

(No Model.)

4 Sheets—Sheet 1.

O. M. MORSE.
BOLTING APPARATUS.

No. 255,002.

Patented Mar. 14, 1882.

Fig. 1.

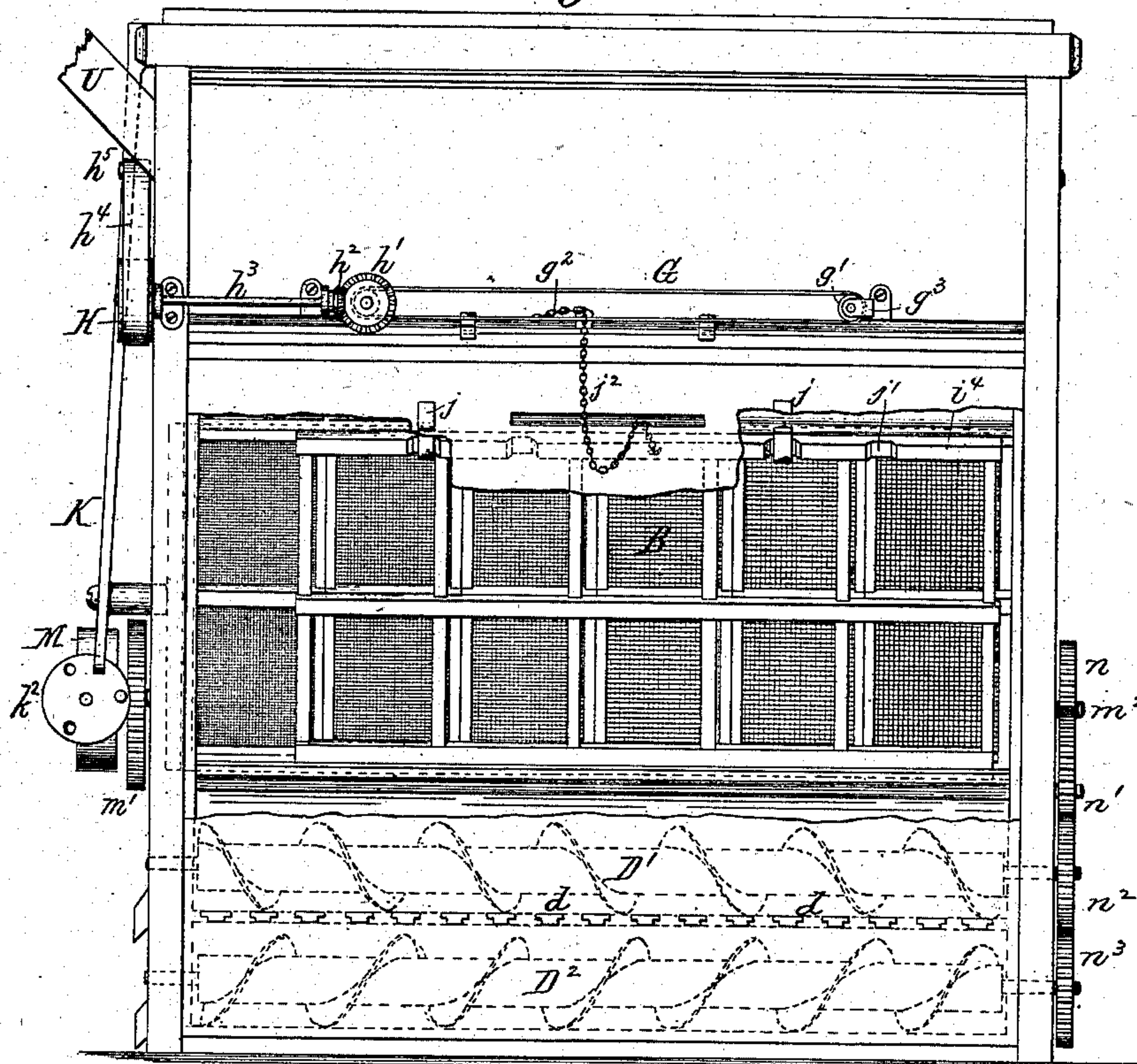
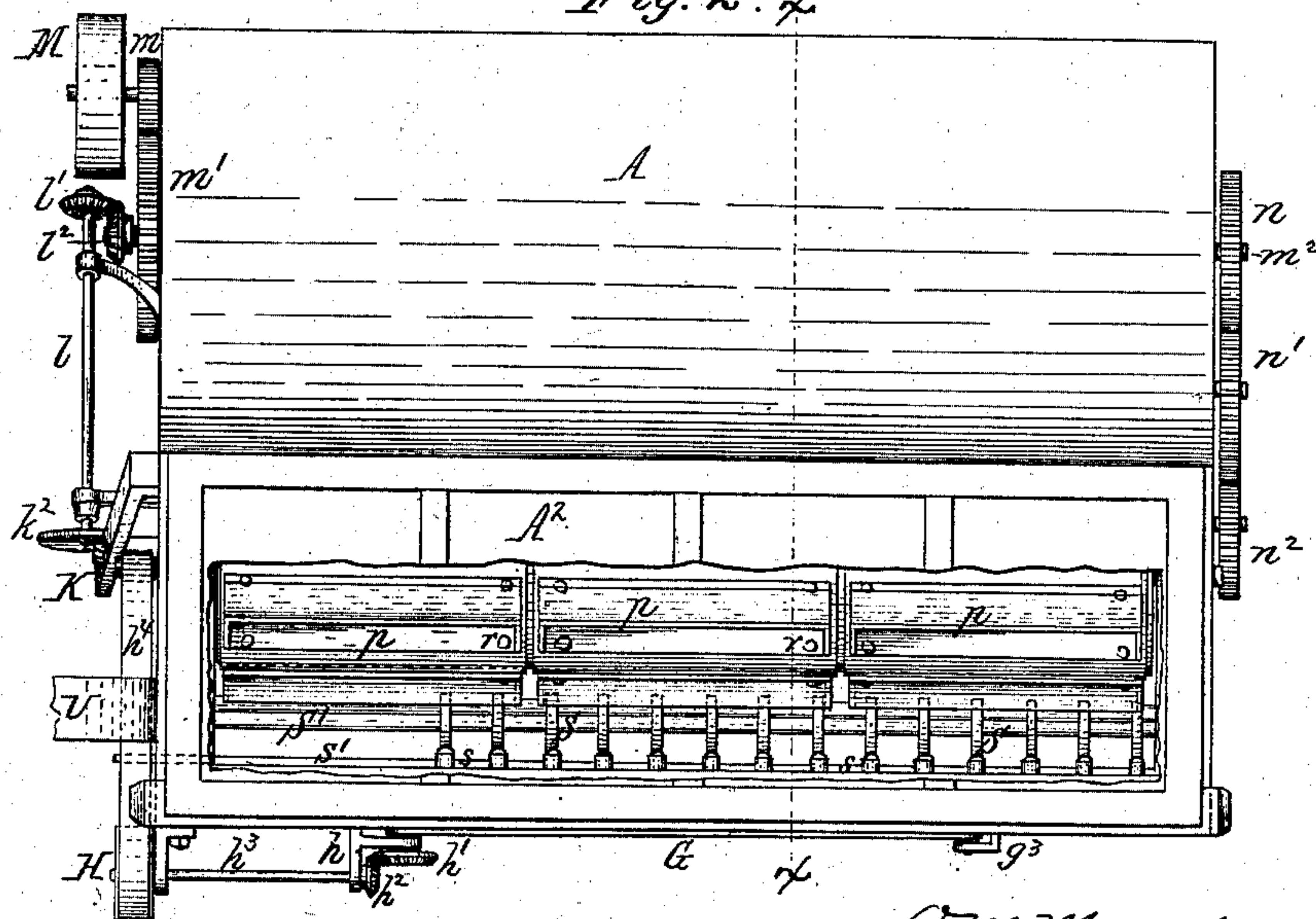


