

No. 615,524.

Patented Dec. 6, 1898.

F. BRANDSTAEDTER.  
SCREENING OR BOLTING MACHINE.

(Application filed Nov. 26, 1897.)

(No Model.)

Fig. 1.

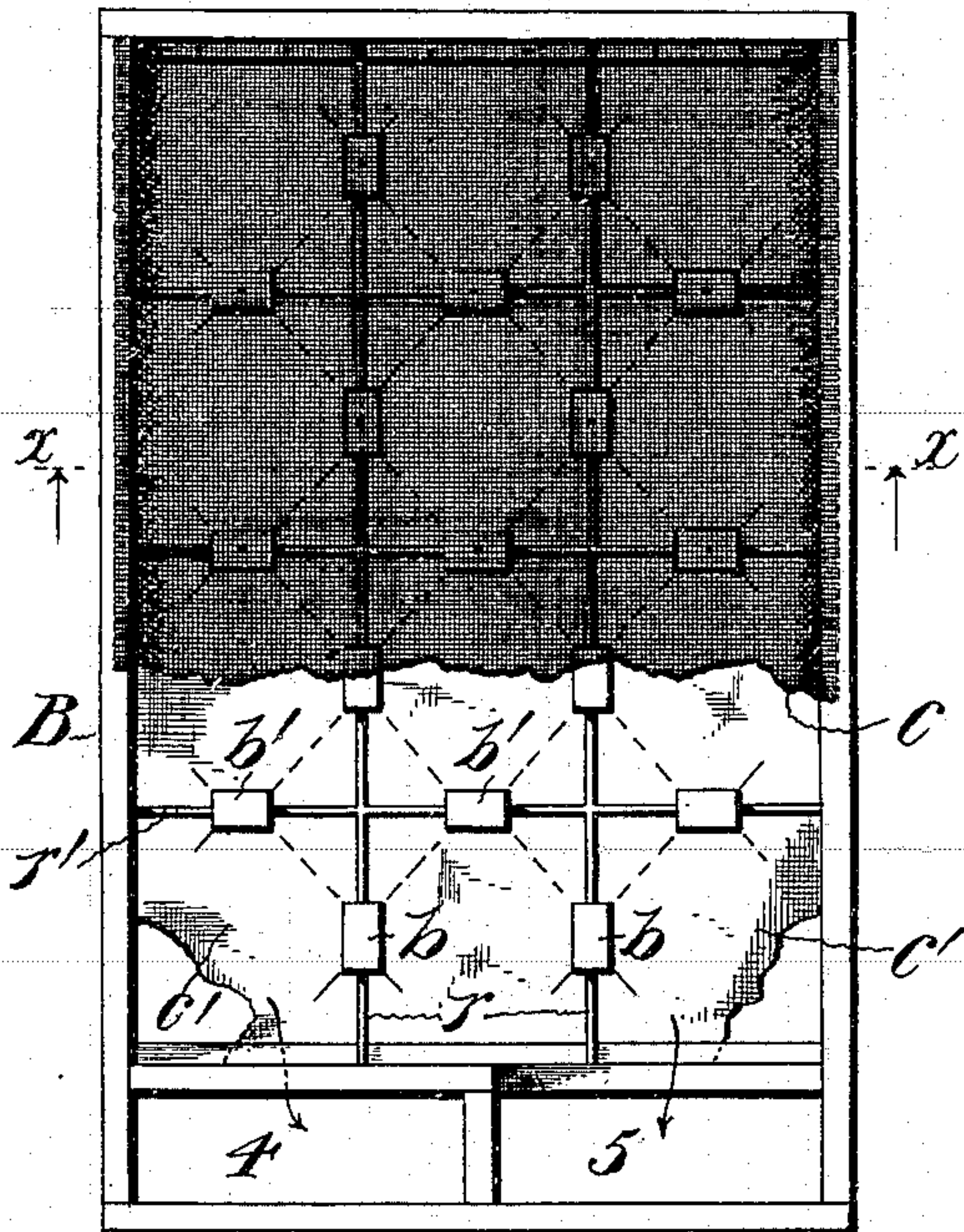


Fig. 2.

