

No. 685,132.

Patented Oct. 22, 1901.

L. GRAF.  
BOLTING APPARATUS.  
(Application filed Aug. 14, 1900.)

(No Model.)

Fig. 1

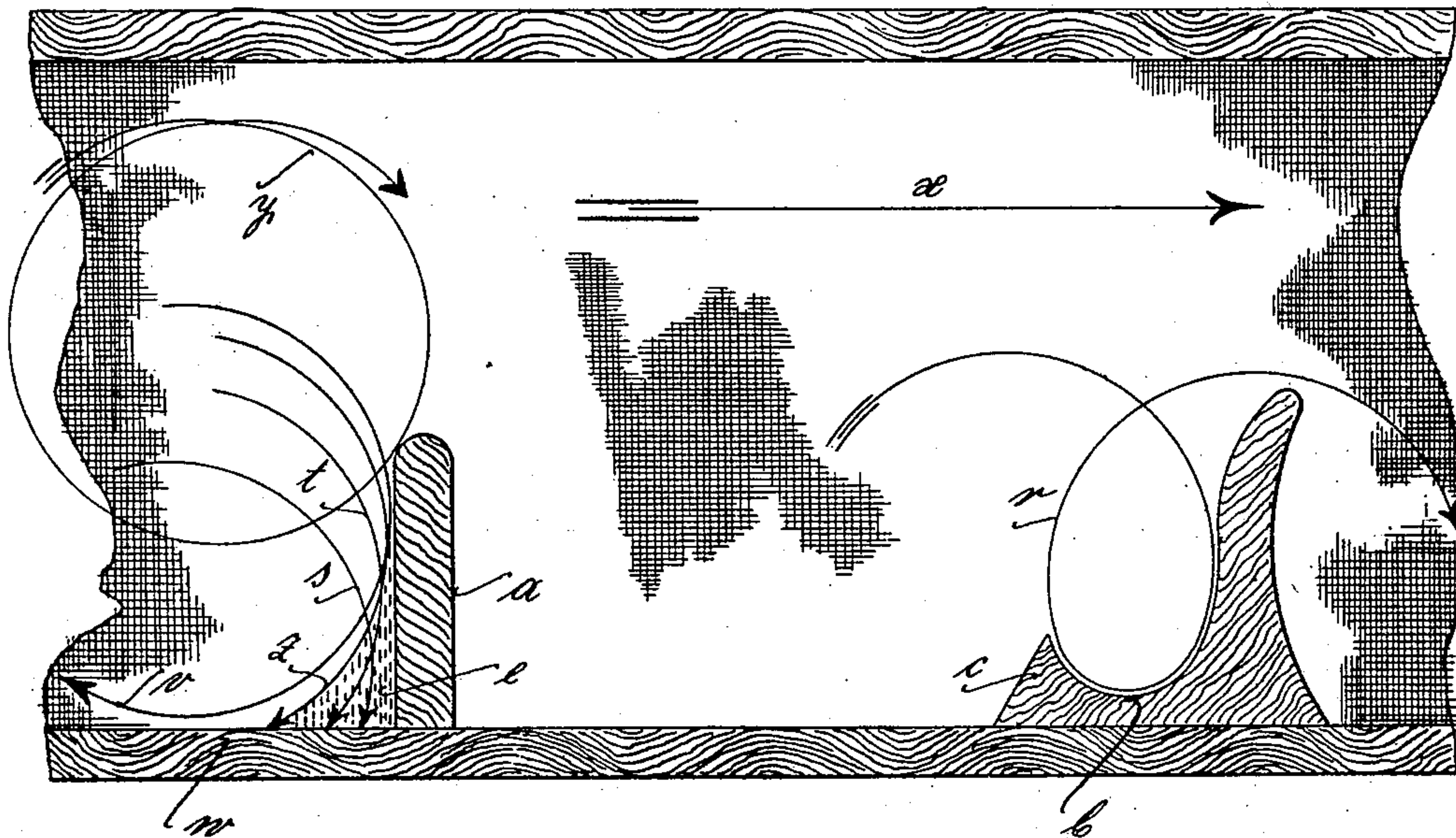
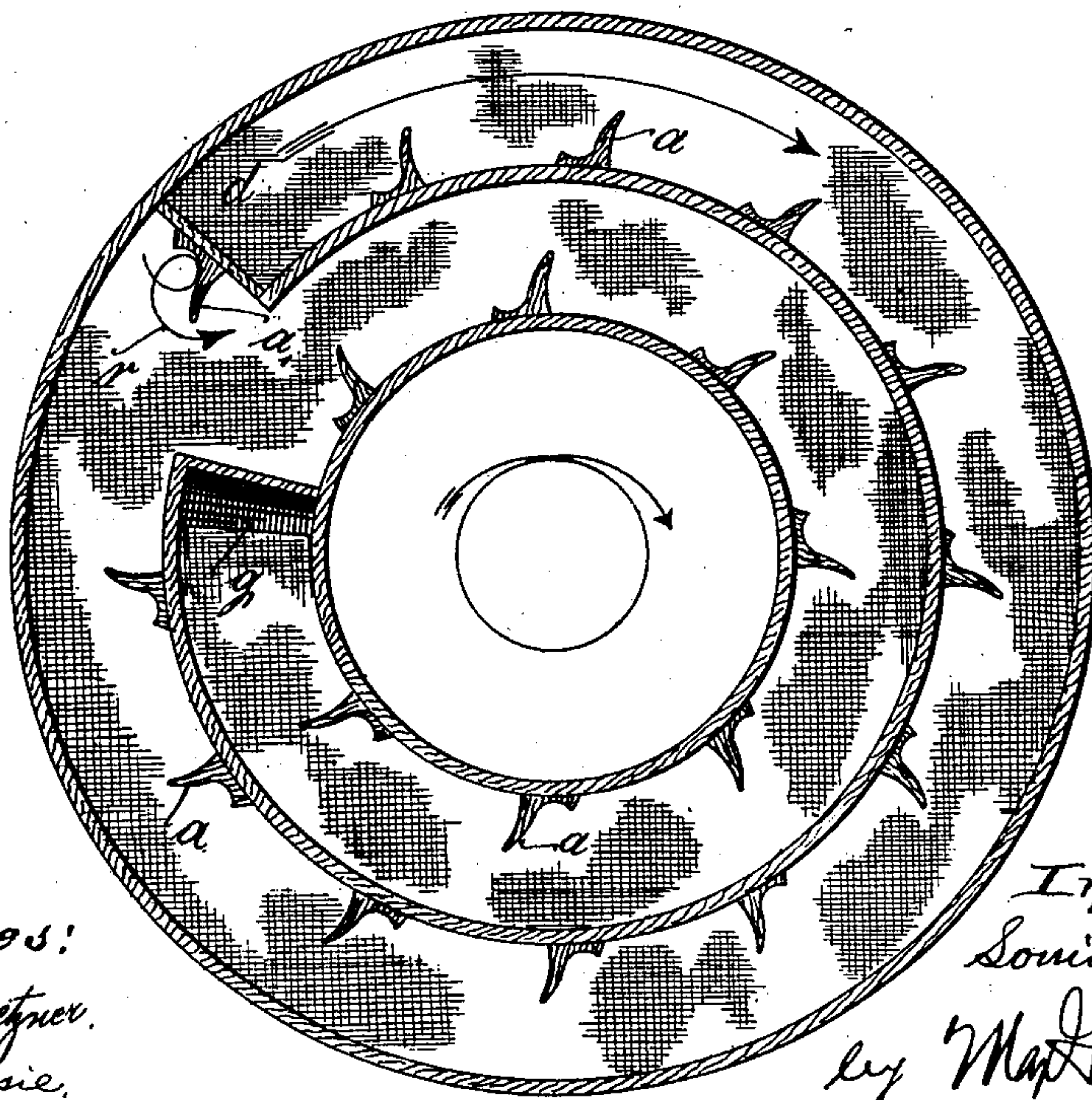


