No. 687,737. Patented Dec. 3, 1901.

G. FENSOM.

FLOUR BOLTING MACHINE.

(Application filed Mar. 15, 1900.)

(No Model.) 3 Sheets—Sheet 1.

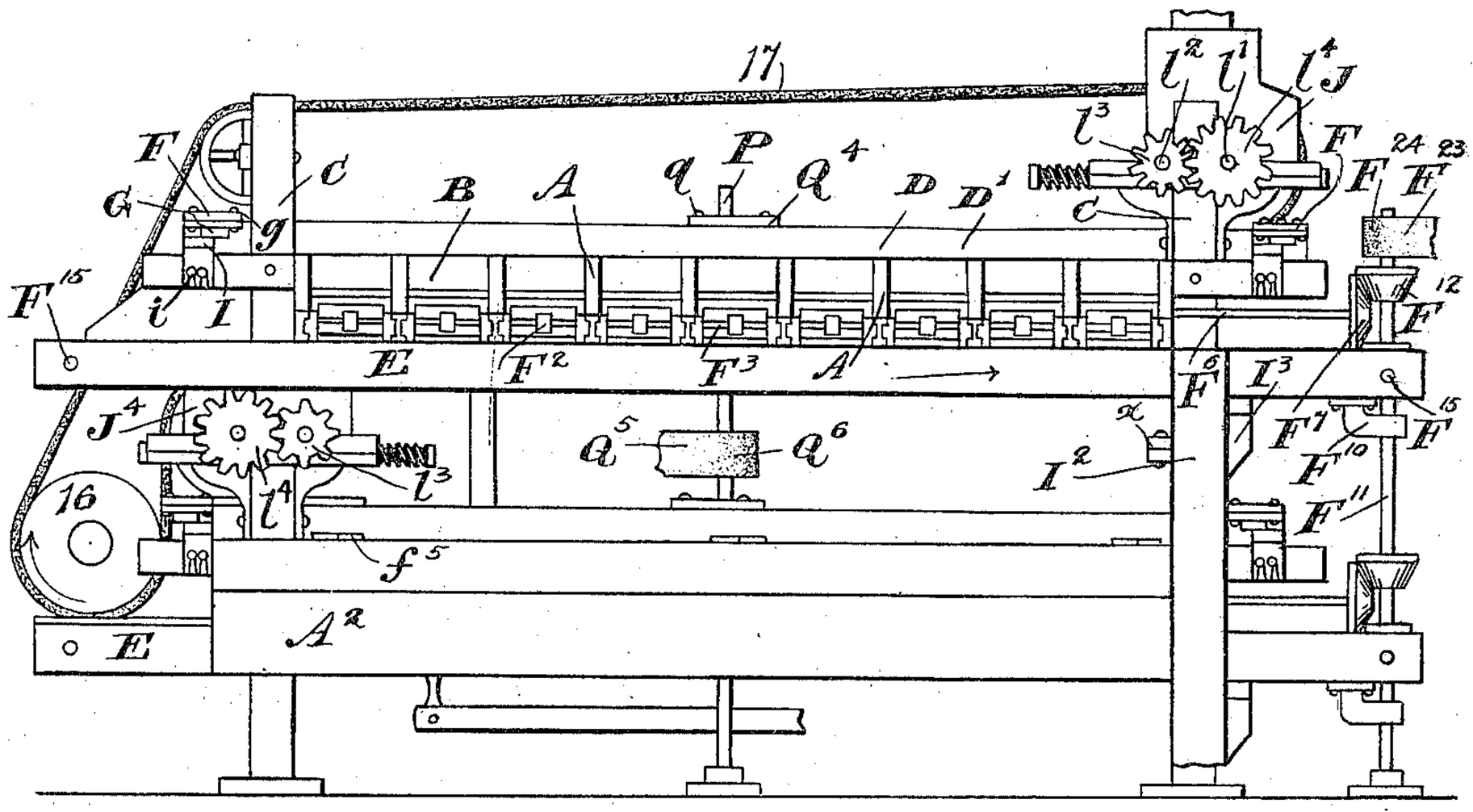

Fig. 1.

