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W. M. LUCAS.

FLOUR BOLT.

No. 383,062. Patented May 15, 1888.

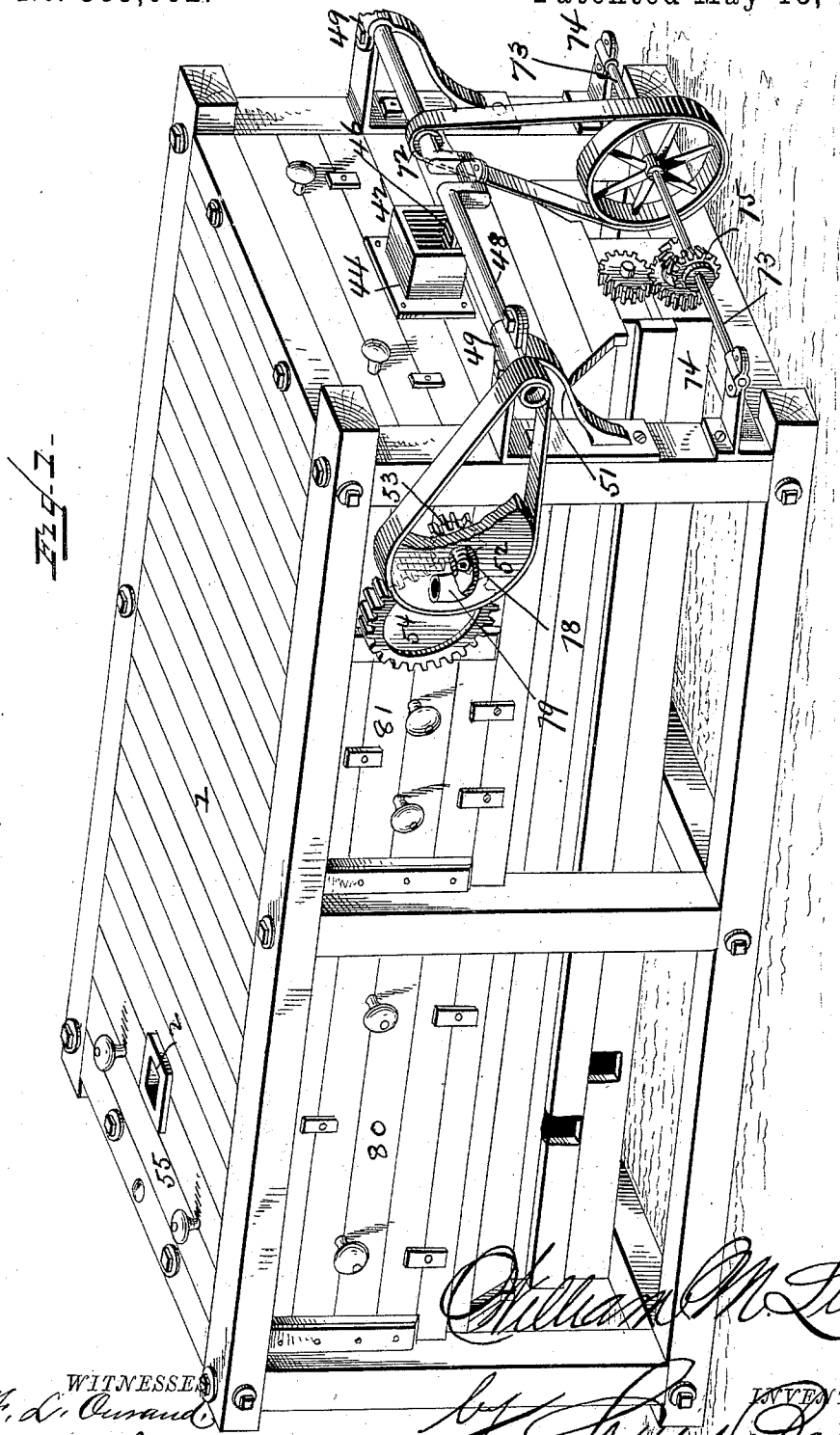


Fig. 1.

WITNESSES:

F. L. Durand.

Benj. F. Cowl.

William M. Lucas.

INVENTOR.

by Lucas Dagger & Co.

Attorneys.

N. PETERS. Photo-Lithographer. Washington, D. C.

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Fig. 2.

