

(No Model.)

2 Sheets—Sheet 1.

O. M. MORSE.
BOLTING APPARATUS.

No. 304,223.

Patented Aug. 26, 1884.

Fig. 2.

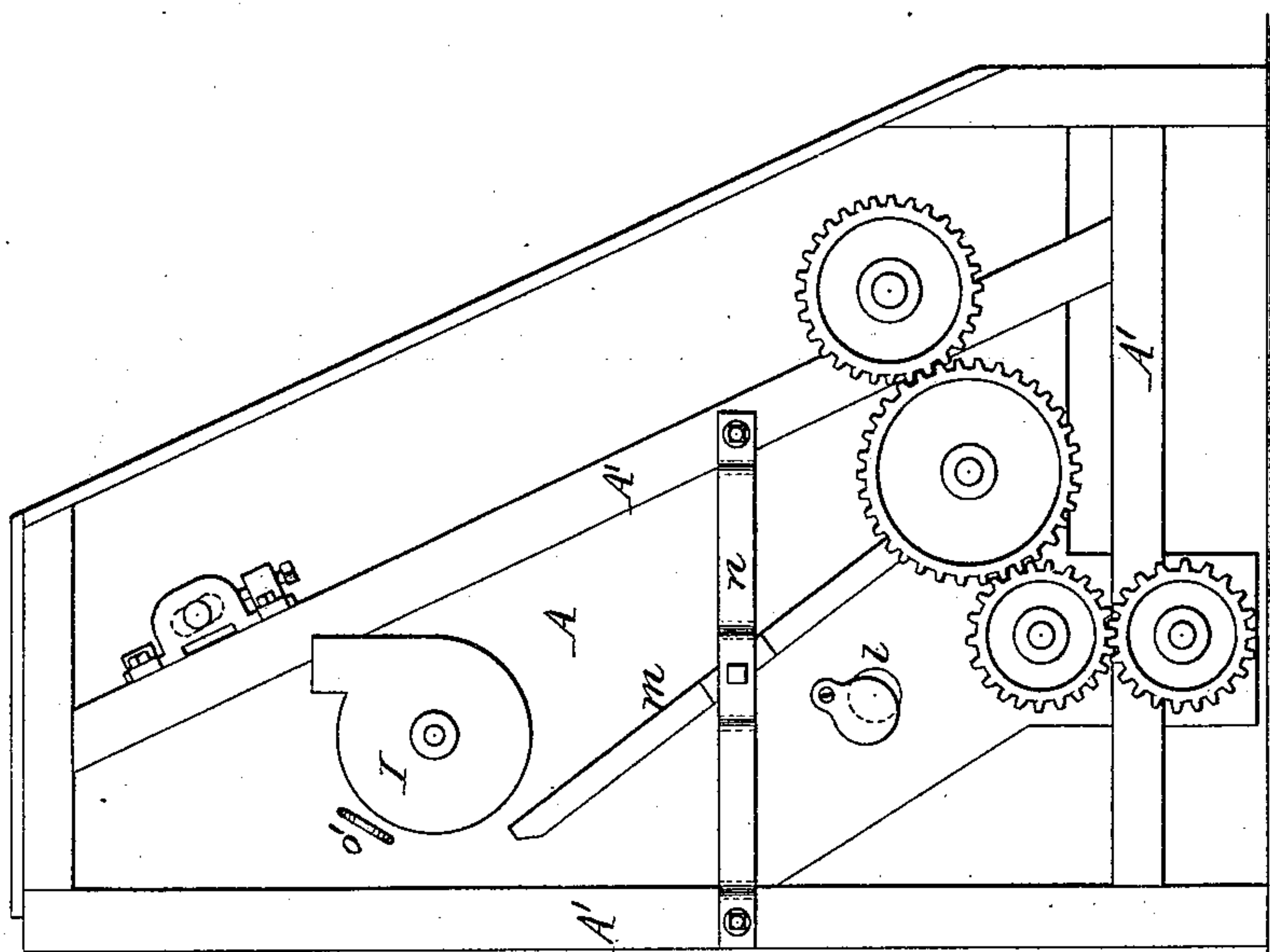


Fig. 1.