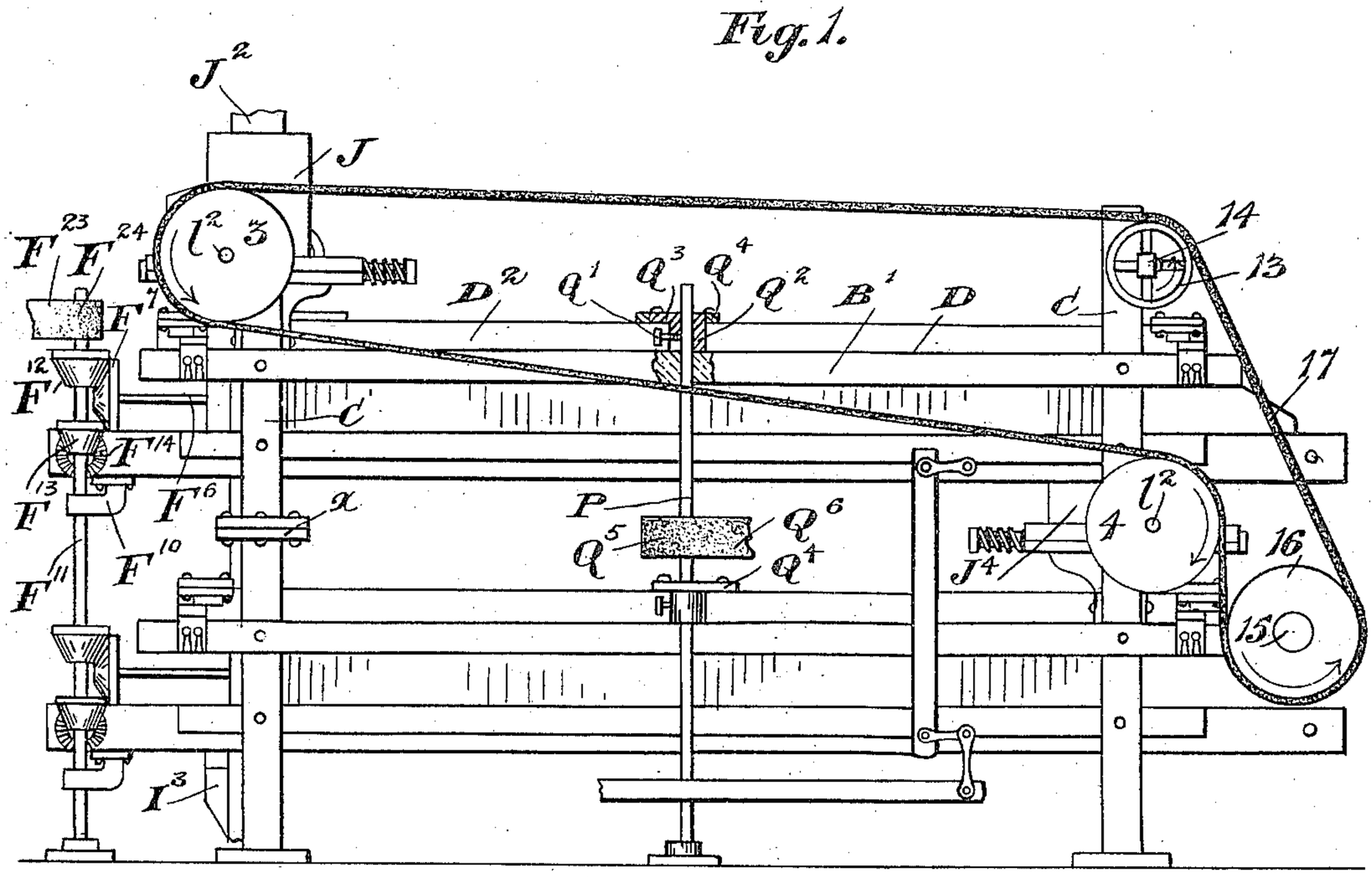

Fig. 2.

Witnesses.
L. C. Reynolds,
J. M. Ferguson

Inventor:
G. Fensom,
by Egerton P. Case,
Atty.

No. 687,737. Patented Dec. 3, 1901.

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FLOUR BOLTING MACHINE.

(Application filed Mar. 15, 1900.)

(No Model.) 3 Sheets—Sheet 2.