Fig. 2.



Chas. Buchheit.
Edw. J. Brady. Witnesses.

O. M. Morse Inventor.
By Wilhelm Adornet
Attorneys.

(No Model.)

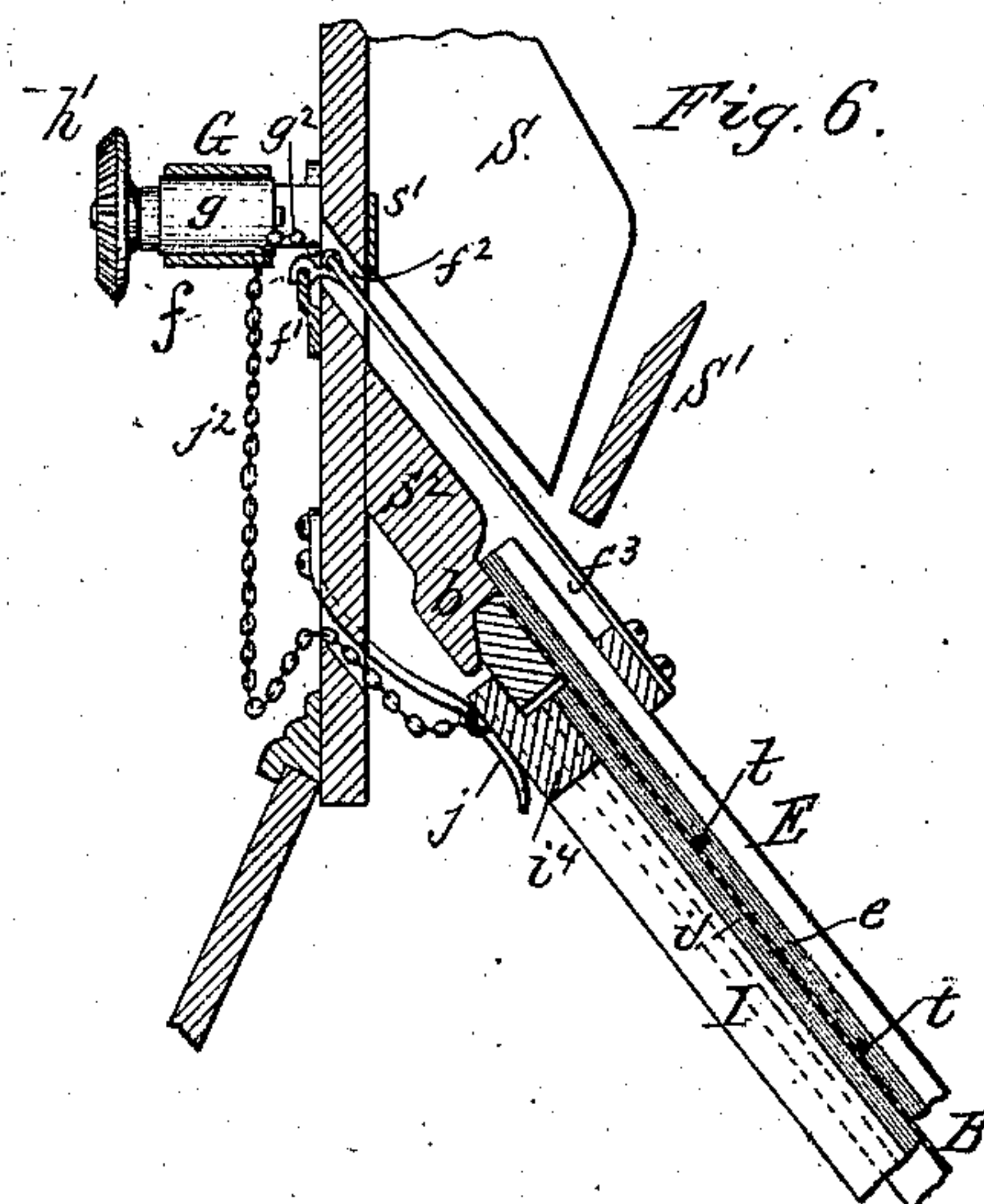