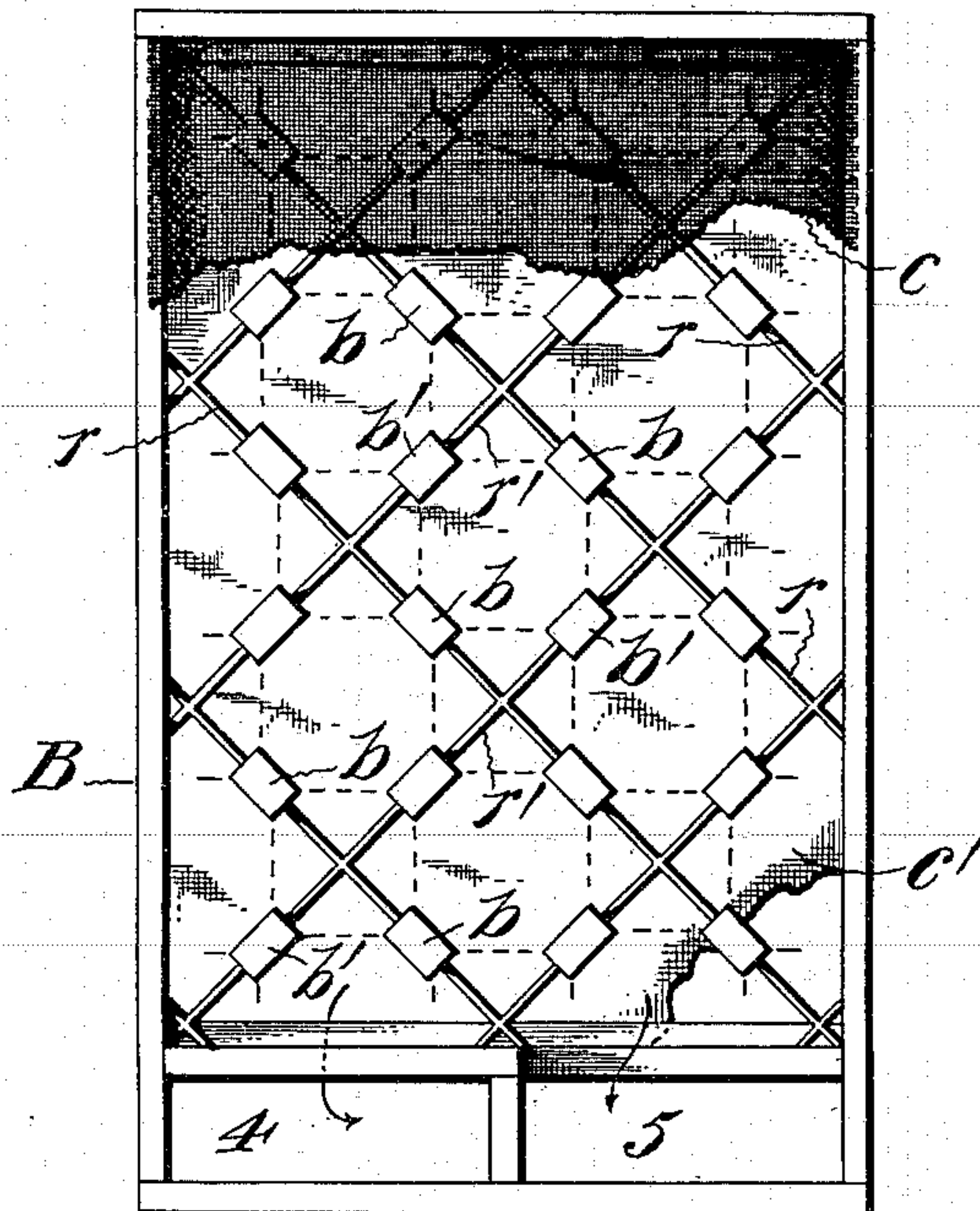


Fig. 3.

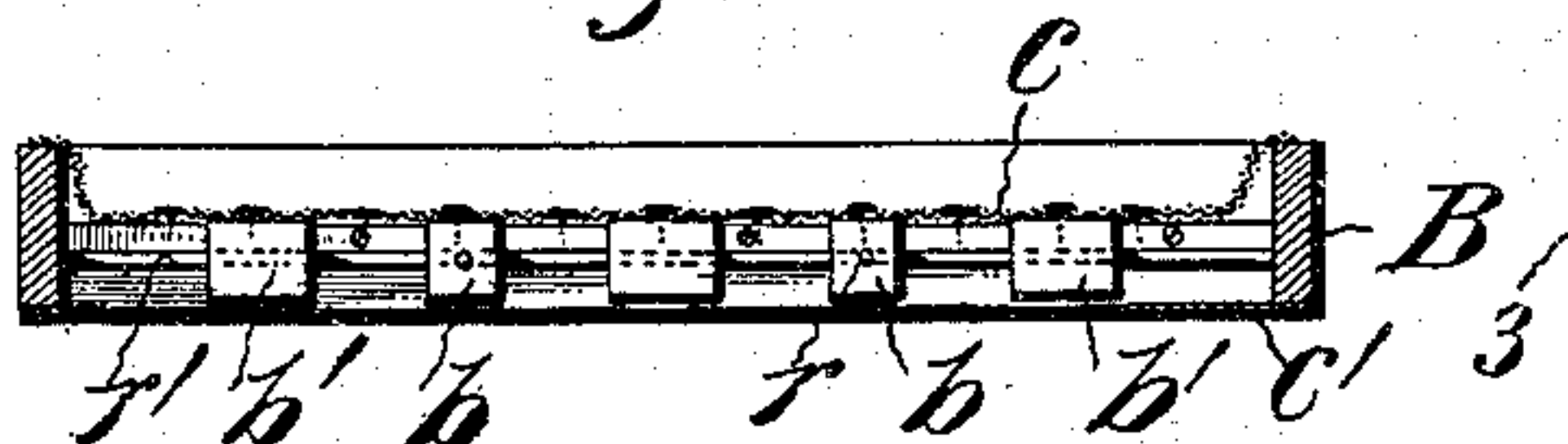


Fig. 4.

