

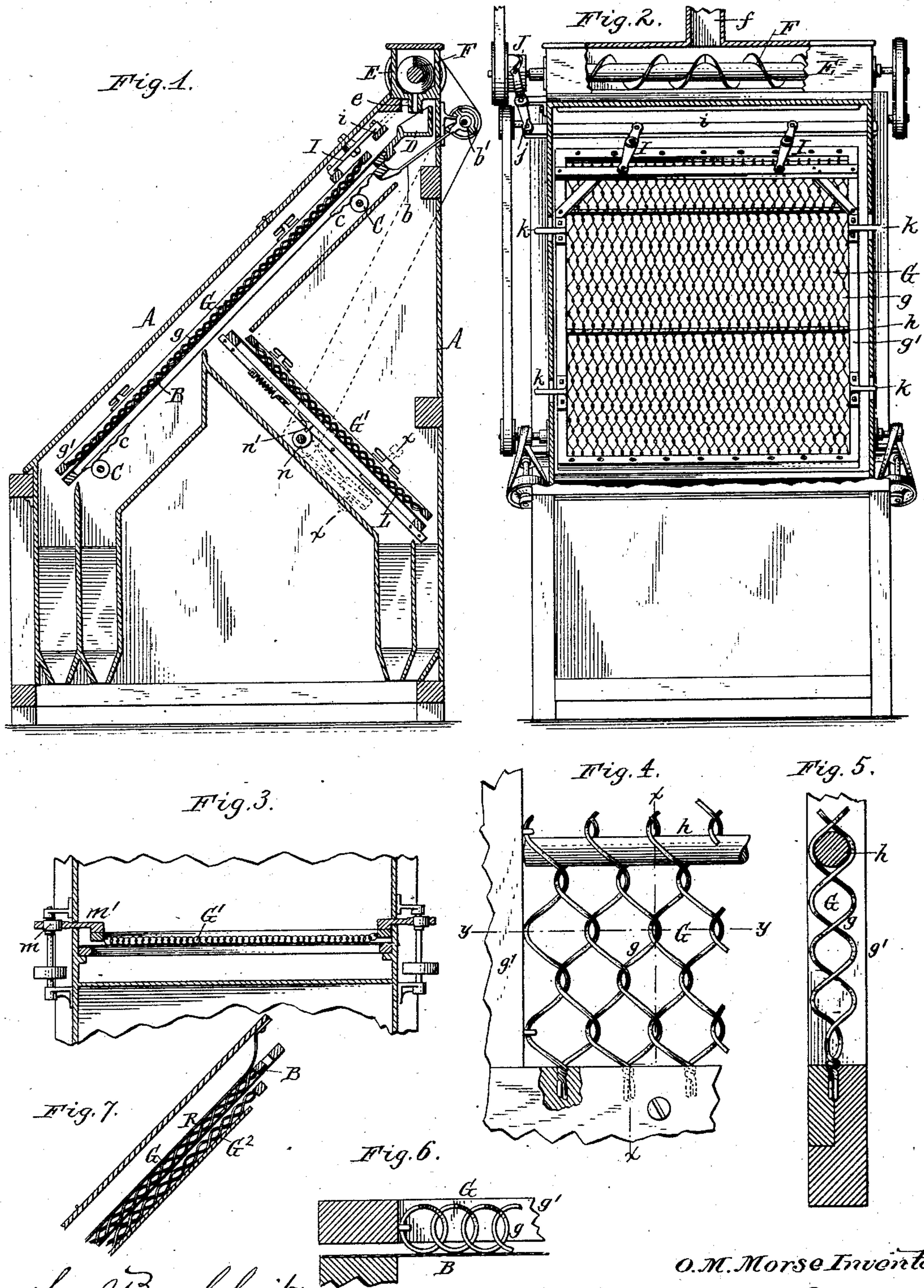
(No Model.)

2 Sheets—Sheet 1.

O. M. MORSE.  
FLOUR BOLT.

No. 374,490.

Patented Dec. 6, 1887.



Chas. J. Buchheit  
Geo. J. Buchheit  
Witnesses.