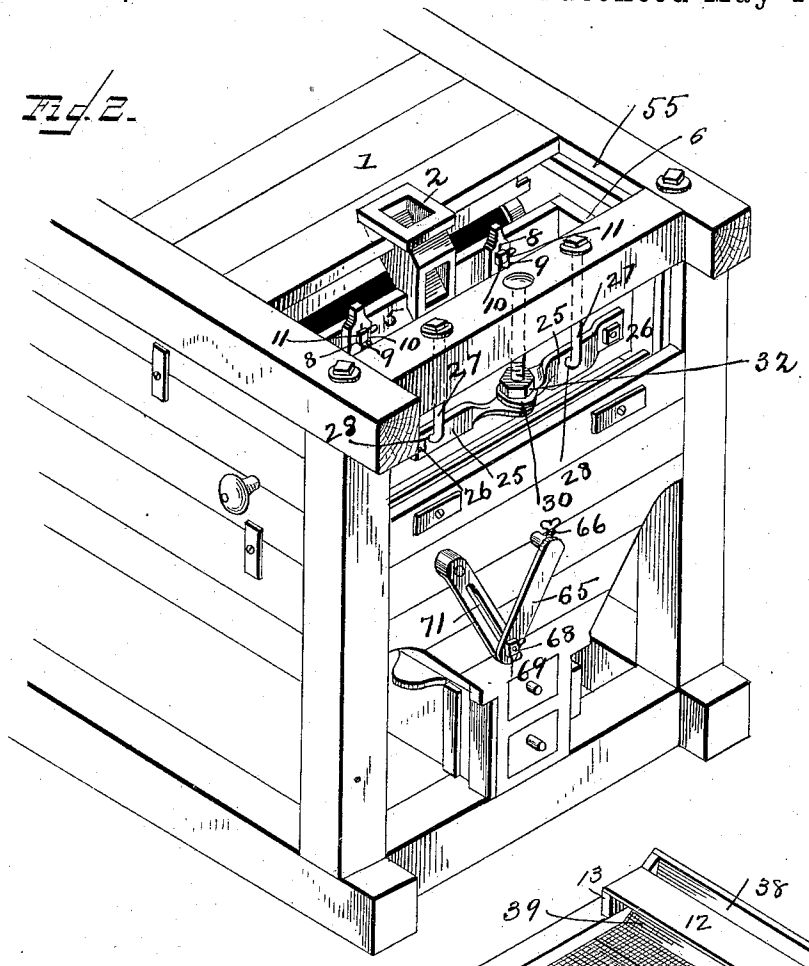
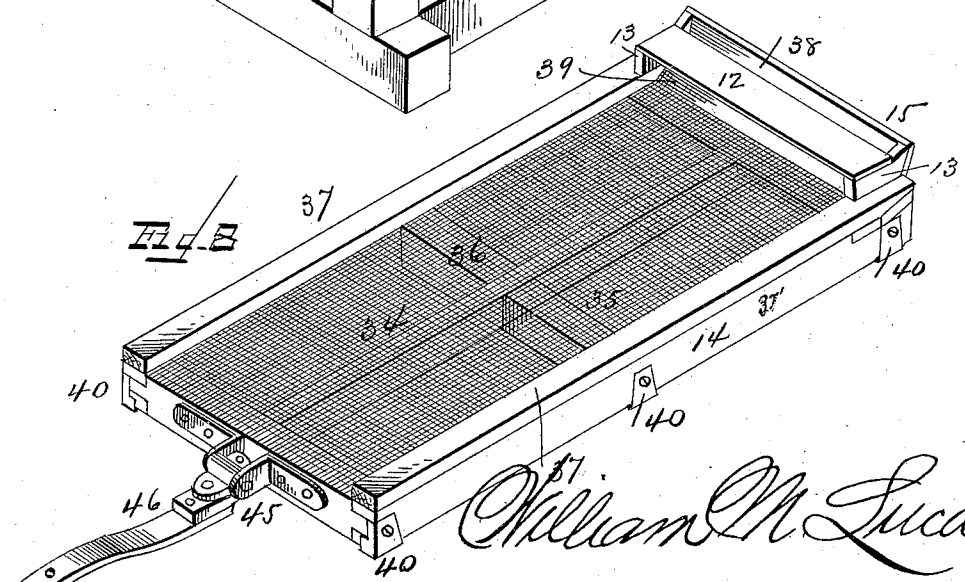


Fig. 3.



WITNESSES

F. L. Ourand.

Benj. F. Cowl.

William M. Lucas,

INVENTOR.

by Louis Bagger & Co.

Attorneys.