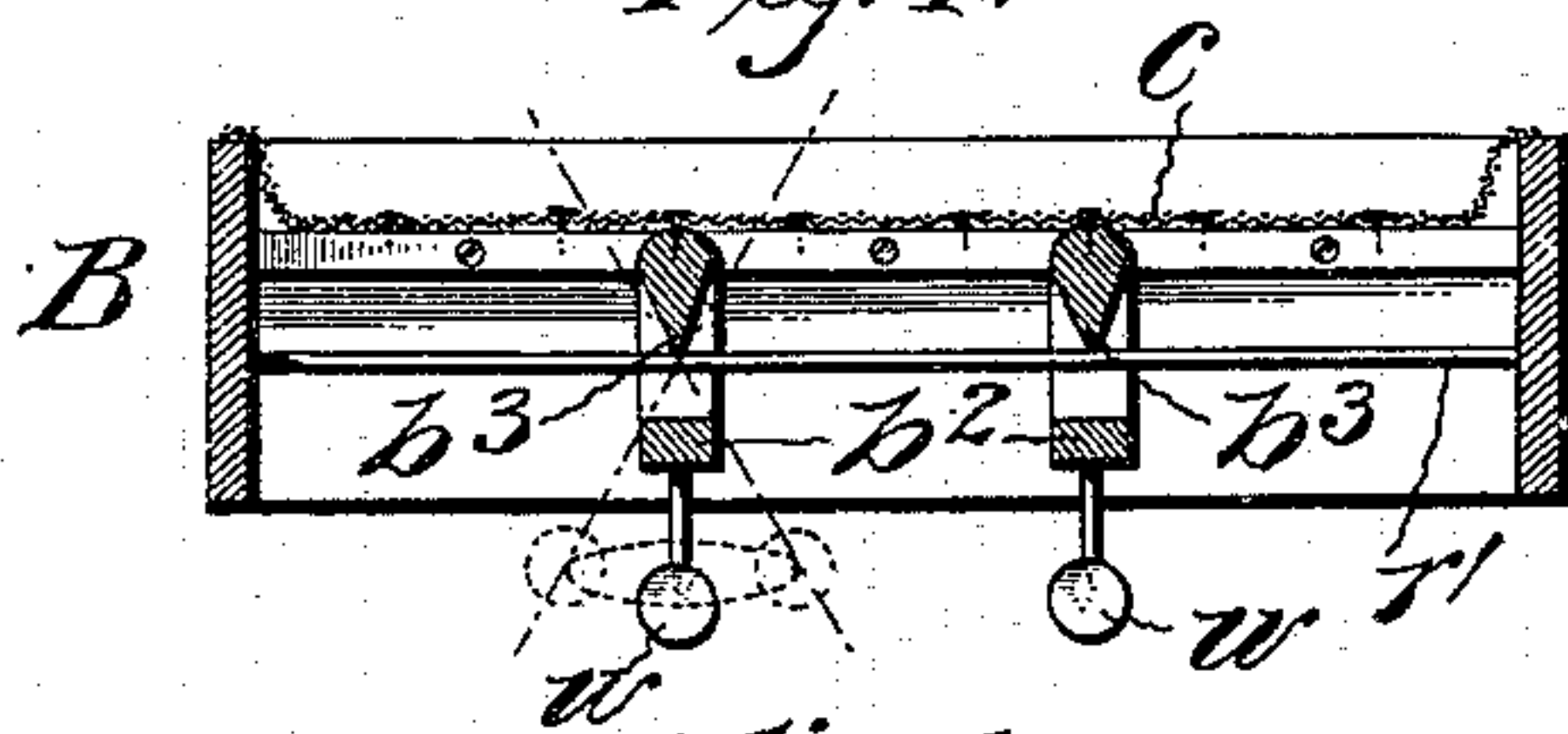


Fig. 5.