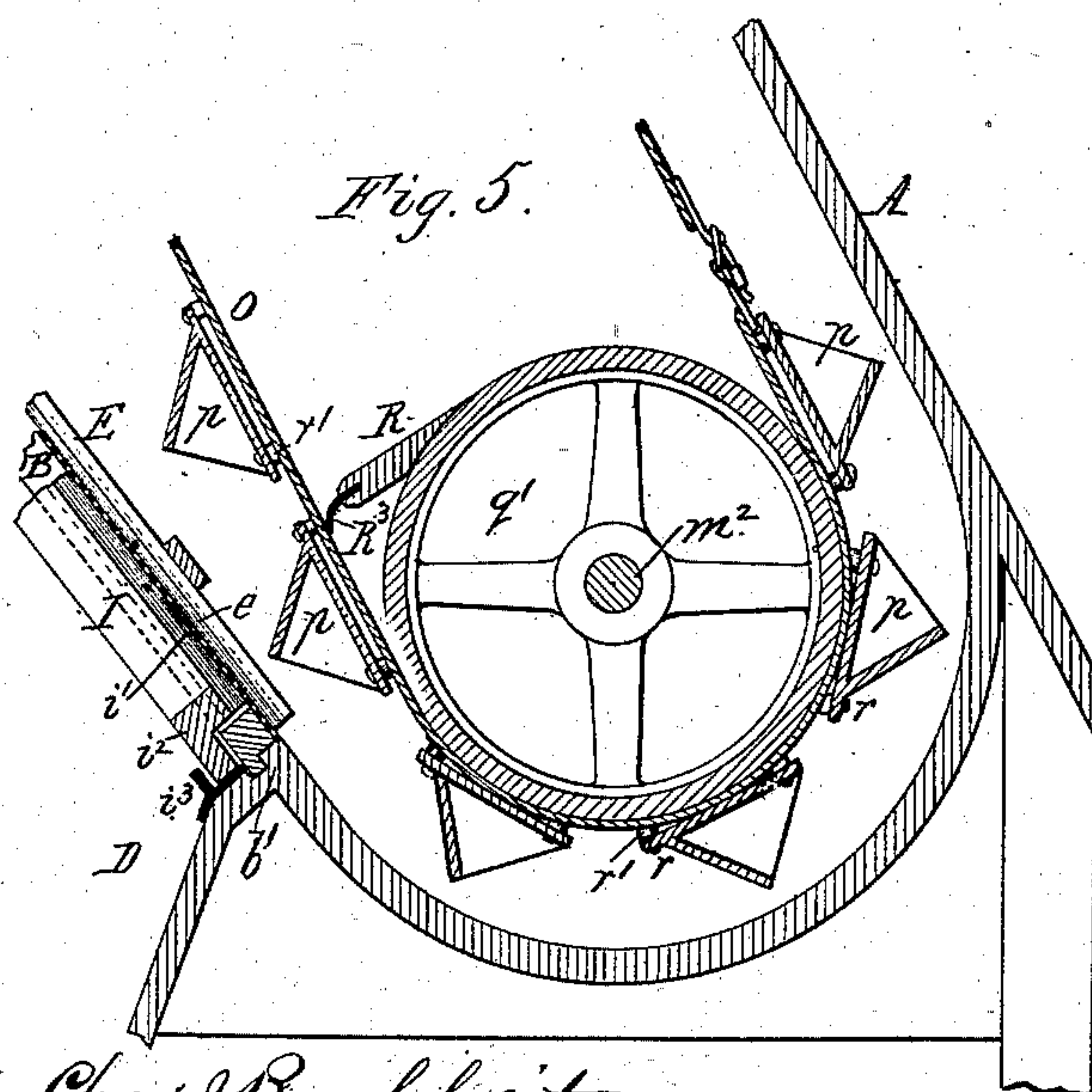
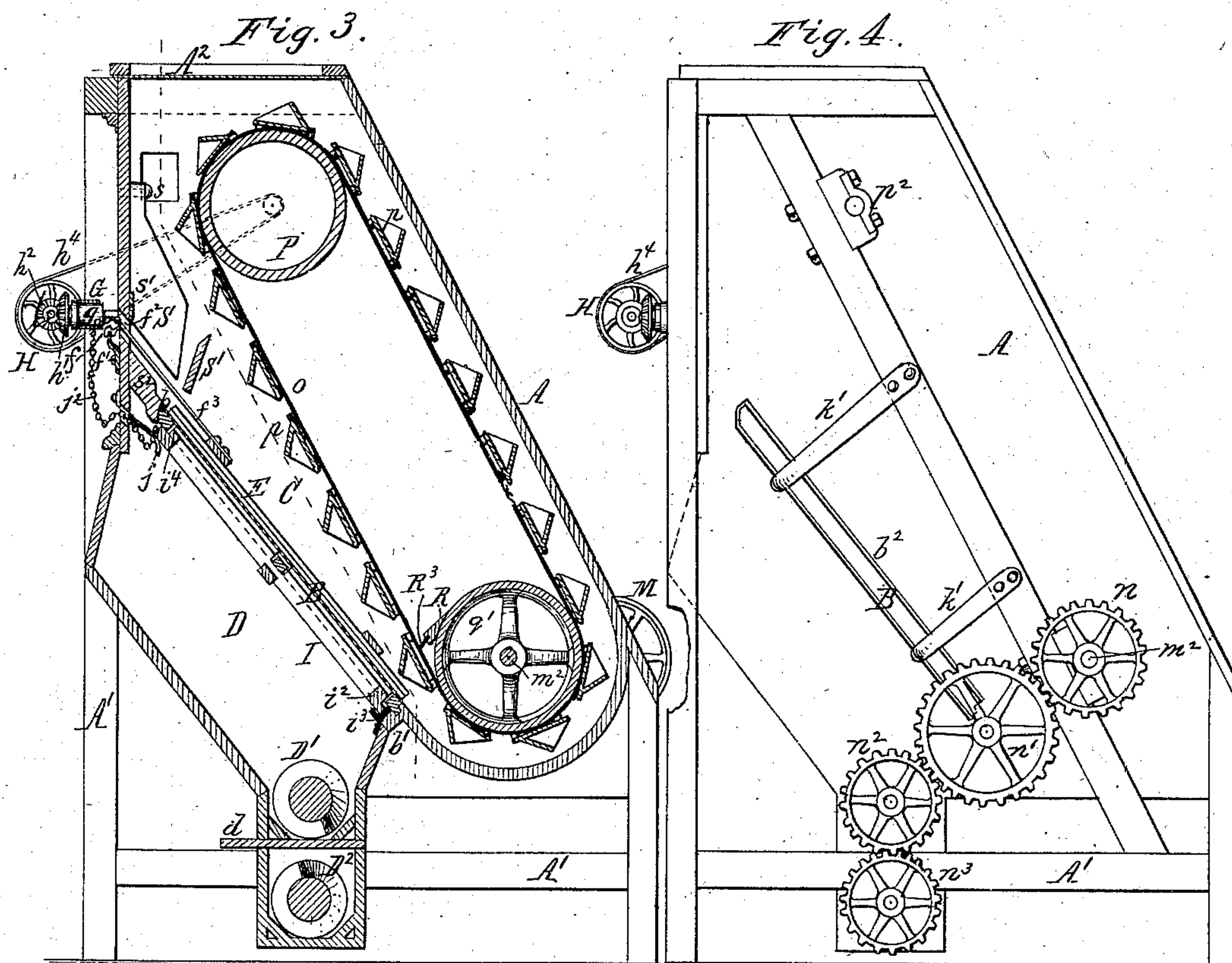
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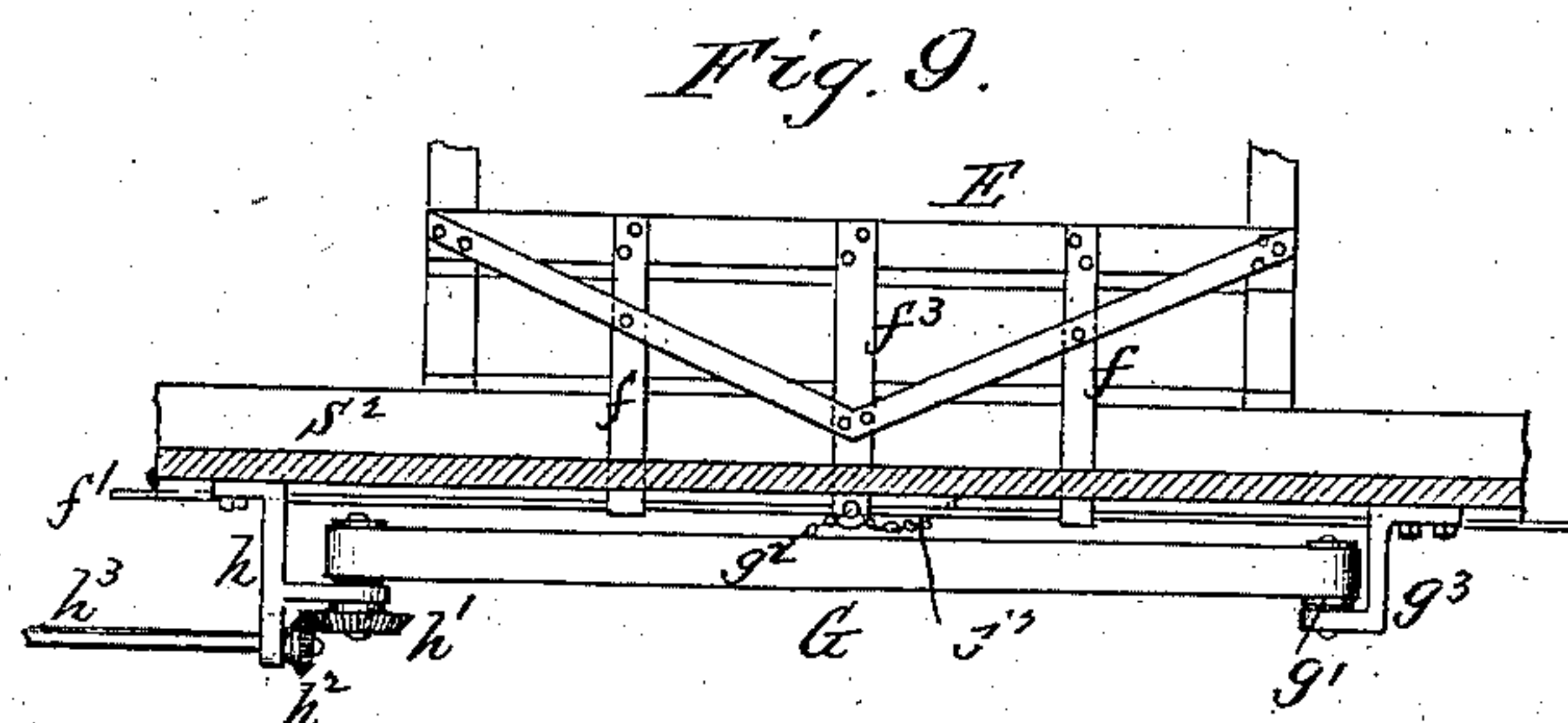