O. M. Morse Inventor.  
By Wilhelm H. Bonnet,  
Attorneys.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 11.

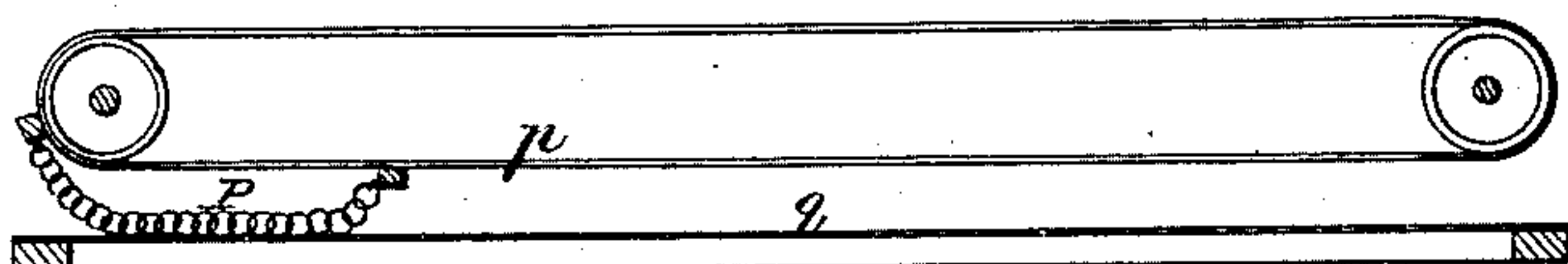


Fig. 9.

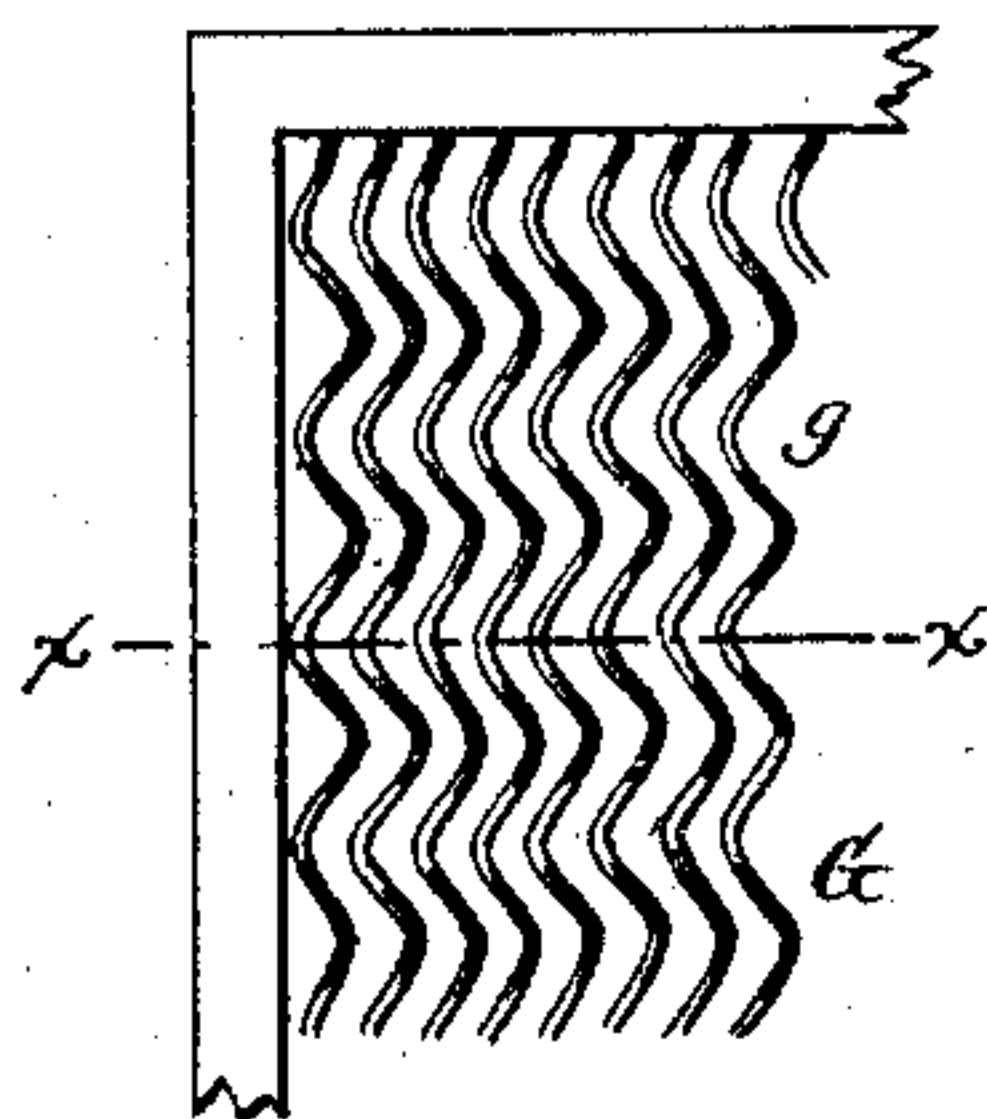


Fig. 8.