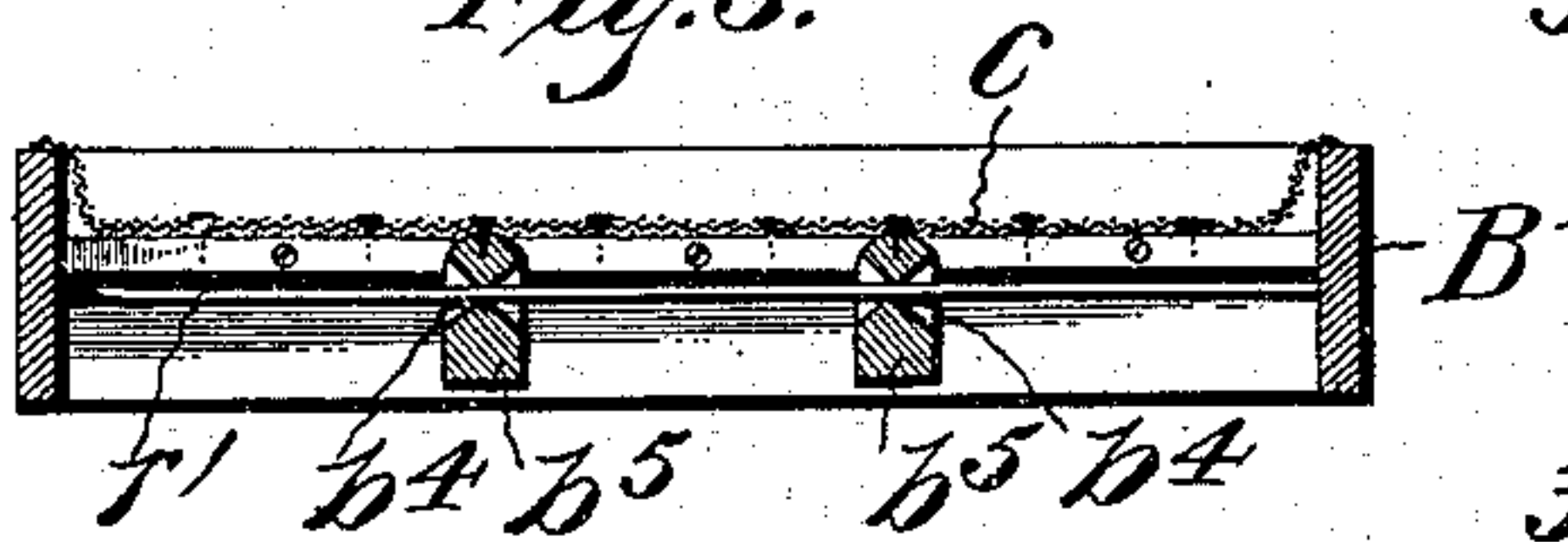


Fig. 8.

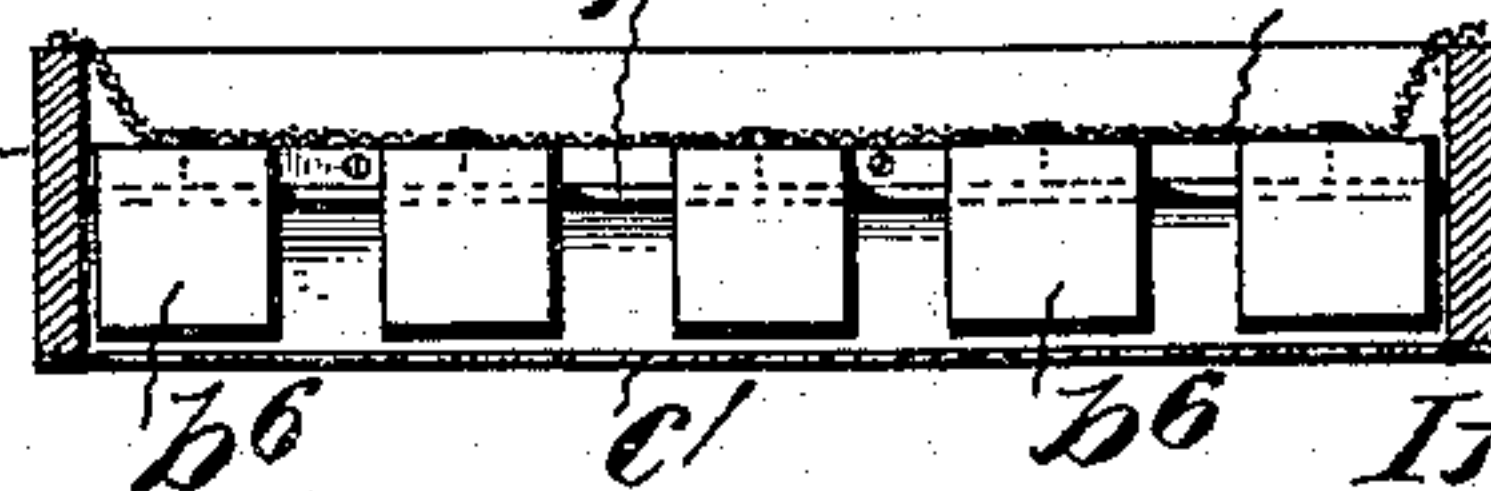


Fig. 6.