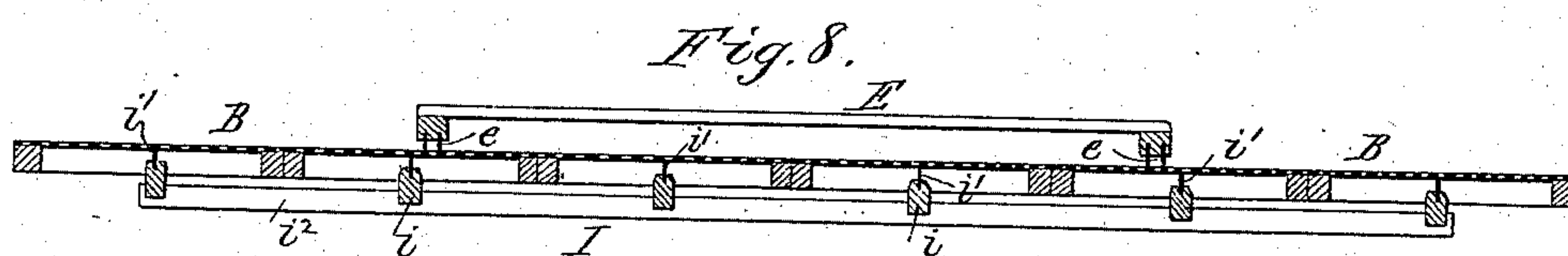
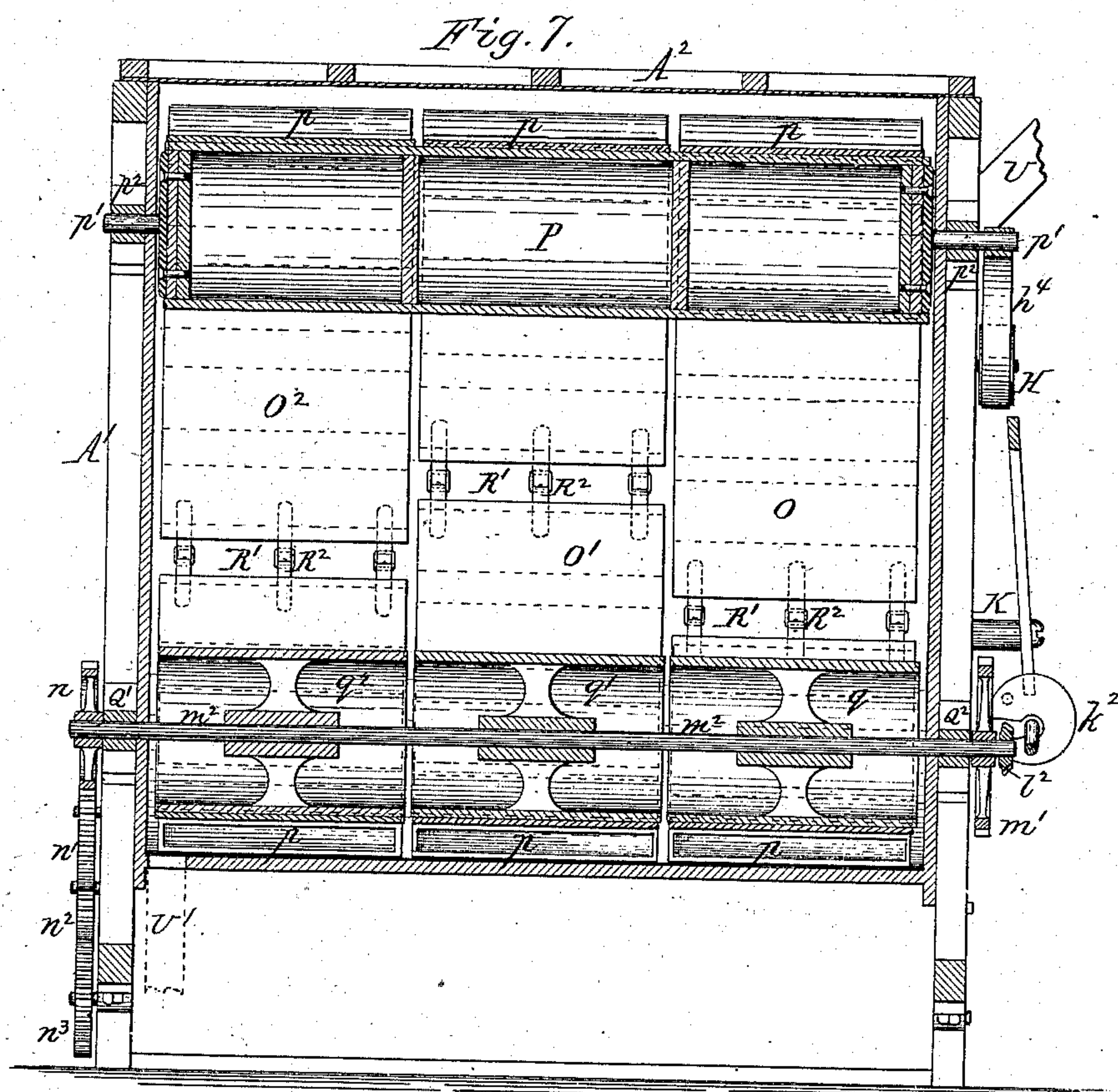
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Chas. J. Buchheit.
Edw. J. Brady