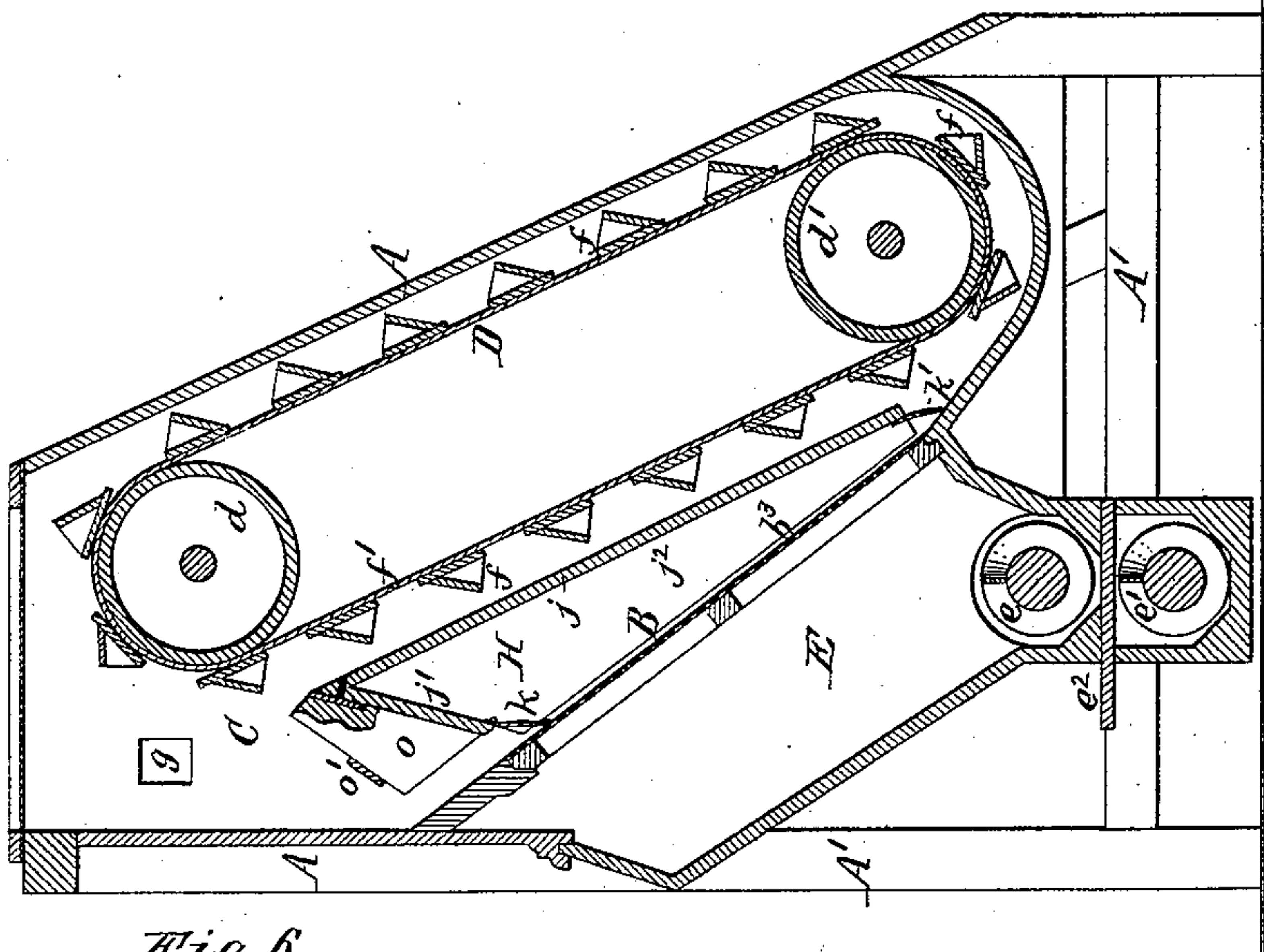
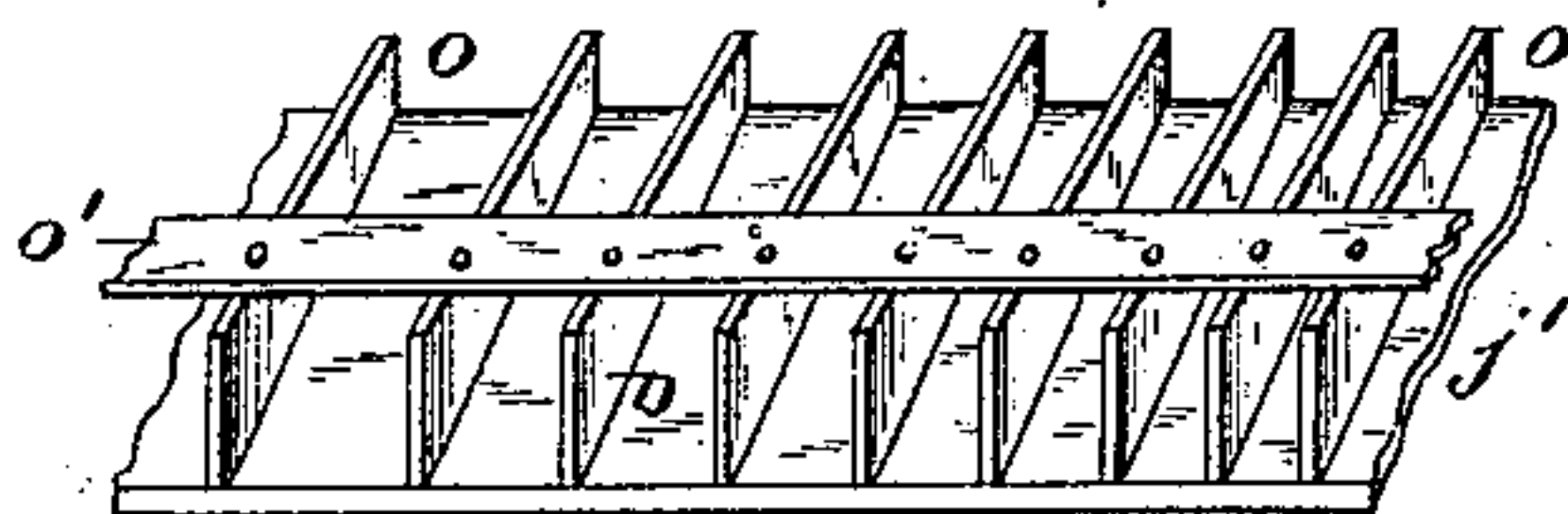