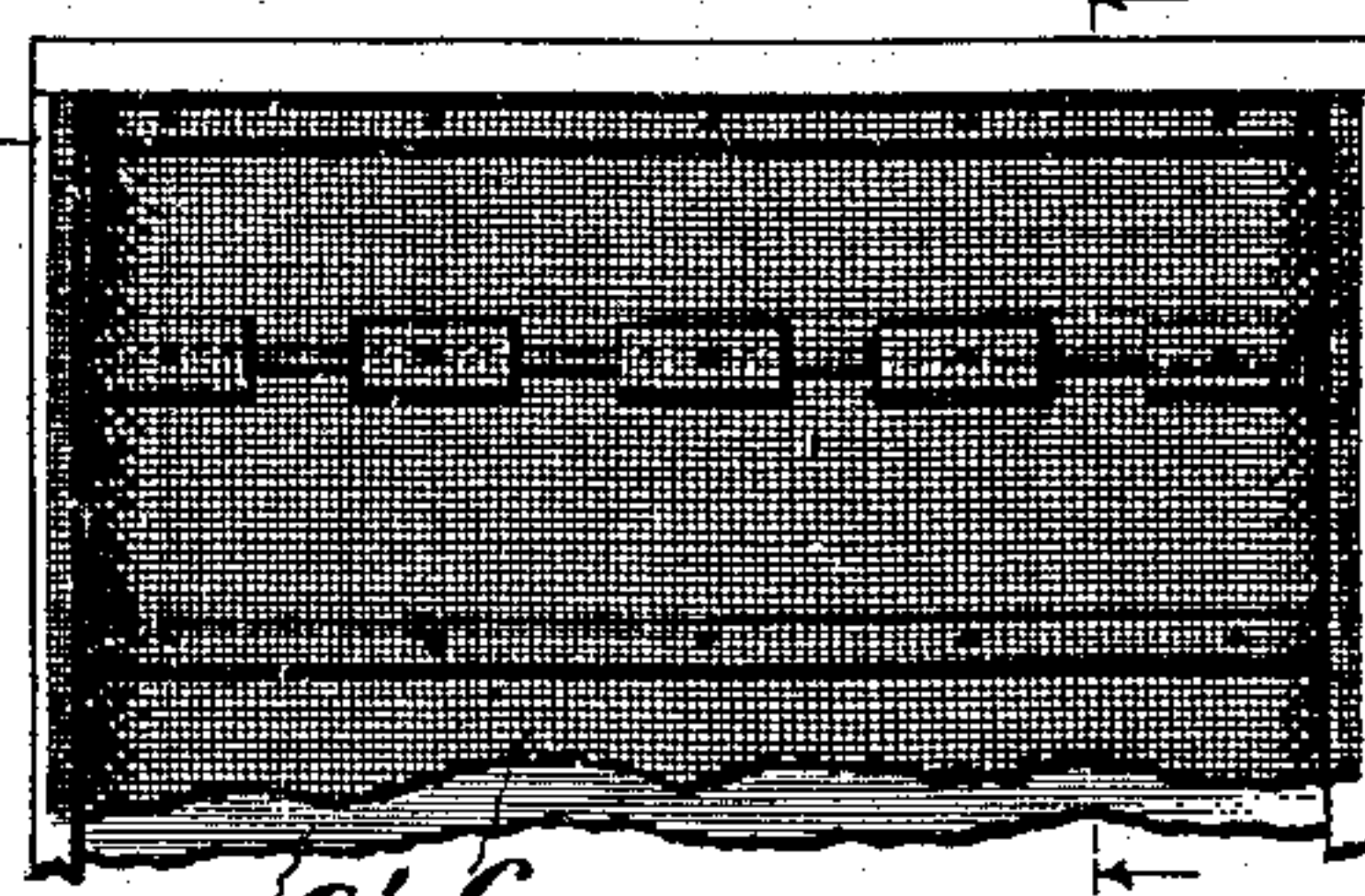


Fig. 7.

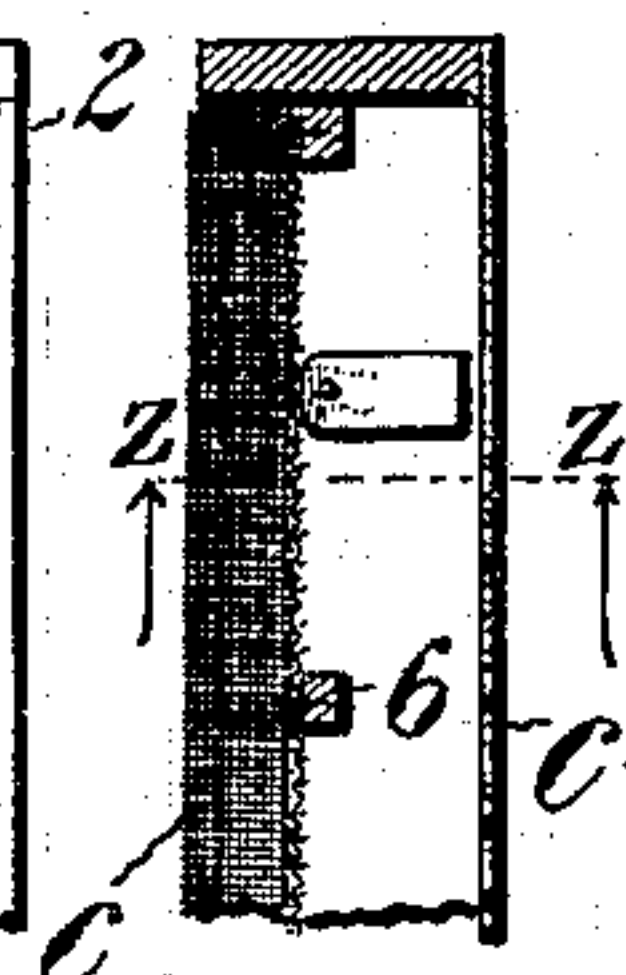
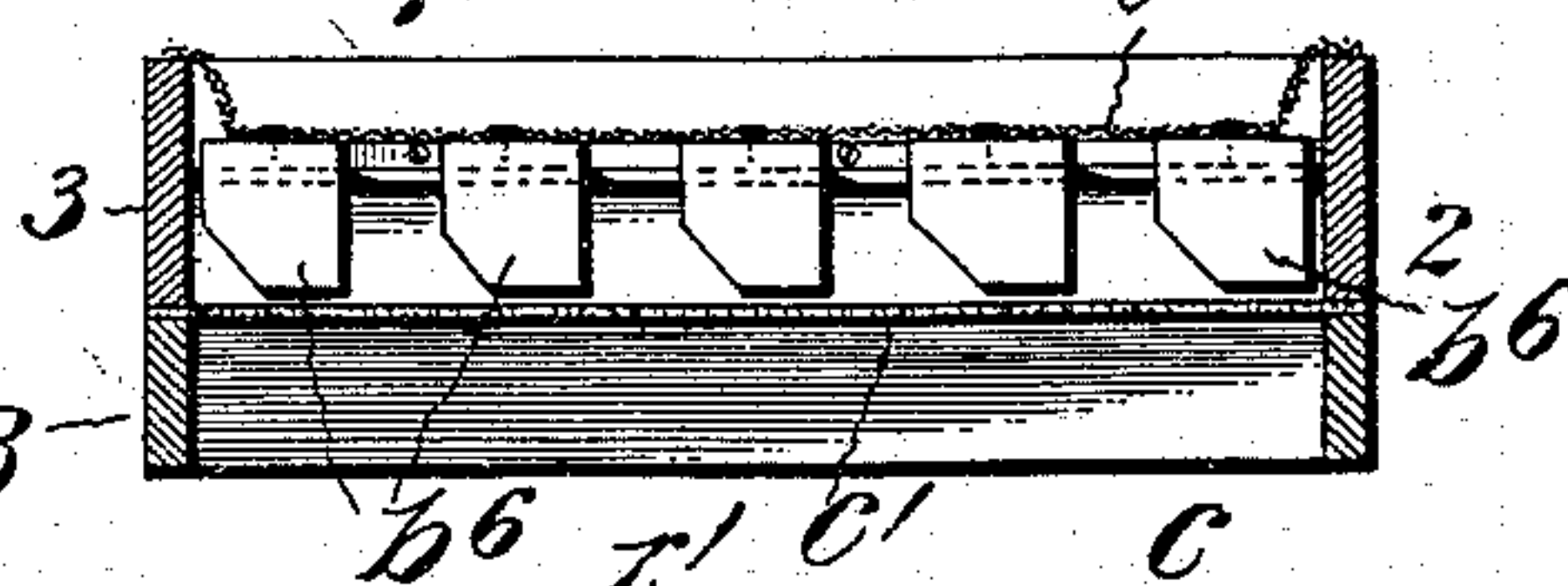