Witnesses.

O. M. Morse Inventor.
By Melville Bonner
Attorneys.

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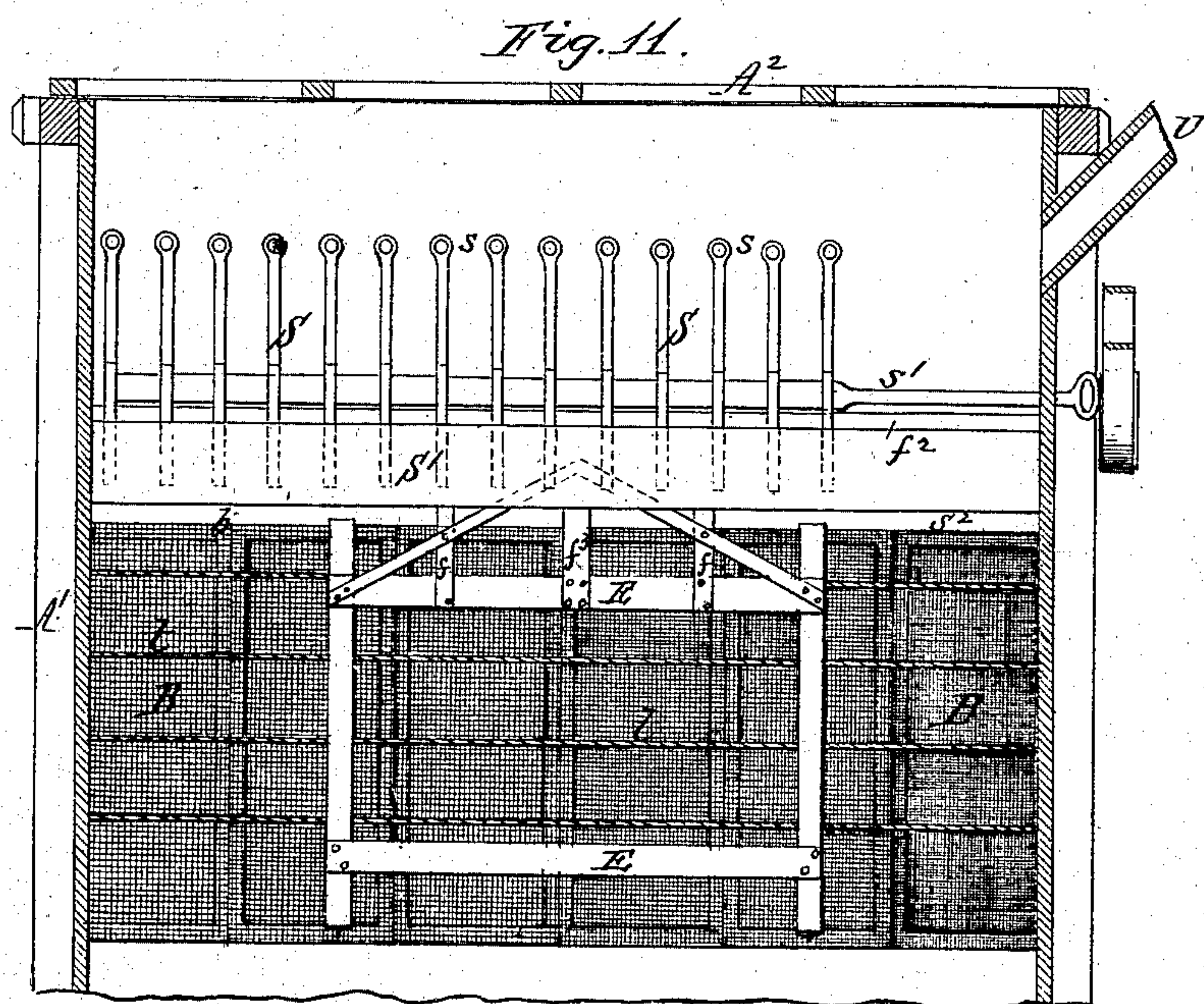
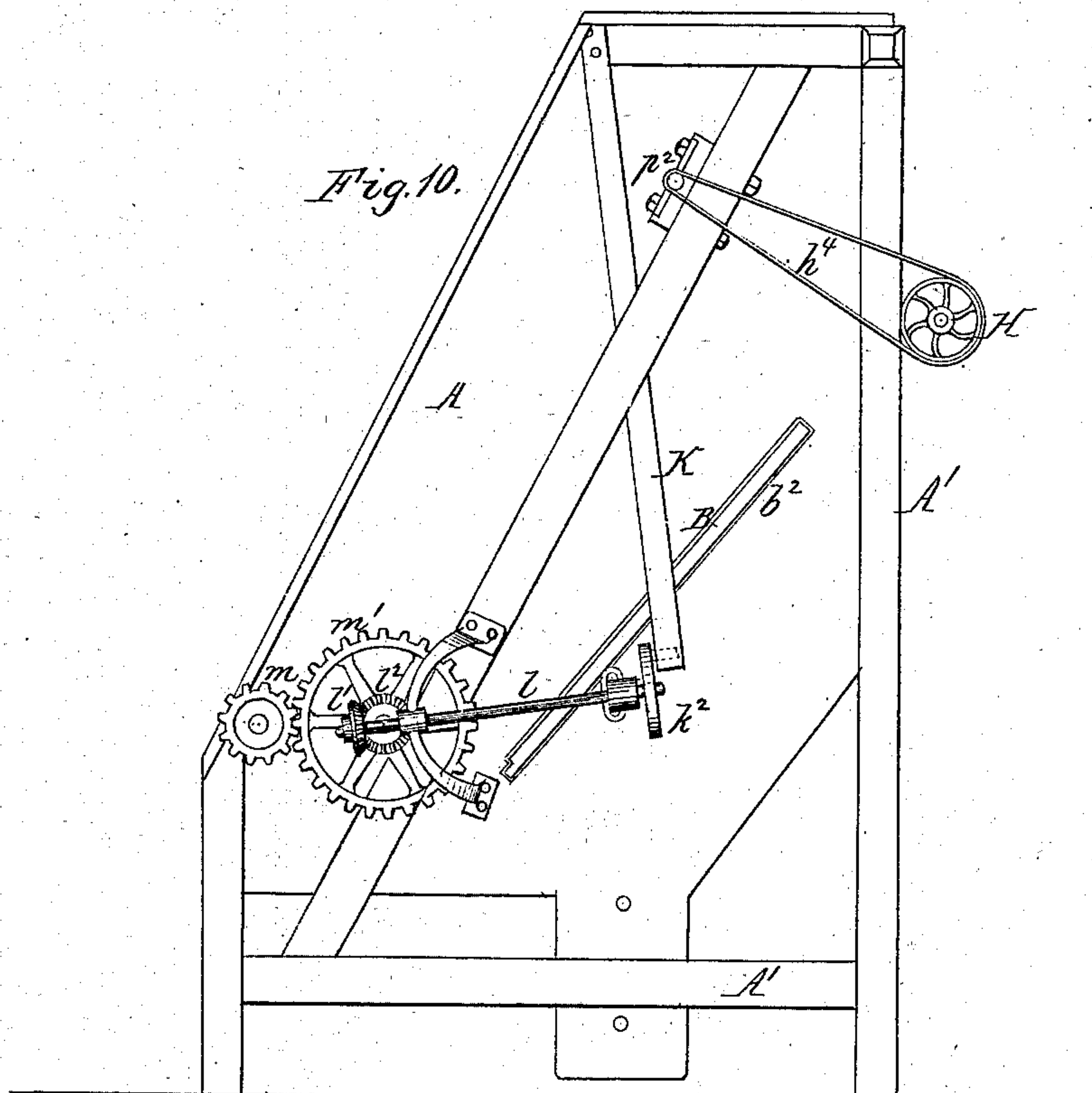
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Chas. J. Buchheit.
Edw. J. Brady.

Witnesses

O. M. Morse Inventor.
By Wilhelm Hornum
Attorneys

UNITED STATES PATENT OFFICE.

ORVILLE M. MORSE, OF SPRINGVILLE, NEW YORK.

BOLTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 255,002, dated March 14, 1882.

Application filed October 8, 1881. (No model.)

To all whom it may concern:

Be it known that I, ORVILLE M. MORSE, of Springville, in the county of Erie and State of New York, have invented new and useful Improvements in Bolting Apparatus, of which the following is a specification.

This invention relates to that class of bolting-machines which are provided with an inclined bolting-surface and an elevating mechanism which faces the bolting-surface, whereby the material to be bolted is repeatedly elevated and caused to flow over the bolting-surface. When bolting very fine material—for instance, meal which has been deprived of the bran—the meshes of the bolting-cloth are liable to become more or less filled, whereby the operation of the machine is impaired and its bolting capacity reduced.

The object of my invention is to obviate this difficulty and to render the machine otherwise more reliable and uniform in its operation.

My invention consists to that end of the peculiar mechanism whereby the meshes of the bolting-cloth are kept open; also, of the peculiar construction of the elevating mechanism, and of the means whereby the elevating mechanism is prevented from clogging; also, of the means whereby the flow of the material over the bolting-surface is controlled, as will be hereinafter fully set forth.