Fig. 6.



Chas. J. Buchheit
Theo. L. Popp. } Witnesses.

Orville M. Morse Inventor.
By Wilhelm & Bonner.
Attorneys.

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Fig. 3.

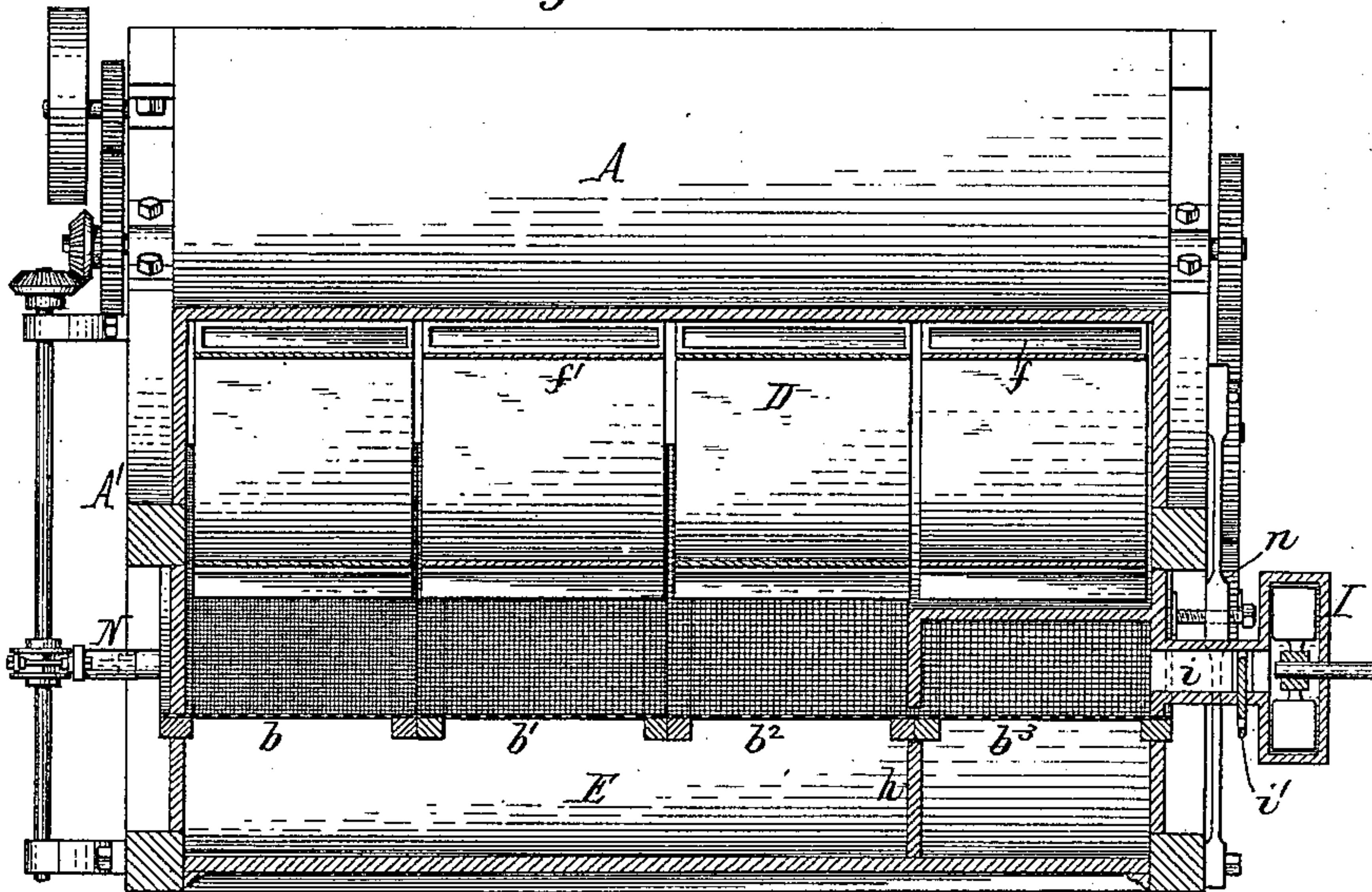


Fig. 4.