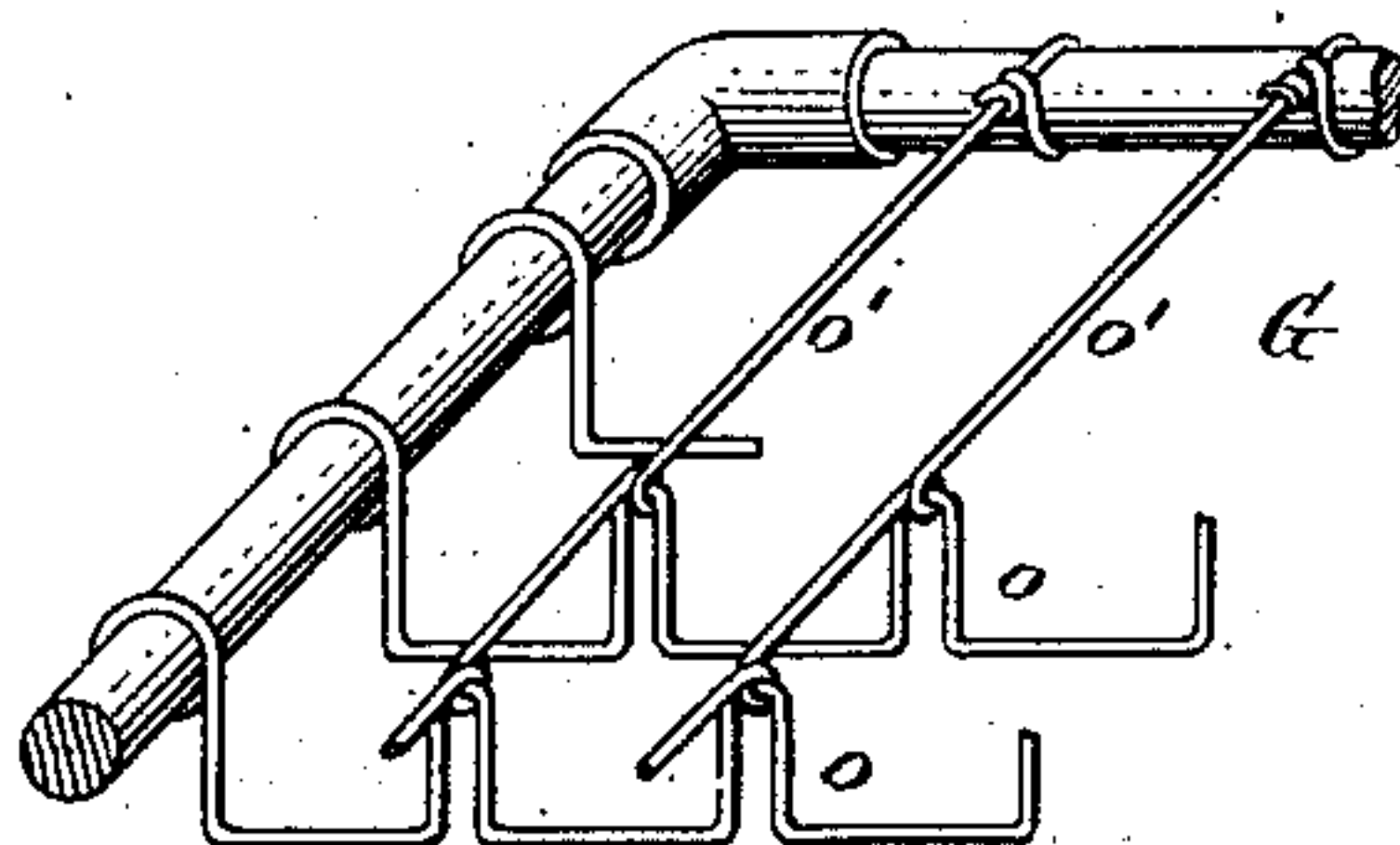
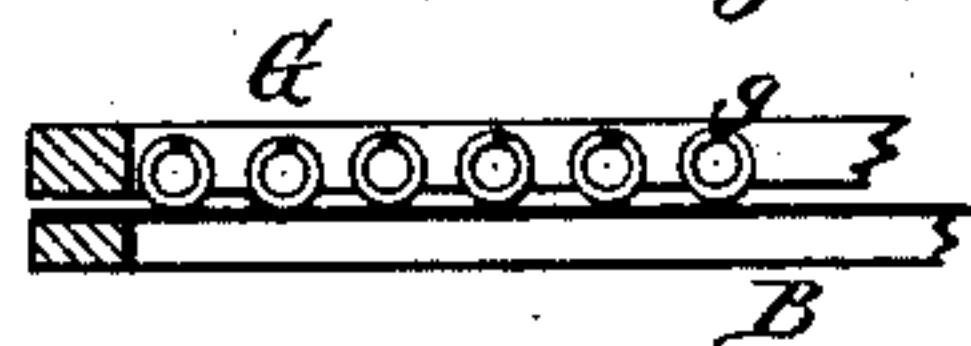


Fig. 10.