Fig. 9.



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# UNITED STATES PATENT OFFICE.

FRIEDRICH BRANDSTAEDTER, OF LOUVAIN, BELGIUM.

## SCREENING OR BOLTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 615,524, dated December 6, 1898.

Application filed November 26, 1897. Serial No. 659,884. (No model.)

*To all whom it may concern:*

Be it known that I, FRIEDRICH BRANDSTAEDTER, a subject of the King of Belgium, residing at Louvain, Belgium, have invented  
5 certain new and useful Improvements in Screening or Bolting Machines, (for which Letters Patent have been obtained in Belgium, No. 126,283, dated February 27, 1897; in England, No. 502, dated April 10, 1897;  
10 in Austria, No. 47/2,749, dated July 20, 1897; in Hungary, No. 9,246, dated August 18, 1897; in Spain, No. 20,840, dated June 22, 1897, and in France, No. 264,345, dated February 23, 1897;) and I do hereby declare the following  
15 to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters and figures of reference marked thereon, which form  
20 a part of this specification.

In screening or bolting machines, especially in machines for screening finely-pulverized materials, as middlings or flour from finely-  
25 ground cereals, the meshes of the screen or bolt cloth become readily choked by material lodging therein, as is well known, and various means have been employed and suggested for the purpose of avoiding this. Among  
30 others it has been proposed to so mount the cloth that at each movement of the screen or bolt the cloth is alternately slackened and stretched in one direction—namely, lengthwise of the bolt—whereby a shaking motion  
35 in a direction perpendicular to the motion of the screen or bolt is imparted to the cloth and the meshes thereof more or less elongated or drawn out in one direction. This and other means hitherto resorted to have been but partially successful in preventing the choking  
40 up of the screen or bolt cloth meshes.

The object of this invention is to provide simple means whereby the cloth is alternately slackened and stretched in different directions—*i. e.*, both lengthwise and crosswise or  
45 in other directions, as in planes diagonal to the surface of the bolt, whereby the meshes are contracted and again expanded first in one direction or in the plane of two opposite  
50 sides of the mesh and then in an opposite direction or in the plane of the other two sides or in the direction of the angles of the meshes, so that the ground material passing through said meshes is effectually prevented from lodg-

ing therein. The contraction and expansion of 55 the meshes in different directions are of course due to variations in different directions in the tension of the screen or bolt cloth or at different points of its surface, the invention being of special advantage when applied to  
60 horizontally oscillating, reciprocating, or gyrating screens or bolts. An oscillatory, reciprocating, or gyrating motion is or may be imparted to the bolt by mechanism so well known as to require neither description nor  
65 illustration.

The invention has for its further object to utilize the devices for preventing the screen or bolt cloth meshes from choking up as a means for forwarding the screened material  
70 along a second screen or bolt cloth or along a collecting board or table.