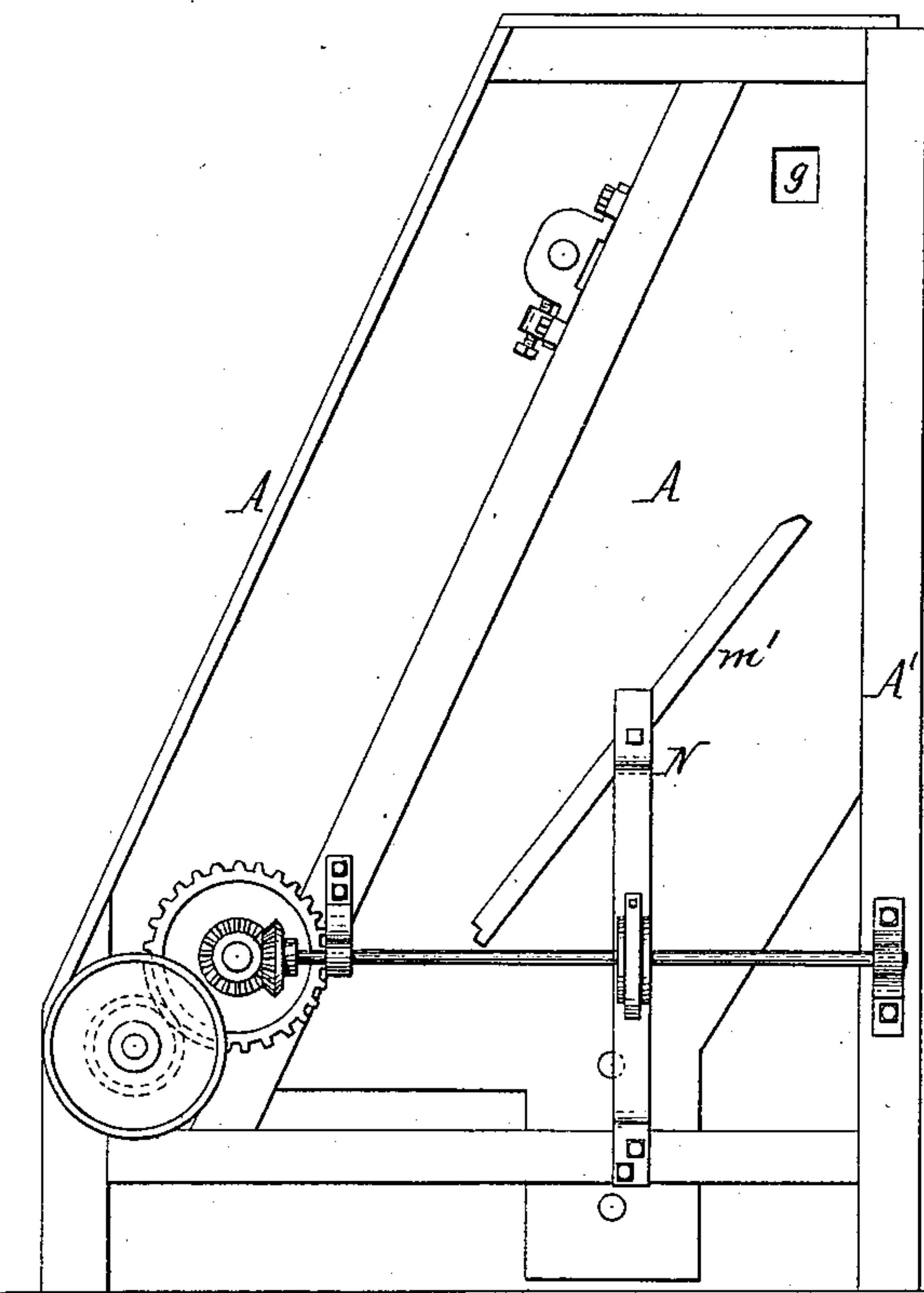