Chas. J. Buchheit.  
Geo. J. Buchheit Jr. } Witnesses.

O. M. Morse. Inventor.

By Wilhelm Bonnet,  
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# UNITED STATES PATENT OFFICE.

ORVILLE M. MORSE, OF JACKSON, MICHIGAN, ASSIGNOR TO THE KNICKER-  
BOCKER COMPANY, OF SAME PLACE.

## FLOUR-BOLT.

SPECIFICATION forming part of Letters Patent No. 374,490, dated December 6, 1887.

Application filed April 18, 1887. Serial No. 235,216. (No model.)

*To all whom it may concern:*

Be it known that I, ORVILLE M. MORSE, of the city of Jackson, in the county of Jackson and State of Michigan, have invented a new and useful Improvement in Flour-Bolts, of which the following is a specification.

This invention relates to that class of separating-machines which are provided with inclined or shaking screens, and has the object to produce a machine in which the desired separation is effected upon a smaller screen-surface and more uniformly and expeditiously than heretofore.

My invention is especially designed for use in flour-bolts and other separating-machines, which are employed in the reduction of grain or the manufacture of flour; but it may be employed in various other separating-machines.

My invention consists, principally, in the combination, with the screen, of a cleaner of peculiar construction, as will be hereinafter fully described, and pointed out in the claims.

In the accompanying drawings, consisting of two sheets, Figure 1 is a longitudinal sectional elevation of a separator provided with my improvements. Fig. 2 is a front elevation thereof, partly in section. Fig. 3 is a cross-section in line *x x*, Fig. 1. Fig. 4 is a fragmentary front elevation of the cleaner. Figs. 5 and 6 are sections of the same, respectively in lines *x x* and *y y*, Fig. 4. Fig. 7 is a longitudinal section of a screen provided with my improved cleaners on both sides. Fig. 8 is a perspective view showing a modified construction of my improved cleaner. Fig. 9 is a fragmentary front elevation of another modified construction of the cleaner. Fig. 10 is a cross-section in line *x x*, Fig. 9. Fig. 11 is a sectional view showing a modified application of the cleaner.

Like letters of reference refer to like parts in the several figures.

A represents the stationary case of the separator; B, the main inclined screen, arranged in the same and receiving a shaking or jarring motion in any suitable manner. As shown in the drawings, the screen B is actuated by a flexible connecting-rod, *b*, from an eccentric, *b'*, and is provided with corrugated shoes *c*, which run on supporting-rollers C, attached

to the case A, whereby the screen is at the same time moved back and forth and jarred.

D represents the feed-trough secured to the head of the screen-frame, and E represents the feed-box, arranged transversely on the case A above the head of the trough D, and provided in its bottom with a slot, *e*, through which the material to be separated is discharged into the trough D, from which latter it flows upon the head of the screen.

*f* is the feed-spout, and F a screw-conveyer arranged in the feed-box E, for distributing the material throughout the length of the feed-box.

G represents the cleaner applied to the upper surface of the screen B, and provided with curved or bent wires *g*, which rest upon the screen and produce vibrations of the screen-surface, whereby particles which tend to lodge in the meshes of the same are dislodged. These wires also distribute the material over the screen-surface, whereby all parts of the latter are called into action in effecting the separation, thereby increasing the separating capacity of the screen materially. The cleaner-wires further operate as obstructions, whereby the downward passage of the material is retarded, thereby preventing the material from increasing its speed as it flows over the screen, which would result in an imperfect separation on the lower portion of the screen. The wires of the cleaner also cause the material to turn over or change its position frequently as it flows over the screen, thereby bringing all parts of the material in contact with the screen-surface.