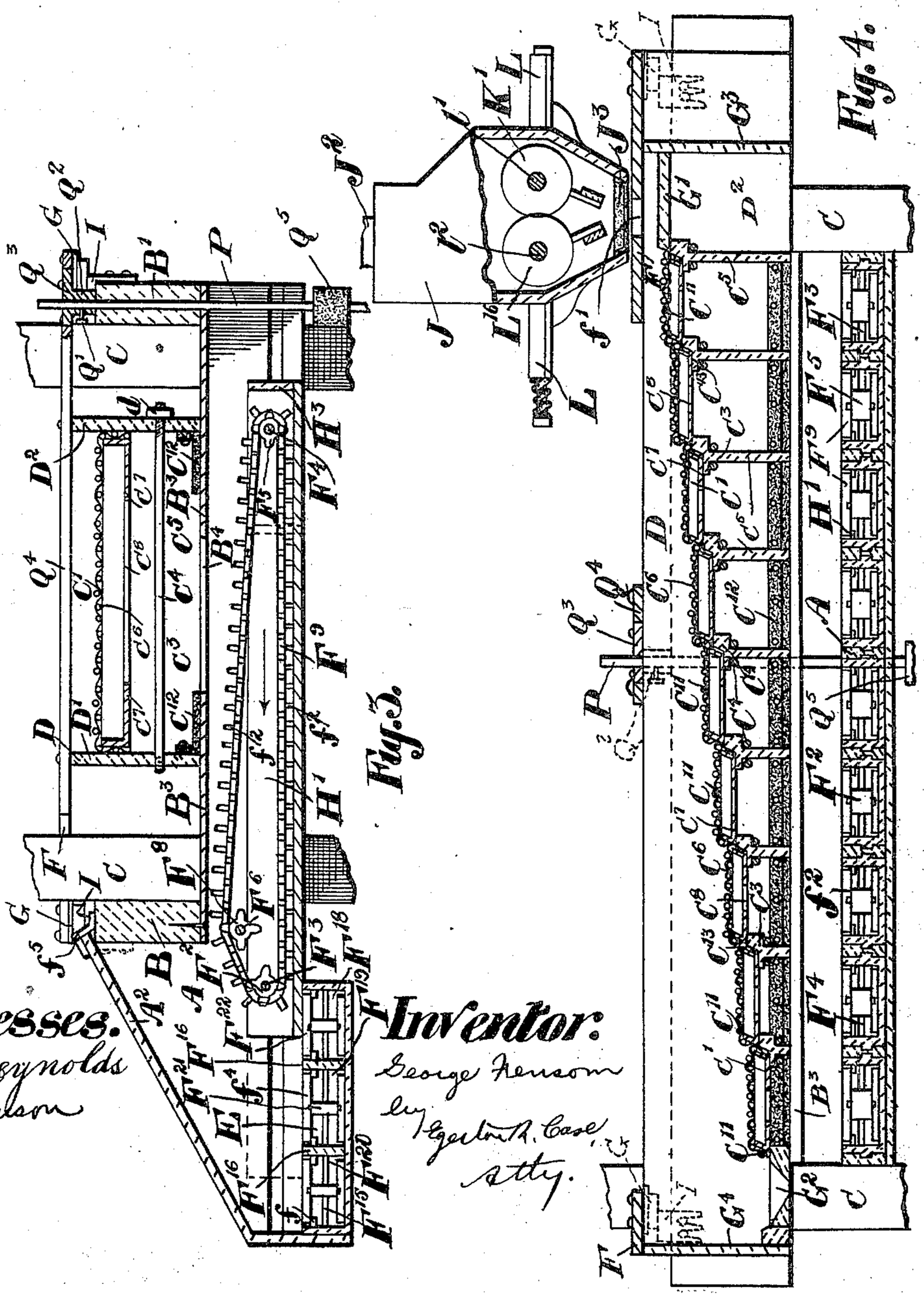

Fig. 3.

Fig. 4.

Witnesses.
L. C. Reynolds
J. W. Ferguson

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George Fensom
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G. FENSOM.

FLOUR BOLTING MACHINE.

(Application filed Mar. 15, 1900.)

(No Model.) 3 Sheets—Sheet 3.

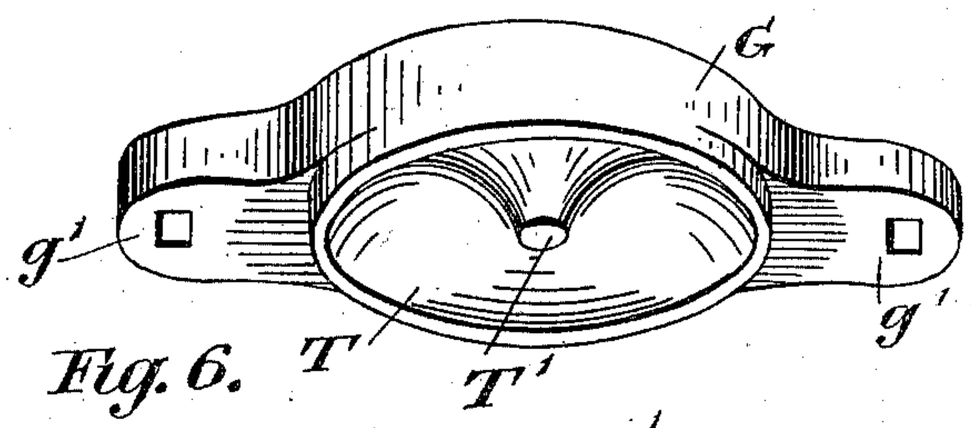

Fig. 6.

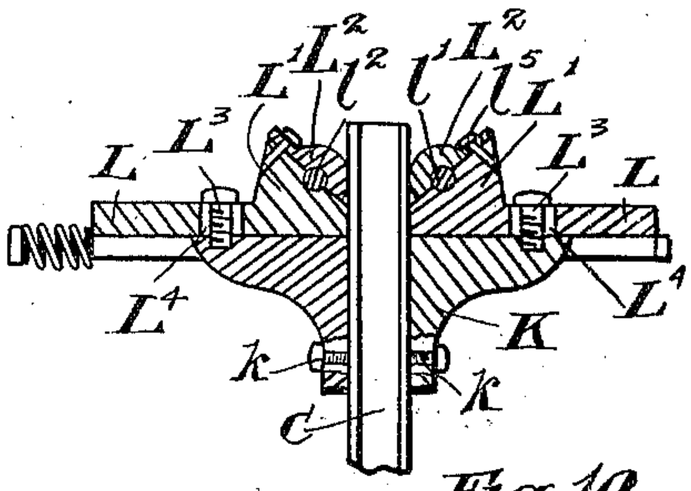

Fig. 10.