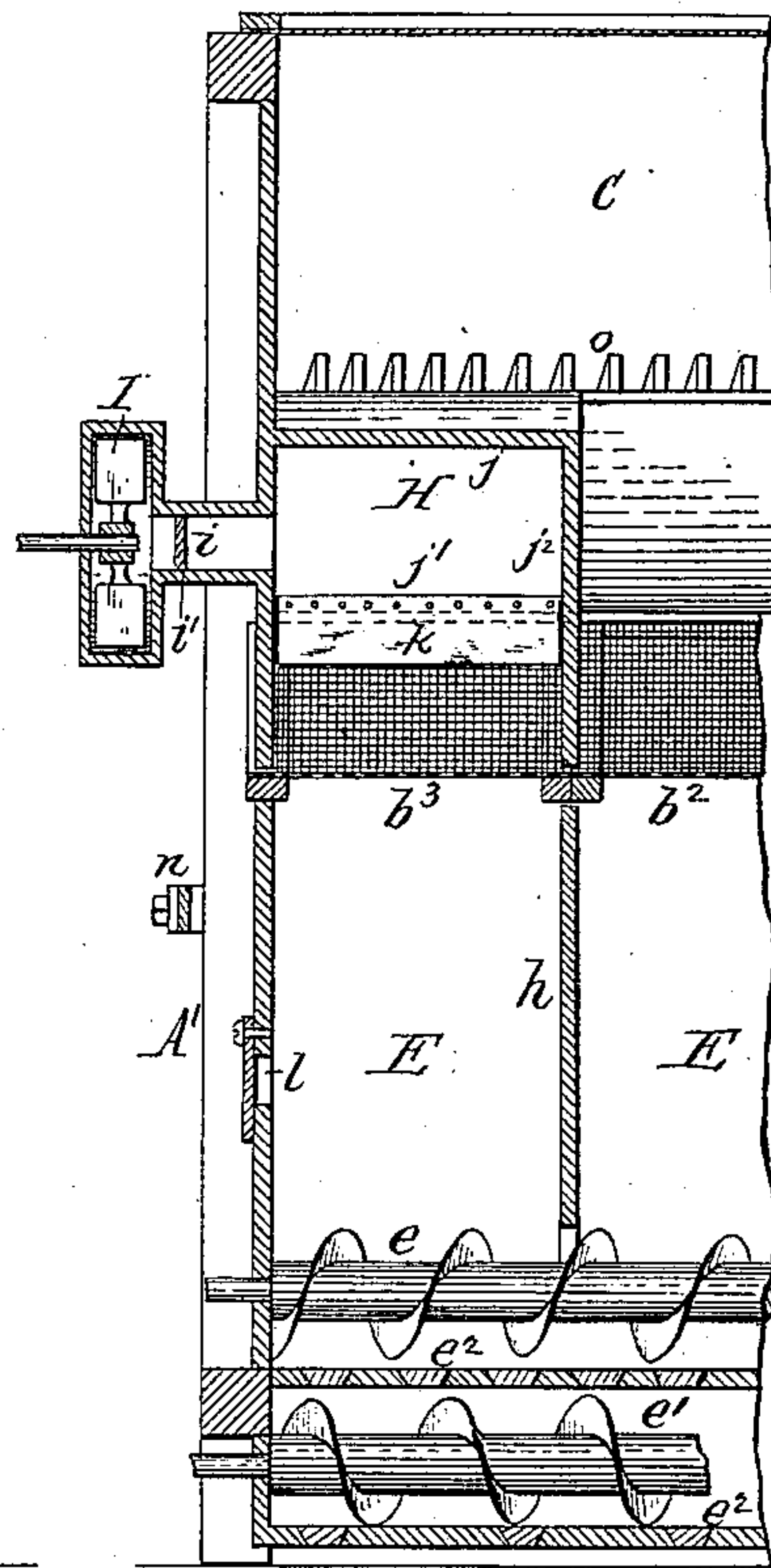