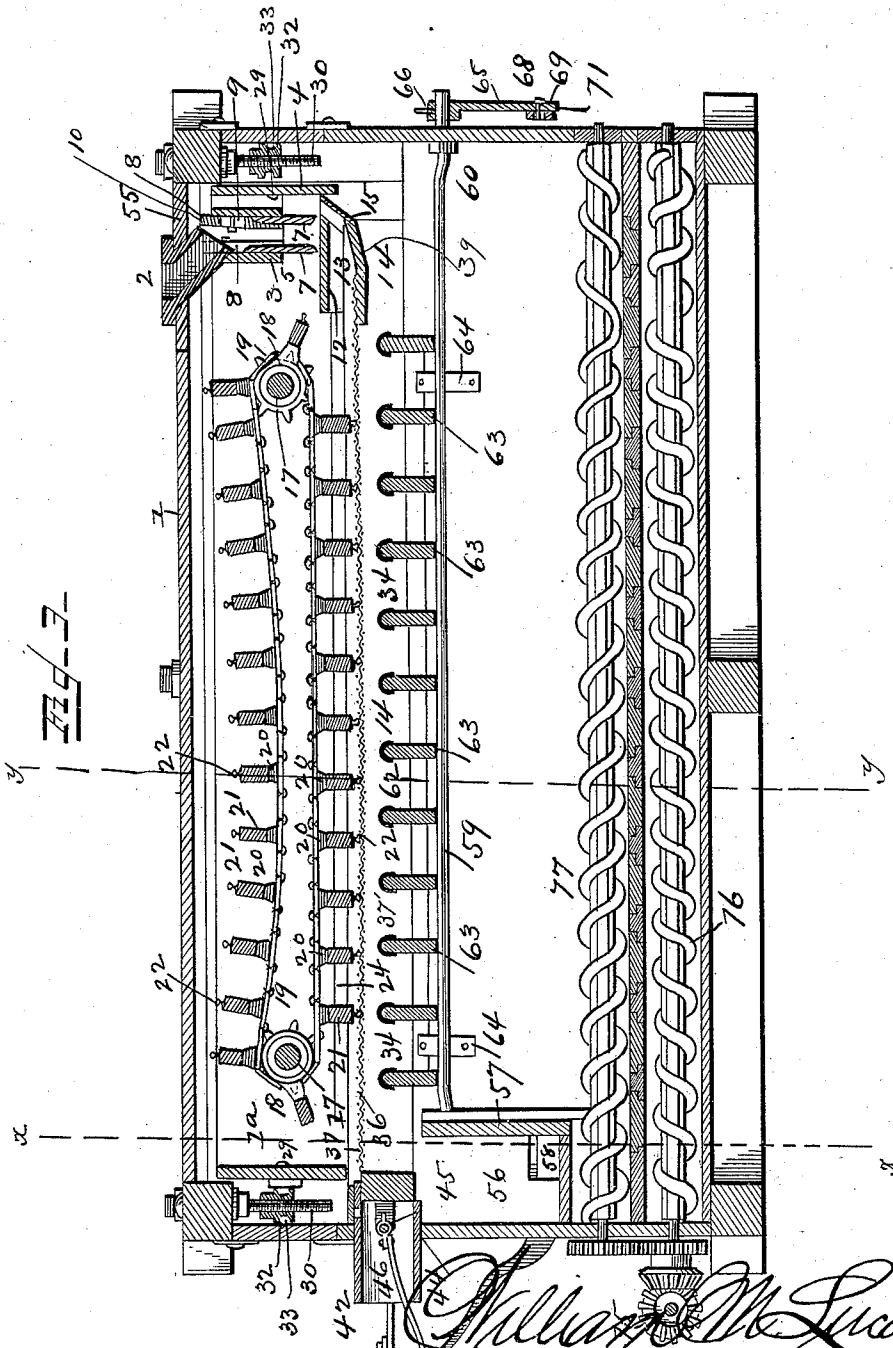
N. PETERS. Photo-Lithographer, Washington, D. C.

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W. M. LUCAS.

FLOUR BOLT.

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WITNESSES.

F. L. Ourand.

Benj. F. Cowl.

William M. Lucas,

INVENTOR.

by Louis Bagger & Co.

Attorneys.

N. PETERS, Photo-Lithographer, Washington, D. C.

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FLOUR BOLT.

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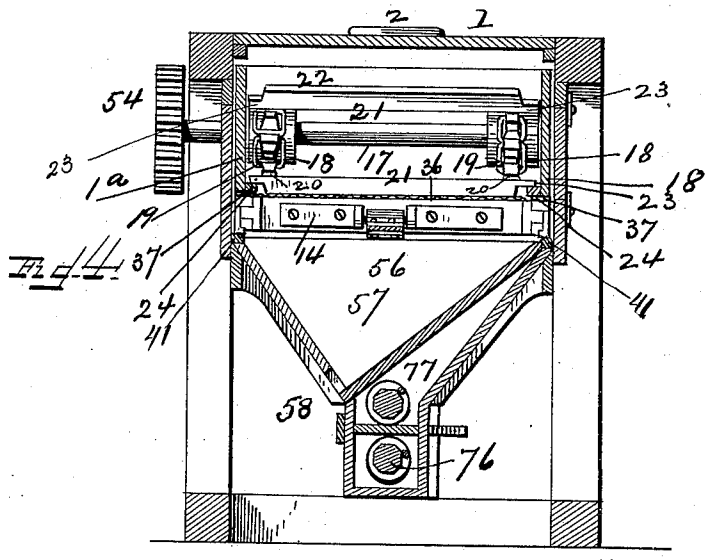


Fig. 4.