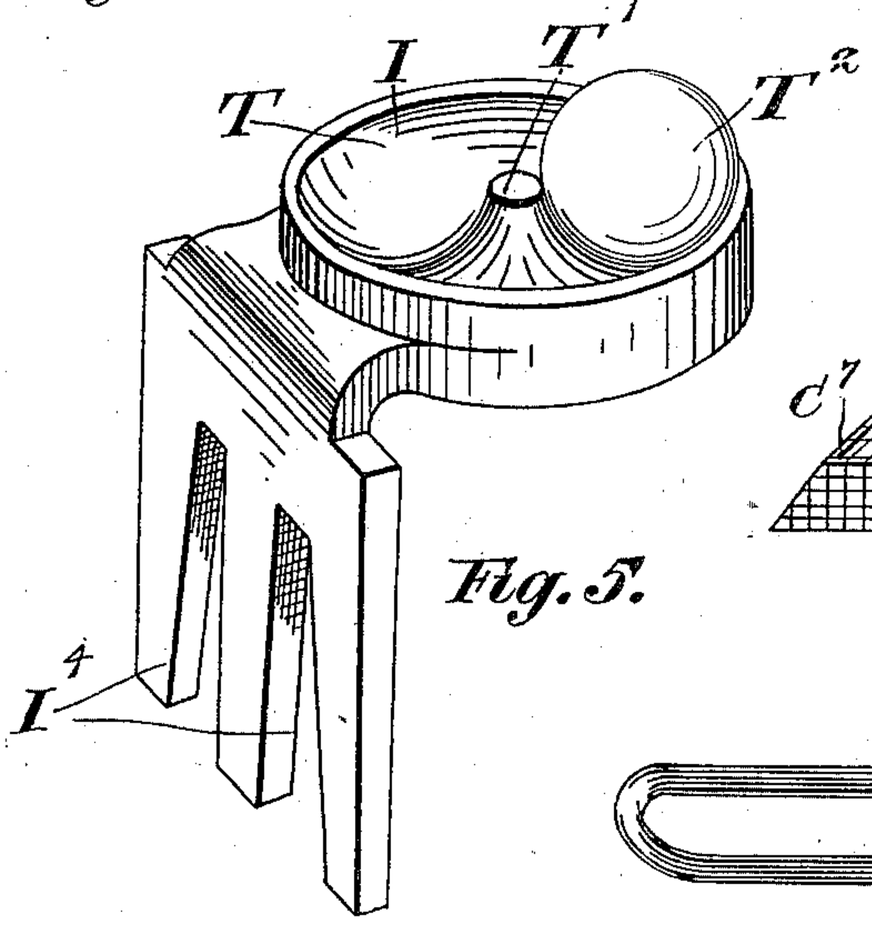

Fig. 5.

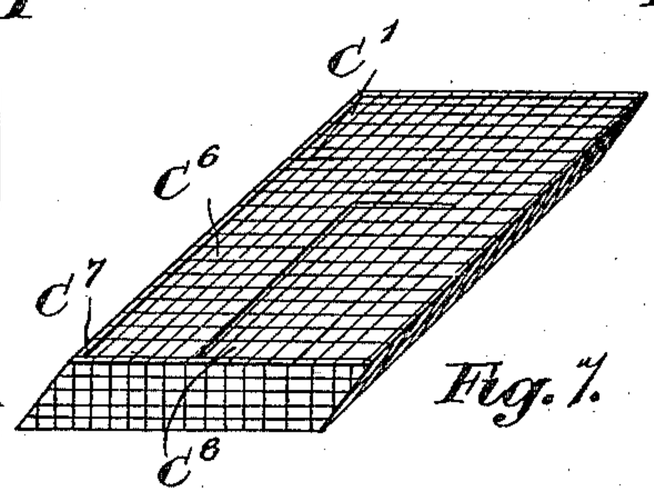

Fig. 7.

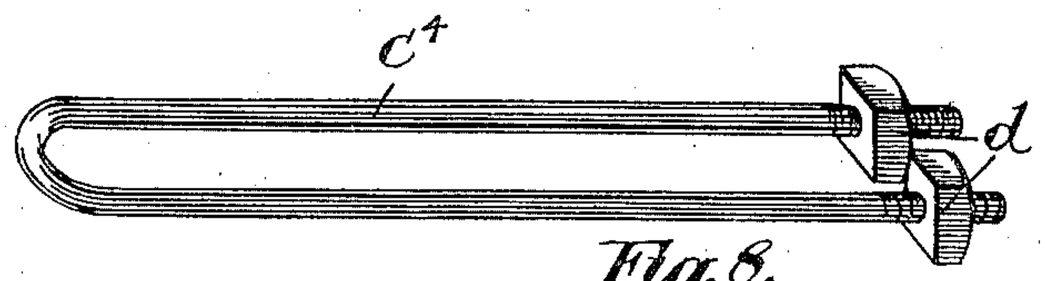

Fig. 8.

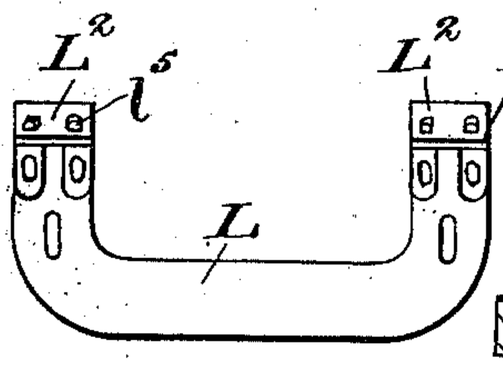

Fig. 11.