Fig. 5.



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Theo. L. Popp } Witnesses.

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UNITED STATES PATENT OFFICE.

ORVILLE M. MORSE, OF JACKSON, MICHIGAN, ASSIGNOR TO THE KNICKERBOCKER COMPANY, OF SAME PLACE.

BOLTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 304,223, dated August 26, 1884.

Application filed December 12, 1883. (No model.)

To all whom it may concern:

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

This invention relates to an improvement in that class of bolting or separating machines which are composed of an inclined sieve and
10 an elevating mechanism, whereby the material which has passed over the sieve and escaped from the lower end thereof is elevated and delivered upon the upper end of the sieve, and in which the material is at the same time
15 caused to move gradually across the sieve, so that the material is repeatedly elevated and caused to flow over the inclined sieve in passing through the machine. Apparatus of this character is described and shown in Letters
20 Patent of the United States No. 225,536, dated March 16, 1880, and No. 255,002, dated March 14, 1882, to which reference is here made for a more complete description of the same.

The object of the present invention is to
25 adapt the machine, partly or wholly, to the purification of middlings, by organizing the machine in such manner that an air-current can be directed through the inclined sieve or a portion thereof; and my invention consists
30 of the improvements which will be hereinafter fully set forth, and pointed out in the claims.

In the accompanying drawings, consisting of two sheets, Figure 1 is a vertical cross-section of my improved machine. Fig. 2 is an
35 elevation of the tail end of the machine. Fig. 3 is a horizontal section of the machine. Fig. 4 is an end elevation of the feed end of the machine. Fig. 5 is a vertical section of the tail end of the machine. Fig. 6 is a front elevation
40 of the deflecting-boards.

Like letters of reference denote like parts in the several figures.

A is the inclosing-case of the machine, secured to a frame, A', and constructed in any
45 suitable or well-known manner.