As shown in Figs. 1 and 2, the wires *g* of the cleaner are secured to a frame, *g'*, which is nearly as large as the screen, and which receives a reciprocating or other suitable motion exceeding somewhat the size of the mesh of the cleaner, so that the wires are brought in contact with all parts of the screen-surface. I prefer to bend the wires *g* spirally, as represented in Figs. 4, 5, and 6, and to interlock every two adjacent wires by twisting one into the other, so that the system of cleaning wires forms a net of interlocked spiral wires, as represented in Figs. 2 and 4. This net is very flexible and accommodates itself easily to the



surface of the screen; but if a certain degree of stiffness is required in the cleaner it is readily obtained by inserting stiffening-bars *h* into the wires. The spirally-twisted wires rest  
 5 upon the bolting-cloth of the screen with only a very small part of each of their depressed portions, whereby the wear of the bolting-cloth is reduced to a minimum and the cloth is enabled to vibrate freely, as it is not held  
 10 down by considerable lengths of wire resting on the cloth. The spiral wires are also more flexible than straight wires and follow the undulations of the screen-surface more closely, while they cause the material to turn over  
 15 more frequently in passing over the screen.

The cleaner-frame *g'* may be moved laterally over the screen by levers *I*, which are pivoted to the case *A* above the screen and engage with the upper cross-bar of the frame *g'*. The  
 20 levers *I* are connected to a transverse rod, *i*, which receives motion from a lever, *j*, and cam *J*. The side bars of the cleaner-frame are provided with guide-pins *k*, which slide in openings in the side pieces of the case *A*,  
 25 whereby the cleaner is supported above the screen.

*L* represents a secondary screen, which is arranged below the main screen *B* and receives the material which has passed through the up-  
 30 per portion of the main screen. This lower screen is provided on its upper surface with a cleaner, *G'*, similar in construction to the cleaner *G*. The lower cleaner, *G'*, is actuated by eccentrics *m* and rods *m'*, and the screen *L*  
 35 is jarred by a cam, *n*, engaging against a nose, *n'*, on the screen-frame.

If desired, each screen can be provided with an upper cleaner, *G*, and a lower cleaner, *G'*, as represented in Fig. 7.

40 In the modified construction represented in Fig. 8 the cleaner is formed by transverse wires *o*, which are bent in *U* form, and longitudinal wires *o'*, which are interlocked with the raised portions of the transverse wires *o*.

45 In the modified construction represented in Figs. 9 and 10 the cleaner is provided with spirally-twisted wires arranged side by side, but not interlocked. This construction is somewhat simpler than the constructions in which  
 50 the wires are interlocked, but less desirable, because the wires do not support each other.

In the modified construction represented in Fig. 11 a cleaner, *P*, composed of bent wires, is attached to an endless traveling belt, *p*, and  
 55 serves to sweep the screen *q*.

When the screen is very steep, it is desirable to confine the material on the same by an apron, *R*, of cotton cloth, canvas, or other suit-

able material, placed upon the cleaner, as represented in Fig. 7. This prevents particles 60 from jumping above the cleaner and passing over a considerable portion of the screen at one bound.

I claim as my invention—

1. The combination, with the inclined shaking screen, of a cleaner arranged above the screen and composed of a frame having its bars connected by bent wires formed with alternate depressions and elevations, which wires rest upon the screen, whereby the material is 70 distributed and the flow of the material over the screen is retarded, substantially as set forth.

2. The combination, with the separating-screen, of a cleaner arranged upon the screen 75 and composed of a frame having its bars connected by bent wires formed with alternate depressions and elevations, which wires rest upon the screen, and actuating mechanism whereby the cleaner is moved over the screen, substan- 80 tially as set forth.

3. The combination, with the inclined shaking screen, of a flexible net composed of interlocked wires resting upon the screen, whereby the flow of the material over the screen is equal- 85 ized and retarded, substantially as set forth.

4. The combination, with the inclined shaking screen, of a cleaner resting upon the screen and composed of spirally-twisted wires, sub- 90 stantially as set forth.

5. The combination, with the inclined shaking screen, of a cleaner resting upon the screen and composed of spirally-twisted wires interlocked with each other, substantially as set 95 forth.

6. The combination, with the inclined shaking screen, of a cleaner-frame arranged above the screen and having its bars connected by bent wires constructed with alternate depres- 100 sions and elevations, and mechanism, substantially as described, whereby the cleaner-frame is moved laterally on the screen, substantially as set forth.

7. In a separating-machine, the combination, with an inclined shaking screen, of a 105 cleaner-frame provided with bent wires which bear upon the surface of the screen and retard the flow of material over the same, and an apron placed upon the cleaner, whereby the material is confined, substantially as set forth. 110

Witness my hand this 5th day of April, 1887.

ORVILLE M. MORSE.

Witnesses:

CARL F. GEYER,  
 F. C. GEYER.