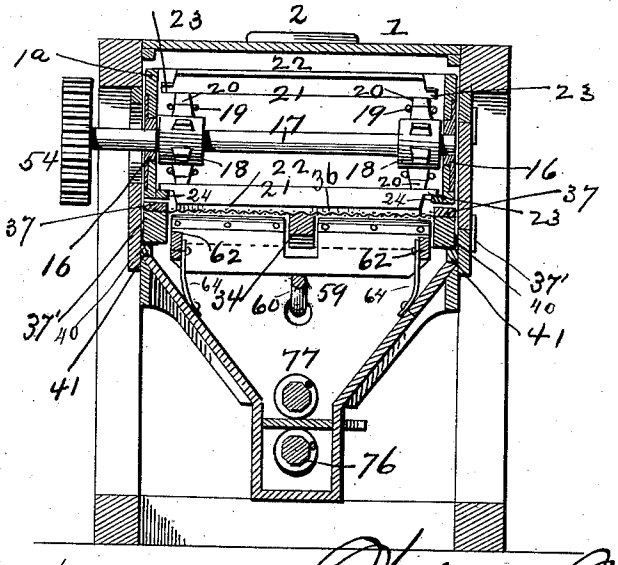


Fig. 5.

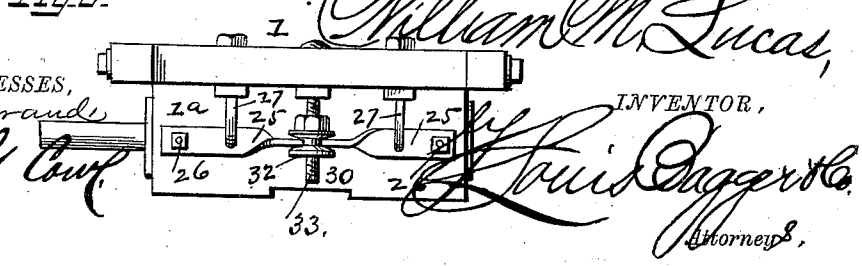


Fig. 6.

WITNESSES,
F. L. Ourand
Benj. H. Cook

INVENTOR,
William M. Lucas,
by Louis Bagger & Co.
Attorneys.

N. PETERS, Photo-Lithographer, Washington, D. C.

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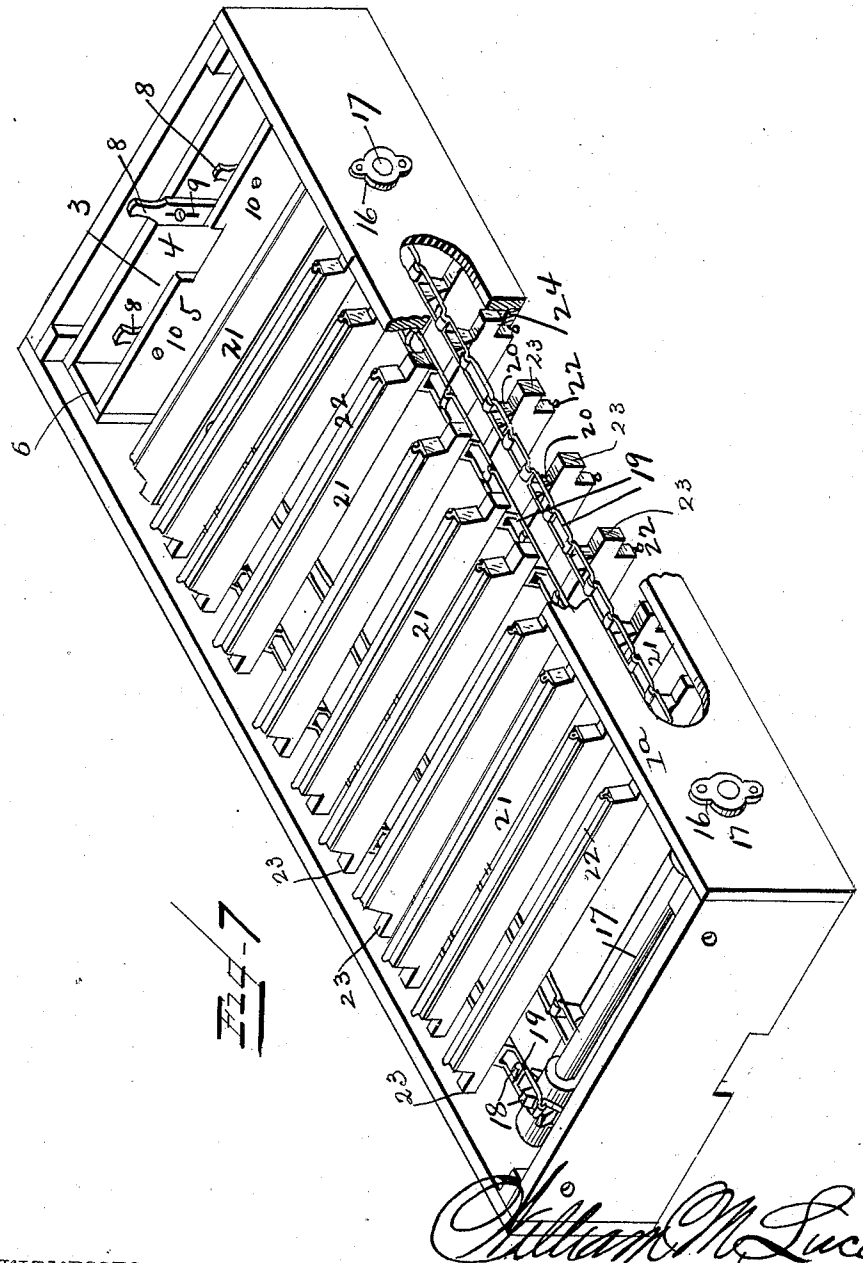