B represents the separating or bolting screen, arranged in an inclined position within the case A, and composed of a suitable number of sections, b b' b^2 b^3 , arranged side by side. The
50 several sections are clothed with bolting-cloth

of the proper mesh, in accordance with the particular kind of work for which the machine is designed. Ordinarily the sections are clothed with cloth of increasing coarseness from the head toward the tail of the machine, the section b being covered with the finest and the section b^3 with the coarsest cloth. The screen is preferably so inclined that the material will flow over the same by gravity.

C represents the meal-chamber, above the screen B, in which the elevating mechanism D is arranged, and which receives the material to be separated or bolted.

E represents the flour-chamber, underneath the screen, which receives the fine material which has been bolted through the inclined screen, and which is provided with suitable conveyers, e e' , and slides e^2 , for drawing off the various grades of the bolted material, as may be desired.

The elevating mechanism consists, preferably, of pulleys or drums d d' and buckets f f' , running around the pulleys d d' ; but any other suitable elevator—for instance, a bucket-reel—may be employed, if preferred.

g represents the feed-opening, through which the material to be separated or bolted is delivered into the meal-chamber C.

H represents an air-chamber arranged above that portion of the inclined screen through which an air-current is required to be passed for purifying the material which flows over the screen. When a portion only of the screen is required for purification, the air-chamber H is arranged over the coarse portion of the screen. In the drawings it is shown as being arranged over the last section, b^3 , of the screen. In this case that portion of the flour-chamber which is located underneath the chamber H is separated from the rest of the flour-chamber by a partition, h , to confine the action of the air-current to the material which passes through the portion of the screen which is located below the chamber H; but when the entire screen is required for purification the chamber H extends over the entire screen.

I represents a suction-fan, the eye of which is connected by an air-spout, i , with the chamber H, so as to exhaust the air therefrom. The

force of the air-current can be regulated by a slide, *i'*. The air-chamber H is arranged above the inclined screen between the lower portion of the elevating mechanism and the screen, and consists of an inclined back plate, *j*, extending along the under side of the elevating mechanism and secured to the end wall of the case A, a top plate, *j'*, depending from the upper edge of the back plate, *j*, and a side plate, *j''*, extending downwardly and terminating as closely to the surface of the screen as practicable.

k and *k'* are flexible strips or curtains secured, respectively, to the plates *j'* and *j*, and resting on the screen or portions of the case in the plane of the screen, to prevent, as much as possible, air from being drawn into the chamber H, except through the screen.

l represents an opening formed in the end wall of the case A, for the purpose of admitting air to the flour-chamber underneath the air-chamber H. The ends of the screen-frame project through openings *m m'*, formed in the end walls of the case A. One end of the screen-frame rests against a spring, *n*, and the other end of the screen-frame is struck by a knocker, N, whereby the screen is jarred and the meshes are kept open.

o represents adjustable deflecting-boards pivoted to the upper side of the top plate, *j'*, of the chamber H, and connected by a shifting-bar, *o'*, whereby the position of the deflecting-boards *o* can be regulated. These deflecting-boards can be adjusted so as to turn or deflect the material as it is discharged from the elevator toward or from the head of the machine, thereby accelerating or retarding the tendency of the material to work toward the tail end of the machine, which tendency is given to the material by a slight inclination or pitch of the machine from its head toward its tail end. By inclining the deflecting-boards more or less toward the head of the machine the progress of the material toward the tail end is more or less retarded. The deflecting-boards are preferably arranged more closely together as they approach the tail end of the machine, as represented in Fig. 6, thereby retarding the material more and more in the same measure as the quantity grows less by the removal of the fine material which is bolted out.

If preferred, the machine may be arranged horizontally, and the movement of the material from the head to the tail of the machine may be effected solely by the deflecting-boards *o*. The material to be bolted or separated is fed into the meal-chamber C through the feed-spout *g*, or in any other suitable manner.

