pulleys and around said movable pulleys, substantially as and for the purpose set forth.

9. The combination, with a main frame, of the front supporting-posts, supporting-arms secured thereto, a binding-rope adapted at each end to engage stationary hooks on said posts, a movable pulley at the rear of said posts around which said rope passes, a windlass for operating said movable pulley, and means, substantially as described, for adjusting one of said supporting-posts and its supporting-arm, substantially as specified.

In testimony whereof I have hereunto set my hand this 2d day of February, A. D. 1889.

HAMILTON BAKER.

Witnesses:
R. S. WHEELER,
A. F. SHULER.