Fig. 7.

WITNESSES.

F. L. Ousand.

Benj. F. Cowl.

William M. Lucas.

INVENTOR.

by Louis Bagger & Co.

Attorneys.

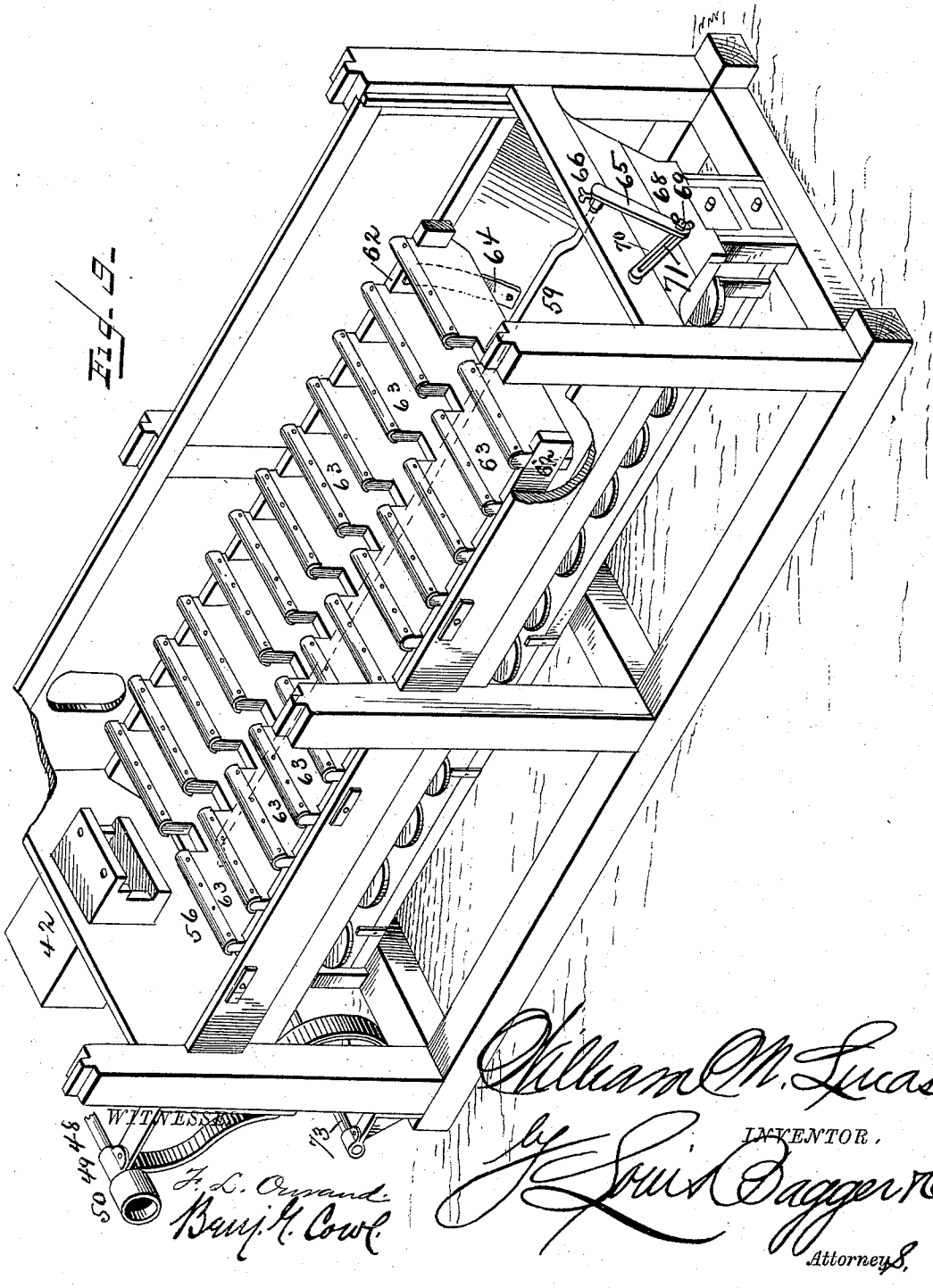
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W. M. LUCAS.