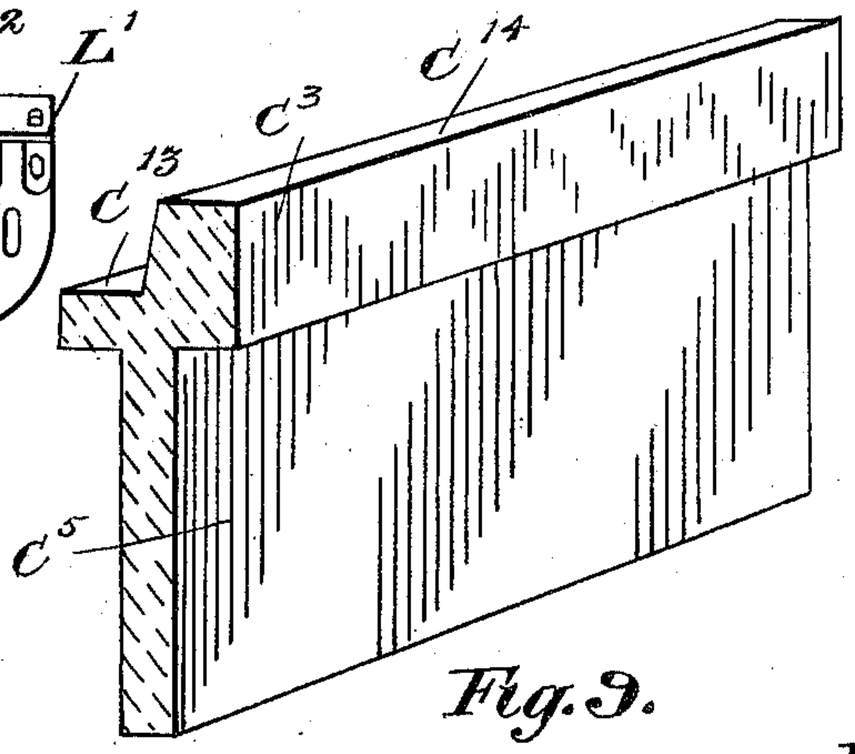

Fig. 9.

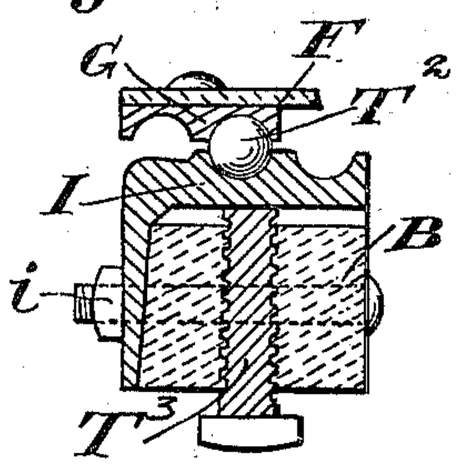

Fig. 12.

Witnesses.
L. C. Reynolds.
J. M. Ferguson

Inventor.
G. Fensom,
by Egerton R. Case,
Atty.

UNITED STATES PATENT OFFICE.

GEORGE FENSOM, OF CHESLEY, CANADA.

FLOUR-BOLTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 687,737, dated December 3, 1901.

Application filed March 15, 1900. Serial No. 8,691. (No model.)

To all whom it may concern:

Be it known that I, GEORGE FENSOM, miller, a subject of the Queen of Great Britain, and a resident of the village of Chesley, in the county of Bruce, Province of Ontario, Canada, have invented certain new and useful Improvements in Flour-Bolting Machines, of which the following is a specification.

My invention relates to improvements in flour-bolting machines; and the object of my invention is to provide a gyrating sieve-frame with a suitable number of separate sieves of particular construction held in tiers in said sieve-frame and securing said sieves in said sieve-frame, so that they can be speedily removed when necessary, and supporting underneath each of said sieves an adjustable drawer in which has operation any well-known form of conveying means for conveying the stock from said drawer to any well-known form of side conveyers suitably secured to one side of the machine, as hereinafter more particularly explained.

Figure 1 is a front side elevation of my machine, comprising two sections. Fig. 2 is a rear side elevation of Fig. 1. Fig. 3 is an enlarged vertical cross-section through the upper section of Figs. 1 and 2. Fig. 4 is an enlarged longitudinal section through the upper section of Figs. 1 and 2. Fig. 5 is a perspective view of the under portion of the ball-bearing bracket with a sphere resting therein used in my machine. Fig. 6 is a perspective view of the upper portion of the ball-bearing bracket. Fig. 7 is an enlarged perspective view of one of the sieves used in my machine. Fig. 8 is a perspective view of one of the staples used for supporting the sieve-supports. Fig. 9 is a perspective view of one of the sieve-supports. Fig. 10 is a vertical section through the yokes in which the break-roll shafts have bearing and supports for same. Fig. 11 is a plan view of the yokes in which the break-roll shafts have bearing. Fig. 12 is a vertical section through one of the ball-bearing brackets, showing supports for same, how the brackets are secured thereto, and means for adjusting the height of said brackets.

In the drawings like characters of reference indicate corresponding parts in each figure.

In the drawings I show the ordinary break-rolls and cabinets used in milling and suitable bearings for the break-roll shafts. I of course lay no claim to these. I can construct my machine of any suitable number of sections and support one above the other in any of the well-known ways.