In the accompanying drawings, consisting of four sheets, Figure 1 is a front elevation of my improved bolting apparatus with a part of the case broken away. Fig. 2 is a top plan view thereof with a portion of the case broken away. Fig. 3 is a cross-section of the machine in line *xx*, Fig. 2. Fig. 4 is an elevation of the tail end of the machine. Fig. 5 is an enlarged cross-section of the lower part of the machine. Fig. 6 is an enlarged cross-section of the upper portion of the bolting-surface and connecting parts. Fig. 7 is a longitudinal sectional elevation of the machine. Fig. 8 is a horizontal section of the bolting-screen and wipers. Fig. 9 is a top plan view of the belt and connecting parts whereby the wipers are operated. Fig. 10 is an elevation of the head end of the machine. Fig. 11 is an inside sectional elevation of the upper front portion of the machine.

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

A represents the inclosing case of the machine, secured to the frame A', both constructed in any suitable and well-known manner.

B represents the inclined bolting-screen, consisting preferably of a suitable number of screen-sections, covered with bolting-cloth of proper mesh, and arranged side by side between horizontal ways *b b'*, which are secured to the frame A' of the machine.

b² are openings formed in the case A, between both ends of the ways *b*, (Figs. 4 and 10,) for inserting and removing the screen-sections.

C represents the meal-chamber above the screen B, in which the elevating mechanism is arranged; and D represents the flour-chamber underneath the screen, which receives the material which passes through the screen, and which is provided with two conveyers, D' D², having cut-offs or slides *d*, whereby different grades of the sifted material can be commingled or be drawn off separately at desire.

E represents a wiper or brush frame arranged to travel back and forth over the upper surface of the screen B. This frame is provided, as shown in Fig. 8, with flexible strips *e*, of rubber or similar material, which bear against the bolting-cloth and remove the material which may adhere thereto. Two strips, *e*, are preferably arranged near together, whereby the first strip will remove the material lying on the cloth, while the strip following immediately after the first strip will bear upon the clean cloth and thoroughly dislodge the material which is contained in the meshes of the cloth. The frame E is made of wood and very light, so that the pressure which the strips *e* exert upon the cloth is just sufficient to clean the cloth without, however, wearing or abrading the same. The frame E is preferably made about half as long as the bolting-sieve B, so that its movement equals one-half the length of the bolting-surface. The frame E is supported by two bars, *f*, which project upward and hook over and slide on a horizontal rail or bar, *f'*, secured to the casing of the machine in front of a horizontal slot, *f²*, formed in the front side of the casing. The frame E is op-

erated by a horizontal endless belt, G, arranged at the front side of the machine near the slot f^2 . The belt G runs over two pulleys, g g' , and is connected with an upwardly-projecting arm, f^3 , of the frame E by a cord, chain, or rope, g^2 , whereby the frame E is drawn back and forth over the bolting-cloth. The pulley g is secured to a short shaft, which turns in a bracket, h , and which carries at its outer end a bevel-wheel, h' . The latter is driven by a bevel-pinion, h^2 , which is secured to the inner end of a horizontal shaft, h^3 , its outer end being provided with a pulley, H, to which motion is communicated by an endless belt, h^4 , from a pulley, h^5 , mounted on the upper shaft of the elevating mechanism. The pulley g' turns loosely on an arbor or stud, which is secured to a bracket, g^3 . Both pulleys are free or unobstructed at their inner sides, so that the chain g^2 can pass freely around the pulley with the belt.

I represents a wiper or brush frame arranged to traverse the lower surface of the bolting-screen B. This frame is provided with a number of upright bars, i , which project into the panels or recesses formed on the under side of the bolting-screen B by the frames of the several screen-sections. The lateral movement of the frame I is limited to the length of one of these panels, and a wiper, i' , is provided for each panel, which it is necessary to clean by such means. The lower horizontal piece, i^2 , of the frame I is guided on a rail, i^3 , secured to the casing of the flour-chamber D, and the upper horizontal piece, i^4 , of the frame I is guided by means of ears j , which project downward from the casing. The horizontal top piece, i^4 , is preferably provided at its outer side with notches j' , which permit the upper end of the frame I to drop forward when it arrives at either end of its movement, thereby holding the wipers away from the bolting-cloth while the frame I is stationary, and preventing the cloth from becoming worn by vibrating against the wipers. The frame I is operated by a chain, rope, or cord, j^2 , which connects the frame with the endless belt G, and which has sufficient slack or excess of length to move the frame I only the length of one panel in each direction.

K represents a knocker, which is secured with its upper end to the frame of the machine, and which bears with its lower end against the bolting-sieve B.

k' represents one or more springs, applied to the opposite end of the sieve B, for the purpose of jarring the same in connection with the knocker. The knocker is operated by a wheel, k^2 , provided with a suitable number of removable pins, which can be inserted or removed at pleasure, and whereby the knocker can be operated one or more times at every revolution of the wheel, as may be desired. The wheel k^2 is mounted on a shaft, l , which is rotated by means of bevel-wheels l' l^2 from the lower shaft of the elevating mechanism.

M represents the driving-pulley, from which motion is transmitted by a pinion, m , to a gear-wheel, m' , mounted on the lower shaft, m^2 , of the elevating mechanism.

n represents a gear-wheel, which is mounted on the opposite end of the shaft m^2 , and which transmits motion to the conveyers D' D² by means of an idler-wheel, n' , and gear-wheels n^2 n^3 .

As shown in the drawings, the elevating mechanism consists of three endless belts, o o' o^2 , provided with buckets p . The belts run over a head-pulley or drum, P, which is provided with journals p' , turning in bearings p^2 , attached to the frame A. q q' q^2 represent the lower pulleys of the elevating mechanism. The pulley q is firmly secured to the shaft m^2 , which turns in bearings Q' Q², and the pulleys q' q^2 turn loosely on the shaft m^2 , whereby each of the three belts is enabled to move independently of the other belts, so that if either belt should move slightly faster or slower than the other belts the parts will not bind. The buckets p are arranged most closely together on the head-belt o , less closely on the second belt, o' , and farthest apart on the tail-belt o^2 , as indicated by dotted lines in Fig. 7, to correspond with the quantity of material which is to be elevated by each belt as the material decreases in quantity from the head toward the tail of the machine. The buckets p are secured to the belts by rivets r , which are provided with washers r' , preferably constructed of rubber or similar material, arranged on the rivets between the buckets and the belts, to permit the belts to adapt themselves to the convex faces of the pulleys as the buckets pass around the same.

The endless belts of the elevating mechanism are arranged farther away from the bolting-screen at the top of the screen than at the bottom, as shown in the drawings, in order to prevent the buckets from coming in contact with the screen by the sagging of the belts and to afford the necessary room for the upper wiper-frame, E.