Referring to the accompanying drawings, Figures 1 and 2 are top plan views of a screen or bolt, illustrating different arrangements of  
75 the devices for keeping the cloth-meshes clear. Fig. 3 is a cross-section on line *xx* of Fig. 1. Figs. 4 and 5 are cross-sectional views of a screen or bolt, illustrating modifications in the construction of the devices for keeping  
80 the cloth-meshes clear. Fig. 6 is a fragmentary top plan view of a portion of a screen or bolt in which the devices for keeping the cloth-meshes clear are utilized to forward the material passing through said screen along  
85 a second screen or along a collecting-board. Fig. 7 is a longitudinal section on line *yy* of Fig. 6. Fig. 8 is a cross-section on line *zz* of said Fig. 7, and Fig. 9 is also a cross-section illustrating a modification in the construction  
90 of the devices for keeping the meshes of the screen or bolt cloth clear and for forwarding the material passing therethrough along a second screen or collecting-board.

As hereinabove stated, the invention consists, essentially, in varying the tension of a  
95 screen or bolt cloth at different points of its surface by imparting to such cloth at such different points alternating slackening and stretching movements in directions at right  
100 angles to each other, either crosswise and longitudinally or diagonally of the bolt-cloth. Thus, for instance, the screen or bolt cloth at a given point of its surface may partake of the movements of the screen or bolt in a  
105 given direction, while at another point of its surface the cloth is caused to move in different or opposite directions, whereby variations



of tension at different points are produced naturally in such manner that at certain points the cloth will be slackened and at others stretched in different directions. This I attain by connecting with the cloth at different points of its surface bodies sufficiently heavy relatively to the cloth, and instead of allowing them to partake of the general movements of the bolt or screen I compel them to move in definite directions, differing from or corresponding with and differing from the said general direction of motion of the screen or bolt. To attain these results, the bolt-cloth is not stretched taut on the bolt-frame, but is more or less slack, as may be readily comprehended.

Although the arrangements of the weights is symmetrical, generally speaking, yet this arrangement can be varied. Thus, for instance, in Fig. 1 I have shown a screen or bolt B, in which the series of weights—as, for instance, small blocks of wood  $b\ b'$ —are secured to the under face of the cloth  $c$ , so that the series of blocks  $b$  will have motion longitudinally of the cloth on wires or rods  $r$ , secured to the screen or bolt frame, while the series of blocks  $b'$ , threaded on wires or rods  $r'$ , have motion transversely of the screen or bolt. Inasmuch as the rods or wires  $r$  and  $r'$  are rigidly connected with the ends and sides, respectively, of said screen or bolt frame B, the blocks  $b$  and  $b'$  instead of partaking of the oscillating movements of the screen or bolt will receive motion longitudinally and crosswise of the bolt-cloth  $c$ , respectively, and as said blocks are rigidly connected with the said cloth and are also free to vibrate on their rods the tension of the cloth will be varied at as many points as said cloth is connected with said blocks, or, in other words, the cloth will be alternately slackened and drawn taut at many points of its surface and in different directions, according to the direction of motion of the bolt or screen, so that the meshes of the cloth thereof assume a rhomboidal form when said cloth is drawn taut, as indicated in dotted lines in Fig. 1. If, on the other hand, the supporting wires or rods  $r\ r'$  are arranged in diagonally-intersecting planes, the meshes of the cloth are alternately enlarged and contracted at numerous points, according to the direction of oscillation of the screen or bolt frame B. Of course it will be readily seen that the same results can be obtained with a bolt having a gyrating or a reciprocating motion.

Instead of threading the blocks  $b$  and  $b'$  upon their respective wires or rods  $r$  and  $r'$  said blocks may be arranged so as to have a rocking motion on substantially-fixed points on said wires or rods, and to this end I provide the blocks  $b^2$  with a knife-edge bearing  $b^3$ , Fig. 4, and with a balancing-weight  $w$ , the variations in the tension of the cloth  $c$  at different points being here due to the oscillating or rocking motion instead of the to-and-fro sliding motion of the blocks. The same re-

sults are obtained by combining the sliding and rocking movements of the blocks by simply providing said blocks  $b^3$  with two knife-edge bearings  $b^4\ b^4$ , between which the wire or rod  $r$  or  $r'$  passes, Fig. 5, whereby the friction between the blocks and their supports is at the same time reduced to a minimum.

It is furthermore obvious that instead of arranging the blocks  $b\ b'$  on the under side of the cloth  $c$  they may with like results be arranged on the upper face of such cloth.

As previously stated, the invention comprises the utilization of the more or less heavy bodies or blocks as a means for forwarding the material passing through the screen or bolt cloth  $c$  onto a screen or collecting or gathering board  $c'$  below. To this end the transverse rows of blocks  $b^6$  are made of such length that their lower edges will lie proximate to said lower screen or gathering-board  $c'$ , and said blocks are so connected with the cloth  $c$  as that the end blocks of the several rows lie close to one of the side bars—as, for instance, the right-hand side bar 2 of the screen or bolt frame B, Figs. 6 and 8—while the edges of said blocks  $b^6$  facing the opposite side bar 3 of said frame may be beveled, as shown in Fig. 9, to increase the distance or space between each two blocks when this becomes necessary or when the meshes of the cloth are such as to allow comparatively large quantities of the material to pass there-through; but when the meshes of the cloth are very fine this beveling of the edges of the blocks is not necessary.