The cross-conveyer frames A are suitably secured to the side bars B and B′, which are bolted to the standards C. The said cross-conveyer frames A extend underneath the sieve-frames D. The side-conveyer frames E extend the whole length of the machine and are suitably secured to the under side of the cross-conveyer frames A and to the standards C. The sieve-frames D have movement between the standards C C and are supported by means of the bars F, suitably secured thereto, which are provided at their outer ends with the upper portion G of a ball-bearing bracket, bolted thereto at g by means of its lugs g'.

I is the lower portion of the ball-bearing bracket and is bolted at i to the side bars B and B′.

J represents the ordinary cabinets, in which are supported the usual break-rolls K′ and L^{16}.

l' represents the shafts of the break-rolls K′.

l^2 represents the shafts of the break-rolls L^{16}. Secured on the ends of the shafts l^2 are pinions l^3, which mesh with the gear-wheels l^4, secured on the ends of the shafts l'. The standards C C form the supports for the cabinets J, which are suitably secured thereto. J^2 is a spout through which the wheat passes into said cabinet.

K represents brackets which are secured to the standards C C by the screws k. Supported by the brackets K, which are secured to the standards C C in pairs, are yokes L. These yokes extend around the cabinets J and are provided at their ends with bearings L′, in which have bearing the shafts l' and l^2.

L^2 represents caps secured by the screws l^5 to the bearings L′, thus completing the bearings for the shafts of the break-rolls just mentioned. The yokes L are secured to the brackets K by means of the screws L^3, which extend through the slots L^4. The sieve-frames D are composed of two side boards D′ and D^2.

G^3 and G^4 are the end boards of the sieve-frames.

C′ represents a number of sieves which are supported on the tops of the supports C^3, which are held, by means of the staples C^4, embracing their shanks C^5, in place. The staples C^4 are held in the side boards D′ and D^2 of the sieve-frames, as shown, and are secured in position by means of the nuts *d*, screwing onto their threaded ends. These supports C^3, as will be understood, can be quickly taken out and replaced as required. In order to support the sieves C′ horizontally, I preferably construct the top of the supports C^3 with two ledges C^{13} and C^{14}. In any two consecutive supports C^3 the ledge C^{13} of one is on a level with the ledge C^{14} of the other, so it will be clearly understood from the drawings and specification how the sieves C′ are held horizontally. The sieves C′ are constructed as follows:

C^6 is bolting-cloth of any suitable mesh, which is stretched over and suitably secured to a tin frame C^7, which is without a top. The lower portion of this frame is provided with a rectangular slot C^8. The sides of the sieves C′ are preferably constructed at an angle, as will be seen. When the said sieves are placed in position, they are held down by means of tacks C^{11}, secured in the side boards D^2 and D′, so as to abut said sieves. The sieves C′ can of course be secured in place by any suitable means. By so holding the said sieves in the sieve-frames D if one should be broken I can easily remove same from the machine quickly and put another one in its place without any appreciable delay. Around the entire lower edge of the side boards D′ and D^2 and extending a short distance therefrom I suitably secure thereto any suitable packing C^{12}, such as felt, so as to make this portion of the machine dust-proof. Suitably secured on the under side of the side bars B and B′ are boards B^3, which extend the same distance underneath the sieve-frames D, but leave a passage-way B^4 between their inner edges for their entire length. The bars F, which are underneath the cabinets J, are provided with openings *f*″, through which the flour passes from the cabinets. Around the lower end of each cabinet J and on the inside thereof I suitably secure any packing J^3, such as felt. This said felt serves the same purpose as the felt C^{12}, secured to the sieve-frames D. Immediately underneath the opening *f*′ I secure what I call a "break-board" G′, which is suitably secured to the side boards D′ and D^2. I allow the flour passing from the break-rolls or cabinets J to drop upon the break-board G′, as I find that the stock is spread, and, further, there is no danger of breaking said board, as there would be if I used sieves in place thereof. Keyed to one end of the shafts l^2 are pulleys 3 and 4.

13 is an idler-pulley having bearing on the end of the bar 14, bolted to the standards C C. 15 is the drive-shaft, to which is keyed the drive-pulley 16. The power is transmitted from the drive-pulley 16 by the endless belt 17, placed around the pulleys 3 and 4 and idler 13.

I shall now describe the means for operating the several sieve-frames D. Passing up one side of the machine and having bearing in the side bars B′ is a shaft P. This shaft is supported at its lower end by any suitable bearing, which is preferably secured to the floor. Suitably keyed to the shaft P, as by set-screws Q′, and resting upon the side bars B′ are bosses Q^2, which are provided with eccentrics Q^3, having bearing in the cross-bars Q^4, secured by bolts *q* to the side boards D′ and D^2 of the sieve-frame D. Keyed to the shaft P and preferably midway its ends is a pulley Q^5, which is operated by a belt Q^6, driven from any suitable source. It will of course be understood that each sieve-frame D is connected to the shaft P by the same means as those above described. The lower portion I of the ball-bearing bracket is bifurcated, as shown at I^4. T represents ball-races which are formed in both portions of the said ball-bearing bracket. T′ represents conical-shaped raised centers extending from the center of the said ball-races in the manner shown. T^2 is the ball. I lay no claim to this ball-bearing bracket. As will be seen from the drawings, the sieve-frames D are supported at their four corners by the ball-bearing brackets and when such sieve-frames are moved they are given the movement that is ordinarily given to a small hand-sieve. When the sieve-frames D are moved, it will of course be understood that the balls T^3, running in the races T and being between the conical-shaped raised centers T′, will give the sieve-frames the required movement. When it is desired to adjust any portion of the sieve-frames, the nuts on the bolts *i* are loosened and the screw T^3 screwed in, thus raising up the ball-bearing bracket and the sieve-frame the required distance. When the said ball-bearing bracket is adjusted, the nuts on the bolts *i* are of course tightened. The screws T^3 are screwed through the side bars B and B′.