R is a scraper-plate, secured to the frame or casing of the machine and arranged to bear against the upper sides of the lower pulleys, q q' q^2 , between both parts of each belt, for the purpose of removing from the pulleys any meal which may adhere to their faces, and which would, if not removed, accumulate, and thereby increase the size of the pulleys and strain the belts. The scraper-plate R inclines toward the descending side of the belts, and discharges the material which is removed from the pulleys through openings R', formed in the belts between their ends, which are secured together by straps R², or other suitable means, so as to form these openings. If preferred, however, the scraper-plate R may be inclined or curved lengthwise, so as to discharge the material over the outer edges of the end pulleys between the legs of the elevator-belts, when no openings need be provided in the latter.

R^3 is a flexible wiper or brush, attached to the lower edge of the scraper R, and bearing against the inner sides of the descending portions of the belts, so as to detach any material which may adhere to the belts. The material accumulates on the wiper until the openings R' arrive opposite the lower end thereof, when the material is discharged through these openings.

10 S represents deflecting-boards, arranged in the upper portion of the meal-chamber opposite the descending side of the head portion of the elevating mechanism. These boards are pivoted at s to the case, and connected by a bar, s' , which extends to the outside of the case, whereby the position of the boards can be adjusted so as to accelerate or retard the movements of the meal toward the tail end of the machine, as may be desired.

20 S' is a shield or guard-board, which is arranged above the upper edge of the bolting-screen B and below the lower ends of the deflecting-boards, so as to prevent the material from falling directly from the head of the elevating mechanism upon the bolting-cloth, as this would tend to wear the cloth, and might force specks and impurities through the cloth. The board S' compels the material, as it falls from the elevating-mechanism, to fall first upon the imperforate strip S^2 above the upper edge of the bolting-surface, which strip is constructed of wood or other suitable material, and receives the impact of the falling material. The latter descends from the strip S^2 without any sudden shocks over the bolting-surface. The descent of the material over the bolting-surface may be retarded on the coarser grades of cloth, if necessary, by cords t , secured transversely by gluing or otherwise to the upper surface of these cloths.

40 U represents the feed-spout, through which the material to be bolted is introduced into the case at the head of the machine; and U' is the bran-discharge spout, arranged at the tail end of the bottom of the casing. The top A^2 of the casing A is preferably covered with cotton fabric or similar material, which permits the escape of the vapor from the meal.

50 The machine is slightly inclined from its head toward its tail, whereby the material is caused to move slowly from the feed end to the discharge end of the casing in a well-known manner.

I claim as my invention—

55 1. In a bolting-machine, the combination, with an inclined screen and an elevating mechanism facing the screen, of a wiper or brush bearing against the screen, and mechanism whereby the wiper or brush is caused to move horizontally back and forth over the screen, substantially as set forth.

65 2. The combination, with the inclined screen B and an elevating mechanism facing the screen, of a wiper or brush frame, E, arranged upon the upper side of the screen, and an end-

less belt, G, adapted to move the frame E back and forth over the screen, substantially as set forth.

3. The combination, with the inclined screen B, of the wiper or brush frame E, resting upon the screen and provided with hooked bars f , a rail, f' , upon which the bars f slide, and mechanism whereby the frame E is moved back and forth over the screen, substantially as set forth.

4. The combination, with the inclined screen B, of a wiper or brush frame, E, resting upon the screen, and guides which support said frame, an endless belt, G, and a cord or chain, g^2 , whereby the endless belt is connected with the frame E, substantially as set forth.

5. In a bolting apparatus, the combination, with an inclined screen, B, of brush or wiper frames E and I, arranged respectively above and below the screen, and mechanism whereby these frames are moved horizontally back and forth over the screen, substantially as set forth.

6. The combination, with a bolting-screen, B, of a brush or wiper frame, I, an endless belt, G, and a slack chain or rope, j^2 , whereby an intermittent reciprocating motion is imparted to the frame I, substantially as set forth.

7. The combination, with an inclined bolting-screen, B, of a brush or wiper frame, I, arranged on the under side of the screen, ears j , which guide the upper part of the frame, and notches j' , formed in the upper part of the frame I, whereby the frame is permitted to recede from the screen, substantially as set forth.

8. The combination, with an inclined screen, B, of an elevating mechanism composed of one or more endless bucket chains or belts arranged to face the screen and converging on its descending side toward said inclined screen from the top toward the bottom thereof, substantially as set forth.

9. In a bolting apparatus, an elevating mechanism composed of two or more endless bucket belts or chains, the buckets being arranged at increasing distances apart on the successive belts or chains from the head toward the tail of the machine, substantially as set forth.

10. In a bolting apparatus, the combination, with the elevator-belt, of buckets p , rivets r , and washers r' , applied to the rivets between the buckets and the belts, substantially as set forth.

11. The combination, with the elevator belt or belts and the bottom pulley or pulleys, q q' q^2 , of a scraper, R, bearing against the upper side of the bottom pulley or pulleys, substantially as set forth.

12. The combination, with the elevator belt or belts provided with openings R' , and the bottom pulley or pulleys, q q' q^2 , of a scraper-plate, R, bearing against the upper sides of the bottom pulley or pulleys and inclining toward the descending side of the elevator belt or belts, substantially as set forth.

13. The combination, with the elevator belt

or belts, of a wiper, R^3 , bearing against the inner side of the belt or belts, substantially as set forth.

14. The combination, with the elevator belt
5 or belts, of a bottom pulley or pulleys, of a scraper, R , bearing against the upper sides of the bottom pulley or pulleys, and a wiper, R^3 , attached to the scraper R and bearing against the inner side of the elevator belt or belts, sub-
10 stantially as set forth.

15. The combination, with an inclined bolting-screen, B , of a plate, S , strip S^2 , arranged above the upper edge of the screen and receiving the impact of the falling material, an elevating mechanism facing the inclined screen,

and a shield or guide-board, S' , adapted to prevent the material from falling directly from the elevating mechanism on the screen, substantially as set forth.

16. An inclined bolting-screen provided on 20 its upper side with transverse ribs or cords t , secured to or resting on the bolting-surface, whereby the material is compelled to flow over these obstructions, thereby retarding its descent, substantially as set forth.

ORVILLE M. MORSE.

Witnesses:

EDWARD WILHELM,
EDW. J. BRADY.