FLOUR BOLT.

No. 383,062. Patented May 15, 1888.



N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM M. LUCAS, OF UHRICHSVILLE, OHIO.

FLOUR-BOLT.

SPECIFICATION forming part of Letters Patent No. 383,062, dated May 15, 1888.

Application filed August 18, 1887. Serial No. 247,319. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. LUCAS, a citizen of the United States, and a resident of Uhrichsville, in the county of Tuscarawas and State of Ohio, have invented certain new and useful Improvements in Flour-Bolts; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a perspective view of my new and improved flour-bolt. Fig. 2 is a perspective view of the opposite end to that from which Fig. 1 is taken, the end lid of the top of the outer casing being removed. Fig. 3 is a longitudinal vertical central sectional view of the entire machine. Fig. 4 is a vertical transverse sectional view taken on the plane indicated by line *x x* of Fig. 3. Fig. 5 is a transverse vertical sectional view taken on the plane indicated by line *y y* of Fig. 3. Fig. 6 is an end view of the carrier-frame, showing the device for adjusting the same. Fig. 7 is a detail view of the carrier-frame and carriers. Fig. 8 is a perspective detail view of the flat screen, and Fig. 9 is a perspective view showing the cleaners in position within the machine-casing.

The same numerals of reference indicate corresponding parts in all the figures.

The object of my invention is the production of a machine which will rapidly and effectively bolt flour through a flat and level sieve; and to this end my invention consists in the new and improved construction, arrangement, and combination of parts of a flour-bolt, which will be hereinafter fully described and claimed.

Referring to the several parts by their designating-numerals, 1 indicates the top of the outer casing, and 1^a the frame in which the feed-box and carriers are fastened. Near one end of this top frame, 1, is the inclined feed-spout 2, through which the material passes into the machine to be bolted. The lower end of this inclined feed-spout opens into the feed-box 3, of which 4 is the back, 5 the front, and 6 6 the ends, respectively. As the material passes through the spout 2, it is received in the feed-box 3. To the inner side of the longitudinal front and back of the feed-box are adjustably secured the spreading-boards 7 7, which are secured to the adjusting hangers or blocks 8 8 8, which are formed with the longitudinal vertical slots 9 9 9, through which pass the bolts 10, which are threaded on their inner end portions for the reception of the thumb-nuts 11, by tightening which the spreading-boards are secured in their adjusted positions, the said spreading-boards being readily adjusted by their slotted blocks 8 8 8, when the thumb-nuts 11 are loosened and fastened at the point to which they are adjusted by screwing tight the said thumb-nuts. As the material passes through the spout 2, it enters the feed-box 3, and, passing between the spreading-boards 7 7, falls upon a feed-board, 12, which is secured upon blocks 13 13, which are fastened to that end of the sieve-frame 14, which will be hereinafter more fully described, and as this flat sieve is reciprocated back and forth by the mechanism hereinafter described it carries the material out under the spreading-boards 7 7 in a thin and even sheet. At this end of the flat sieve, back of the feed-board 12, is arranged the inclined guard-board 15, which prevents the material from dusting out at that end of the sieve.

1^a indicates the frame in which the feed-box and also the carriers are secured. In the sides of this frame, toward the ends of the same, are arranged the bearings 16, in which are journaled the transverse shafts 17, upon which are rigidly keyed, within the frame 1^a, the sprocket-wheels 18, around which pass the sprocket-chains 19 19, and each alternate link of this link belting is formed with an outwardly-extending solid central plate or bearing, 20, to which are secured by screws or rivets the wooden cross strips 21, on the outer edges of which are tacked or otherwise secured the strips 22, of cloth or other yielding material, which comes into direct contact with the upper flat surface of the sieve-cloth. Each end of each wooden strip 21 is notched or cut away to form a shoulder and a projection, 23, and the said notched ends slide upon hard-wood strips 24 24, which are secured to the inner lower sides of the frame 1^a.