I shall now describe the construction of the cross-conveyers. The drawers H′, forming the cross-conveyers, have the usual sliding bearing in the cross-conveyer frames A. The drawers H′ are considerably longer than the width of the sieve-frames D, and it will be understood that when they are drawn out, (see dotted lines,) so as to discharge the flour into the outer side conveyer, its back board H^3 will not move beyond the inner edge of the board B^3. F^2 represents sprocket-wheels secured to the shafts F^3, which are journaled in the sides of the drawers H′ and near the front end thereof. F^4 represents sprocket-wheels secured to the shafts F^5, which have bearing in the sides of the drawers H′ and near their back board H^3. Each drawer is provided with two sprocket-wheels having separate bearings therein. F^6 is a shaft which has bearing in the cross-conveyer frames A. Secured at the right-hand end of the shaft F^6

is a beveled gear-wheel F^7. Keyed to the shaft F^6, so as to be in alinement with the sprocket-wheels F^3 and F^4 in the drawers H′, are sprocket-wheels F^8. F^9 is an endless chain extending around the several sprocket-wheels in the drawers H′ and over the sprocket-wheel F^8. Suitably secured to the chains F^9 are a number of scrapers f^2, which convey the flour in the right direction. Held in suitable bearings F^{10}, suitably secured to the side conveyers E, is a shaft F^{11}. Keyed to this shaft is a beveled gear-wheel F^{12}, which meshes with the beveled gear-wheel F^7. Also keyed to the shaft F^{11} is a beveled gear-wheel F^{13}, which meshes with the beveled gear-wheel F^{14}, keyed to the shaft F^{15}, held in suitable bearings in the partitions F^{16} of the side conveyers E. Each end of the side conveyers E is provided with shafts F^{15}. Each of the inner side conveyers F^{18}, middle conveyers F^{19}, and outer conveyers F^{20} are provided with sprocket-wheels F^{21}, which are keyed to the shafts F^{15}. Extending around the sprocket-wheels F^{21} are chains F^{22}, which are provided with scrapers f^4. The shaft F^{11} and its connecting parts are driven by the belt F^{23}, extending around the pulley F^{24}. The flour-spout I^2, suitably secured near the side of the side conveyers E, is fed by small spouts I^3, which convey the flour from the said side conveyers into the spout I^2 and thence to any suitable packer. Suitably secured, as by hinges f^5, to the side bars B are covers A^2, which inclose the cross-conveyers and side conveyers, as will be seen.

Having now described the principal parts involved in my invention, I shall describe the operation of same.

The drive-pulleys 16 Q^5 F^{24} are driven from any suitable source. The shaft F^{11}, being revolved by the pulley F^{24}, by means of its gearing operates the shafts F^6 and F^{15} and their several sprocket-wheels secured thereto. This consequently moves the chains F^9 and F^{22} in the direction indicated by arrows, conveying the flour to the required conveyer. It will of course be understood that the "conveyer-chains" used throughout my machine (which I shall now call them) are moved in the same direction in their respective conveyers. On reference to Fig. 3 it will be seen that the scrapers f^4 of the conveyer-chains F^{22} rest upon the supports f^6, secured to the partitions F^{16} of the side conveyers E. This, it will be seen, prevents the chains from sagging. The drive-pulley 16 revolves in the direction indicated by arrow, and by means of the belt 17 revolves the pulleys secured to the shafts l^2 in the direction indicated by arrows, and by means of the pinions l^3 and gear-wheels l^4 operate the break-rolls in the cabinets. When the shaft P is revolved, the eccentrics Q^3, keyed thereto, revolve in their bearings in the cross-boards Q^4. This, it will be seen, moves the several sieve-frames D, and on account of the said ball-bearing brackets before described they are given the gyrating movement before referred to. Commencing with the cabinet J′, the wheat after entering thereinto through the spout J^2 is ground and drops onto the break-board G′, and by the movement of the sieve-frame D is scalped over the several sieves C′, each sieve, of course, carrying off the flour as the stock is scalped over same. On account of the sieves being placed in tiers, as soon as the stock has passed from one sieve onto the next one below it it cannot, as will be understood, during the backward movement of the sieve-frame be scalped onto the sieve it came from, and consequently is forced to travel from the highest sieve down to the lowest. It will of course be understood that the movement given to the sieve-frames D is such as will not cause the path of movement of the rectangular openings C^8 of the sieves C′ to be outside the receptive area of the cross-conveyers underneath said sieves. The stock which does not pass through the sieves C′ passes from the last or lowest sieve, through the passageway G^2, Fig. 2, into the cabinet J^4, where it is further ground. The stock then passes onto the sieves in the next section of the machine and the flour separated therefrom, as before described. This operation can of course be carried on as often as desired. The mesh of the sieves C′ may be such as will permit middlings to pass therethrough, preferably near the lower end of the sieve-frame. These middlings will be received by a suitable number of the cross-conveyers or drawers H′ and conveyed to the required side conveyer, thence can be conveyed in any of the well-known ways to the desired break-rolls and ground, and then passed over the sieves C′ in the required sieve-frame. The middlings will thus be reground when I use several sections in my machine.