It is evident that when the bolt or screen has a circular oscillating motion in one direction the material on the lower screen or the gathering-board  $c'$  will partake of this movement and will be thrown or caused to move, say, from the side 2 of the screen or bolt frame to the opposite side 3, a portion of the material moving lengthwise of the lower screen through the passages formed between the blocks  $b^6$ . When, on the contrary, the screen or board  $c'$  oscillates in an opposite direction, the material between the rows of blocks is moved back toward the side 2 of the screen or bolt frame B, but cannot move along said side because of the proximity thereto of the end blocks of the transverse rows of such and because there is a greater number of passages on one side of the longitudinal center of the screen or bolt than on the other, so that a greater portion of the material is caused to move along  $c'$  in one direction than in the other, whereby said material is gradually forwarded from the feed end of the bolt to the discharge-throat 4 of the cloth or board  $c'$ , the tailings passing from the cloth  $c$  to a separate discharge-throat 5, Figs. 1 and 2, or, in other words, the quantity of material moving in the direction of said delivery end 4 is greater than the quantity of material moving in an opposite direction, as will be readily understood.

The weights—i. e., the blocks  $b\ b'$ , &c.—



may be secured to the bolt-cloth *c* in any desired manner, as by cementing, gluing, or tacking.

In bolts of considerable superficial area the cloth will be subjected to great strain at different points in different directions, which might result in injury. This may be avoided by interposing between two or more rows of weights strips 6, secured to the bolt-frame, and to which the cloth *c* is likewise secured.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. The combination with the cloth of a screen or bolt adapted to receive a screening or bolting motion; of means adapted to impart to said cloth horizontal to-and-fro movements in different planes at different points of its surface when the bolt is in motion, for the purpose set forth.

2. The combination with the cloth of a screen or bolt adapted to receive a screening or bolting motion, of means adapted to act upon the cloth to alternately stretch and slacken the same in different planes at different points of its surface when the bolt is in motion, for the purpose set forth.

3. The combination with the cloth of a screen or bolt adapted to receive a screening or bolting motion, of means connected with the cloth at different points of its surface and adapted to alternately stretch and slacken the same in planes angular to one another when the bolt is in motion, for the purpose set forth.

4. The combination with the cloth of a screen or bolt adapted to receive a screening or bolting motion, of means for alternately slackening and stretching the cloth at different points of its surface in planes angular to one another, for the purpose set forth.

5. The combination with the cloth of a screen or bolt adapted to receive a screening or bolting motion, of weights arranged to act upon the cloth at different points of its surface to alternately slacken and stretch the cloth in planes angular to one another, for the purpose set forth.

6. The combination with the cloth of a screen or bolt adapted to receive a screening or bolting motion, of weights attached to the cloth and adapted to alternately slacken and stretch the same at different points of its surface and in planes angular to one another, for the purpose set forth.

7. The combination with the cloth of a screen or bolt adapted to receive a screening or bolting motion, of means for alternately slackening and stretching the cloth in directions differing from each other and from the direction of motion of the screen or bolt, for the purpose set forth.

8. The combination with the cloth of a screen or bolt adapted to receive a screening or bolting motion, of means connected with said cloth and adapted to alternately slacken and stretch the same at different points of

its surface in directions differing from one another and from the direction of motion of the screen or bolt, for the purpose set forth.

9. The combination with a screen or bolt, of weights attached to the cloth at different points of its surface, and supports for and on which said weights have sliding motion, said supports rigidly connected with the screen or bolt frame, for the purpose set forth.

10. The combination with a screen or bolt, of weights attached to the cloth at different points of its surface, and supports for and on which said weights have sliding and oscillating motion, said supports rigidly connected with the screen or bolt frame, for the purpose set forth.

11. The combination with a screen or bolt, and rods rigidly connected with its frame and arranged in intersecting planes, of weights having sliding and rocking motion on said rods, said weights attached to the bolt cloth at different points of its surface, for the purpose set forth.

12. The combination with a screen or bolt, and a receiver for the screened or bolted material secured to the bolt-frame below the bolt-cloth, of weights attached to the under side of the cloth with their free ends close to the surface of said receiver, said weights arranged in transverse rows so as to leave a space between each two weights and between the last of a row and one side of the bolt-frame, said weights adapted to receive a vibrating motion in one direction and a to-and-fro motion in a direction at right angles thereto, for the purpose set forth.

13. The combination with a screen or bolt, and a receiver for the screened or bolted material secured to the bolt-frame below the cloth, and rods secured to said frame in transverse rows between the cloth and receiver; of plate-like weights attached to the under side of the cloth and supported from and having motion on said rods, said weights arranged to leave a space between them and between the last of a row and one side of the bolt-frame, for the purposes set forth.

14. The combination with a screen or bolt and a receiver for the screened or bolted material secured to the bolt-frame below the cloth, and rods secured to said frame in transverse rows between the cloth and receiver; of plate-like weights attached to the under side of the cloth and supported from and having a to-and-fro and an oscillating motion on said rods, said weights arranged to leave a space between them and between the last of a row and one side of the bolt-frame, for the purposes set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

FRIEDRICH BRANDSTAEDTER.

Witnesses:

HENRI RASTODI,

EDOUARD LABAUN.