The frame 1^a is secured adjustably to the top part, 1, of the machine by arms 25 25 at each of its ends, the outer ends of the said

arms being bolted to the outer sides of the ends of the frame 1^a by the pivot-bolts 26 26, while the said arms are centrally secured pivotally upon the lower ends of bolts 27 27, which project down from the ends of the top frame, 1, and the lower threaded ends of which bolts are bent in at right angles, and these bent ends pass through central apertures, 28 28, in the arms 25 25, and the arms are retained upon the bolts by the nuts 29 29. A long threaded bolt, 30, projects down from each end of the top 1 midway between the bolts 27 27, and upon each of the said bolts 30 works an adjusting-nut, 32, which is formed with an annular groove, 33, and in this annular groove fits the inner ends of the arms 25 25. Now it will be seen that by screwing the grooved nuts 32 up or down the inner ends of the centrally-pivoted arms 25 25 at each end of the frame 1^a can be raised or lowered, and their outer ends, which are bolted to the ends of the frame 1^a, accordingly lowered or raised, and it will be seen that by this means the carriers can be raised or lowered nearer to or farther from the sieve, so as to carry the material faster or slower along the sieve, as may be desired by the operator of the machine, thus preventing the material from clogging, adjusting the speed according to the condition of the material to be bolted.

14 indicates the frame of my new and improved flat sieve, this rectangular frame having the central longitudinal brace, 34, and the transverse brace 35, which prevents the frame from springing together when the sieve-cloth 36 is spread and secured upon it. This flat sieve-cloth is spread and secured upon the frame 14 and held more firmly by the side strips, 37 37, which are fastened upon the longitudinal edges of the side pieces 37′. This gives a perfectly flat and level bolting-surface. Upon blocks 13 13, upon what may be called the "forward end" of the sieve, is secured the feed-board 12, previously referred to, and back of this feed-board, at the extreme end of the frame, is secured the inclined guard-board 15, which extends up, as shown, and between which and the rear longitudinal edge of the feed-board a space, 38, is left, through which the flour from that side of the feed-board falls, and the flour falling through this space falls upon an inclined board, 39, which forms that end of the bottom of the sieve-frame, and, owing to the inclination of this bottom board, 39, as the sieve is reciprocated, the flour falling upon it will be fed out upon the sieve-cloth, where the carrier-strips can come in contact with it and move it forward along the sieve. In the side pieces or bars 37′ of the sieve-frame are secured the metal bearing-blocks 40, the lower ends of which extend a short distance down below the lower edge of the side piece of the frame, these metal blocks forming bearing-slides which run upon hard-wood tracks 41, which are secured in the side walls of the main machine-casing, as shown, this arrangement greatly reducing the friction between the screen or sieve and the supporting-tracks, as will be readily understood.

To the rear end of the sieve-frame is secured the boxing 42, which extends through an opening, 44, in that end of the machine-casing, so as to prevent the dust from escaping, as the said box, square in cross-section, will completely close the opening through which it slides, its inner end being closed, and within the inner end of this box extends a cross-head, 45, which is secured to that end of the sieve-frame. This cross-head is pivotally connected by a pitman, 46, with the pin 47 of the drive crank-shaft 48, which is supported in bearings 49 49 at that end of the machine, and on one end of this drive-shaft is secured a drive-pulley, 50, around which the drive-belt from the source of power passes, to which, upon the other end of the drive-shaft, is secured a smaller pulley, 51, around which passes a belt to a large pulley, 52, the hub of which is formed with a pinion, 53, which in turn meshes with a gear-wheel, 54, on that projecting end of the forward shaft, 17, of the spreader-frame; and it will thus be seen that as the drive-shaft is revolved it will reciprocate the sliding sieve and at the same time operate the endless carriers.

In operation the flour, which is fed into the machine through the feed-spout 2, passes through the feed-box 3 between the spreading-boards 7 7 of the same, which have been adjusted to the desired point, (the top of that end of the casing being provided with the removable lid 55, which can be removed to adjust the spreading-boards conveniently,) and down upon the feed-board 12, and as the sieve is being continually reciprocated back and forth the said feed-board carries the material out from under the spreading-boards in a thin and even sheet upon the sieve. The traveling carrier-strips here come in contact with the material, having been raised or lowered to the required point, as before described, according to the condition of the material. The constantly-moving carriers thus catch the flour as it is fed upon the forward end of the sieve-cloth in an even and thin stream or sheet and carry it from the feed-box to the other end of the sieve-cloth, and the fine flour will thus be separated from the coarse, which latter passes off, in the usual manner, over the rear end of the sieve-frame into the space 56 between the end wall of the outer casing of the machine and a vertical partition, 57, and falls down the inclined sides of the bottom part of the outer casing until it runs out through the opening 58. The fine flour, under the action of the carriers, passes through the cloth of the sieve.