As shown in the drawings, each section is provided with standards C, which can be bolted to the standard of the succeeding section, as shown at *x*.

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

1. In a flour-bolting machine, the combination with the break-rolls operating in the usual cabinets which are suitably supported, the said rolls being held in suitable bearings, standards of said mill to which said bearings are secured, means for driving said break-rolls, side supports for said mill secured to said standards, and conveyers held underneath said break-rolls comprising cross-conveyer frames secured to said side supports and extending across the whole width of the mill, adjustable drawers held in said cross-conveyer frames, and conveying means operated in each of said drawers, of a sieve-frame supported at each corner by said side supports, between said break-rolls and said drawers, comprising a longitudinal frame, separate horizontally-held sieves held in tiers in said frame, corresponding to the number of said adjustable drawers, each sieve being

held immediately above its corresponding adjustable drawer and having movement sufficient so as not to be moved beyond the receptive area of its adjustable drawer; commencing with the top one, each succeeding sieve being a certain distance below and abutting against the preceding sieve and extending its width in advance of said preceding sieve, and a suitably-operated eccentric secured in said sieve-frame for giving the same a gyratory motion, as and for the purpose specified.

2. In a flour-bolting machine, the combination with the standards, side supports secured to said standards, and a suitable longitudinal sieve-frame supported at each corner on said side supports, of cross-conveyer frames A secured to said side supports and underneath said longitudinal sieve-frame, adjustable drawers having bearing in said cross-conveyer frames, the said cross-conveyer frames being longer than the width of said machine and extending beyond one side only of said machine, and a side conveyer secured to the extended portion of said cross-conveyer frames and underneath the discharge end of said adjustable drawers, as and for the purpose specified.

3. In a flour-bolting machine, the combination with the standards C, C, bars B and B′ bolted to said standards, and the sieve-frame D comprising a longitudinal frame supported at each corner on the said bars, a number of horizontally-held sieves held in tiers in said sieve-frame; commencing with the top one, each succeeding sieve being a certain distance below and abutting against the preceding sieve, and extending its width in advance of the preceding sieve, and an opening at the lower end of said sieve-frame, of the cross-conveyer frames secured to said bars, the said cross-conveyer frames being longer than the width of said machine and extending beyond one side thereof, adjustable drawers having bearing in said cross-conveyer frames and corresponding in number to the said sieves, each sieve being held immediately above its corresponding adjustable drawer, and a side conveyer secured to the extended portion of said cross-conveyer frames and underneath the discharge end of said adjustable drawers, as and for the purpose specified.

4. The combination with the sieve-frame provided with an opening at its lower end, staples C^4 held in tiers in said frame, supports C^3 held in tiers by said staples, and the break-board G′, of a number of sieves held by said supports in tiers, in said sieve-frame, as and for the purpose specified.

5. In a flour-bolting machine, the combination with the standards thereof, bars B and B′ bolted to said standards, and boards B^3 secured to the under side of said bars B and B′, the said boards extending lengthwise of the machine from standard to standard and having a passage-way between their inner edge for their whole length, of a longitudinal sieve-frame supported at each corner on said bars above said boards and having movement between said standards, horizontally-held sieves held in tiers in said sieve-frame; commencing with the top one, each succeeding sieve being a certain distance below and abutting against the preceding sieve and extending its width in advance of the preceding sieve, an opening at the lower end of said sieve-frame, an eccentric secured in said sieve-frame for giving the same a gyratory movement, means for operating said eccentric, cross-conveyer frames secured to said bars and underneath said sieve-frame, the length of said cross-conveyer frames being longer than the width of said machine and extending beyond one side only of said machine, adjustable conveyers held in said cross-conveyer frames, the said adjustable conveyers corresponding in number to the said sieves, each sieve being held immediately above its corresponding adjustable conveyer, and a side conveyer secured to the extended portion of said cross-conveyer frames and underneath the discharge end of said adjustable conveyers, the said side conveyer extending lengthwise of the machine, as and for the purpose specified.

6. In a flour-bolting machine, the combination with the standards C, C, bars B and B′ bolted to said standards, cross-conveyer frames secured to said bars, the length of said cross-conveyer frames being longer than the width of said machine and extending beyond one side only of said machine, adjustable conveyers having bearing in said cross-conveyers, and the side conveyers secured to the extended portion of said cross-conveyer frames and underneath the discharge end of said adjustable conveyers and extending lengthwise of the machine, of the covers A^2 hinged to the bars B, all arranged, as and for the purpose specified.

In witness whereof I have hereto affixed my signature to this specification in the presence of two witnesses.

GEORGE FENSOM.

Witnesses:
C. J. MICKLE,
F. J. LITTICO.