The machine represented in the drawings, being provided with a screen and air-trunk drawing an air-current only through the coarse portion of the screen, is especially adapted to the bolting of meal and the purification of middlings at one operation or for the dusting and purification of middlings at one operation. The material, consisting of middlings, flour,

bran, and impurities, is elevated from the rounded bottom of the meal-chamber C and caused to flow repeatedly over the inclined screen. In passing over the finer portions of the screen the flour is bolted through the screen and separated from the middlings, bran, and impurities which remain in the meal-chamber. When the flour has been thoroughly removed, the middlings, &c., reach the coarse section *b'* of the screen, through which the air-current passes in an upward direction. This air-current operates to remove the light impurities, while the purified middlings are bolted through the section *b'* of the screen. The light impurities are carried off with the air-current through the spout *i* and fan I, and the bran and heavier impurities are tailed off through an opening formed in the end wall of the casing A, near its bottom, at the tail end of the machine. By properly adjusting the deflecting-boards the material can be retained on the coarse section or purifying section of the screen as long as may be necessary in order to effect the desired purification.

It is obvious that the air-current may be directed through the screen by a blast-fan instead of a suction-fan, if preferred.

I do not claim in this application anything claimed in my application No. 114,264, filed December 12, 1883.

I claim as my invention—

1. The combination, with an inclined screen, of an air trunk and fan, whereby an air-current is directed upwardly through the screen, an elevator whereby the material escaping from the lower end of the screen is returned to its upper end, and means whereby the material is caused to move laterally across the screen, substantially as set forth.

2. The combination, with a screen having the proper pitch or inclination to cause the material to flow over it by gravity, of an air trunk and fan whereby an air-current is directed upwardly through the screen, and an elevator whereby the material escaping from the lower end of the screen is returned to its upper end, substantially as set forth.

3. The combination, with an inclined screen, of an elevating mechanism facing the screen, and an air trunk and fan whereby an air-current is caused to pass upwardly through the screen, substantially as set forth.

4. The combination, with an inclined screen, of an elevator whereby the material escaping from the lower end of the screen is returned to its upper end, means whereby a lateral motion across the screen is imparted to the material, deflecting devices whereby the movement of the material across the screen can be regulated, and an air trunk and fan whereby a current of air is caused to pass upwardly through the screen, substantially as set forth.

5. The combination, with an inclined screen and an elevator whereby the material escaping from the lower end of the screen is returned to its upper end, of an air trunk and fan

whereby an air-current is directed upwardly through a portion of the screen, substantially as set forth.

5 6. The combination, with a middlings-purifier composed of an inclined screen, an air trunk and fan whereby an air-current is directed upwardly through the screen, and an elevator whereby the material escaping from the lower end of the screen is returned to its
10 upper end, of a preliminary bolting apparatus composed of an inclined screen, and an elevator whereby the material escaping from the lower end of the screen is returned to its upper end, substantially as set forth.

15 7. In a combined bolting and purifying apparatus, the combination, with an inclined screen composed of sections of different degrees of fineness arranged side by side, of an elevator whereby the material escaping from
20 the lower end of the screen is returned to its upper end, mechanism whereby an air-current is directed upwardly through the coarse portion of the screen, and means whereby the material is caused to move laterally across the
25 screen from the fine to the coarse sections, substantially as set forth.

8. The combination, with an inclined screen, of an elevator whereby the material escaping from the lower end of the screen is returned to

its upper end, a casing inclosing the elevator 30 and screen, and an air-trunk arranged between the elevator and screen, and adapted to direct an air-current upwardly through the screen, substantially as set forth.

9. The combination, with an inclined screen, 35 of an elevator whereby the material escaping from the lower end of the screen is returned to its upper end, a casing inclosing the elevator and screen, an air-trunk arranged between the elevator and screen, and flexible strips or curtains k k' , attached to the air-trunk and resting
40 on the screen or casing, substantially as set forth.

10. The combination, with an inclined screen, of an elevator whereby the material escaping 45 from the lower end of the screen is returned to its upper end, a casing inclosing the elevator and screen, an air-trunk arranged between the elevator and screen, and adjustable deflecting-boards attached to the upper end of the air-
50 trunk, substantially as set forth.

Witness my hand this 19th day of November, 1883.

ORVILLE M. MORSE.

Witnesses:

JNO. G. MUNDY,
CHAS. F. GEYER.