59 indicates an adjusting-rod, which extends longitudinally within the machine beneath the sieve, being journaled at its inner end in the vertical partition 57, and extending through a bearing in the opposite end of the machine-casing, while a collar, 60, secured upon it toward its outer end, prevents it from slipping and holds it in position. This rod extends in

its bearings along the center of the machine, and just inside of the casing is bent up so that its main central portion is out of line with its ends which support it in the bearings. Upon this central longitudinal rod is supported adjustably the cleaner, which consists of the side pieces 62 62 and the series of cross bars or slats 63, arranged in vertical planes, and upon the upper edges of these bars or slats are secured covering-strips of cloth or other suitable yielding material. This cleaner-frame is held in place adjustably by the leather straps 64, as shown, and is guided in its vertical movements by the side bars or pieces of the sieve-frame. Upon the projecting outer end of the rod 59 is secured by means of a set-screw, 66, an arm, 65, in the outer end of which is secured an inwardly-projecting pin or bolt, 68, which is secured by the thumb-nut 69, and this headed bolt passes through the longitudinal slot 71 of an arm, 70, which is pivoted at its upper end upon the end of the machine-casing, as shown. Now it will be seen that when the thumb-nut 69 is loosened the arm 65 can be turned up or down and secured in its adjusted position by tightening the said thumb-nut 69, and by raising this arm 65 the eccentric-rod 59 will be raised within the machine, so as to raise the cloth-cleaner into contact with the lower side of the sieve-cloth, the vertical cleaner-bars being centrally recessed on their upper edges, to prevent their coming into contact with the central longitudinal brace of the sieve-frame, and as the sieve-frame vibrates or is reciprocated the cloth on the upper edges of the vertical cleaner-bars will rub against the lower face of the sieve-cloth, which will keep the sieve-cloth clean and prevent its clogging with warm and soft material, as will be readily understood. It will be seen that by this construction and arrangement, while the machine is in operation, the eccentric-rod 59 can be raised in a moment by its end arm, so as to bring the cloth-covered upper edges of its bars into contact with the lower surface of the sieve-cloth, when, as the sieve reciprocates, the cloth will be kept clean and prevented from clogging, while the cleaners can be lowered when desired, so as to put them out of operation.

Upon the drive crank-shaft is a small pulley, 72, around which passes a drive-belt to a counter-shaft, 73, which is supported in bearings 74 near the bottom of the machine, and this counter-shaft, through gear-wheels 75, drives the conveyers 76 77, which, with their fixtures, are of the ordinary construction.

The pulley 52 is mounted on a hollow pin, 78, and is retained on the same by the small oil-cup 79, which is screwed on the threaded outer end of the said pin. The sides and ends of the machine-casing are preferably formed with the removable doors 80 and 81, by opening which ready access can be obtained to the interior mechanism of the machine.

From the foregoing description, taken in connection with the accompanying drawings, the construction, operation, and advantages of my invention will be readily understood. It will be seen that my new and improved flour-bolt is simple, strong and durable in construction, and exceedingly efficient in its operation. Its several parts can be readily and easily adjusted. The material passes in through the feed-spout into the feed-box, between the adjustable spreading-boards and upon the feed-board of the sieve, and is fed in a thin and even sheet out upon the sieve, where the carriers seize it and carry it to the other end of the sieve, where the chop escapes, while the fine flour passes through the sieve, and the lower side of the sieve-cloth is kept clear by the adjustable cleaners, and the fine flour passes down into the lower part of the machine-casing and into the conveyers, which convey it to the bottom discharge of the machine in the usual manner. By constructing the parts as described it will be seen that the crank will have a very long stroke, which gives the sieve a great capacity and enables it to be run much slower than the ordinary vibratory bolt.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. The combination of the outer casing, a reciprocating sieve, a cleaning-frame below the sieve, the upper portion of which is between the side bars of the sieve and is guided in its vertical movements thereby, a bent shaft below the frame, and the leather straps secured to the frame and to the sides of the casing.

2. The combination of a casing, a partition in one end of the casing, a reciprocating sieve, one end of which projects over the partition, a frame below the sieve, the upper portion of which is between the side bars of the sieve and is guided in its vertical movement thereby, and a bent shaft, one end of which is journaled in the partition and the other end in the casing.

3. The combination of a reciprocating sieve, a cleaning-frame below the sieve, the upper portion of which is between the side bars of the sieve and is guided in its vertical movements thereby, a bent shaft below the frame, a slotted arm secured to one end of the casing, and an adjusting-arm secured at one end to one end of the shaft and at the other end to the slotted arm.

4. The combination of an outer casing, a frame, two arms pivotally secured at their outer ends to the frame, a grooved nut engaging with the inner ends of said arms, a screw-threaded bolt secured to the top of the casing, and a pair of bolts secured to the top of the casing, and having their lower ends bent and secured to the central portions of said arms.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

WILLIAM M. LUCAS.

Witnesses:
T. D. HEALEA,
W. B. STEVENS.