Fig. 2



Witnesses:  
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# UNITED STATES PATENT OFFICE.

LOUIS GRAF, OF MUNICH, GERMANY.

## BOLTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 685,132, dated October 22, 1901.

Application filed August 14, 1900. Serial No. 26,812. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS GRAF, obermüller, a citizen of Bavaria, Germany, residing at Munich, Bavaria, Germany, (whose post-office address is Wienerstrasse 15,) have invented certain new and useful Improvements in Bolt-  
5 ing Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable  
10 others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in bolting apparatus of the class known as "gyratory" bolts, and in particular to the construction of the transporting-blades for use  
15 in such bolts.

The object of my invention is to avoid the accumulation or deposit in the corners between the blades and the sieve-frame to which they are attached of portions of the material  
20 being bolted or sieved.

With this object in view my invention consists in the features, details of construction, and combination of parts, which will first be  
25 described in connection with the accompanying drawings and then particularly pointed out in the claims.

In the drawings, Figure 1 is a broken plan view of a rectangular sieve shown as provided  
30 with a series of transporting-blades embodying my invention and with one old form of transporting-blade for the purpose of rendering clear the description of the advantages of my invention, and Fig. 2 a plan view of a circular sieve embodying my invention.  
35

Referring to the drawings and in particular to Fig. 1, *a* represents one of the old forms of transporting-blades, consisting of a ledge straight on the back surface—that is to say,  
40 on that surface which faces in a direction opposite to the travel of the material to be sifted. Such blades offer a flat surface to the material thrown against them, in the direction of the arrow *x*, by the gyratory motion of the  
45 bolting apparatus, aided by the action of the blade in advance of the one under consideration. Consequently a recoil of the material is produced, or, in other words, the material thrown against them is thrown back by the  
50 flat side of the blades. Furthermore, the corners between the blades and the sieve become filled with material, owing to the fact that the

rear straight surfaces of the blades stop the circular movement of the particles of material, which movement the particles receive  
55 from the gyratory action of the sieve.

The curved arrows *s*, *t*, *v*, *y*, and *z*, Fig. 1, indicate the general paths of the particles, the arrows *t*, *s*, and *z* indicating the direction  
60 of travel of some of the particles, which will be caught in the corners between the blades and sieve and retained there, as shown at *e*, during the gyratory movement of the sieve. This clogging of the corners of the blades re-  
65 tards the motion of the material through the apparatus, owing to the frictional action of the clogged material on the other part of the material which is being bolted. It is the aim  
70 of the present invention to overcome this disadvantage and thereby to increase the output of the apparatus. In order to accomplish this object, I construct the blades with a special form, such as is shown in cross-section in  
75 Fig. 1, where the blade *C* is shown as provided with an arm *c*, extending in a direction opposite to the general direction of travel of the material, which direction is indicated by the  
80 arrow *x*. The outer lateral face of the arm *c* is concave, while the rear face of said arm is sloped inward in the direction of the center of the passage-way for the material and in  
85 the direction of the travel of said material. The rear face of the main portion of the blade is convex, the curve joining the curve of the arm, while the inner end of said main portion  
85 of the blade is curved forward. The front wall of the blade is preferably concave, as shown.

The concave face of the arm *c* is so curved that the side *w* of the sieve will be parallel  
90 to a tangent of said curve. Furthermore, the rear portion of said concave face is of a shorter radius than that portion which joins the curve of the back of the main portion of the blade, so that said rear portion will have a tendency  
95 to throw the material toward the central portion of the sieve and beyond the edge of the main portion of the blade, as indicated by the arrow *r* in Fig. 1. Thus it will be seen from  
100 the drawings the particles of material moving generally in the direction of the arrow *x*, Fig. 1, will impinge on the back of the main portion of the blade and will either be forced toward the center of the sieve, as when it



strikes that portion of the back of the blade which slopes forward and toward the center of the sieve, or will be thrown toward the side *w* of the sieve and will then follow the curve of the arm *c* in the direction indicated by the arrow *r*, Fig. 1, until it passes the edge of the main portion of the blade. Thus by my invention the particles striking the blades will be directed into a curved path and will sweep other particles before them, being themselves assisted in their movement by the particles following, so that the movement of the material as a body will be accelerated and the same will be prevented from stopping or clogging up the corners between the sieve and blades.

It is obvious, of course, that my invention may be embodied in any desired form of sieve. For example, the sieve shown in Fig. 1 is rectangular, while in Fig. 2 I have shown one which is circular. In the latter the material to be bolted enters at *d* and passes over the blades *a*, being then thrown into the inner circle by the blade *a'*, whence it passes to the outlet *g*.

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

1. In a gyratory bolt, the combination, with a sieve, of a blade inside the sieve and having a main portion extending into the path of travel of the material to be sieved, the said blade also having a rearward-extending arm portion whose inner face is concave.

2. In a gyratory bolt, the combination, with a sieve, of a blade inside the sieve and having a main portion extending into the path of travel of the material to be sieved, the rear face of said main portion being convex, the said blade also having a rearward-extending arm portion whose inner face is concave.

3. In a gyratory bolt, the combination, with a sieve, of a blade inside the sieve and hav-

ing a main portion extending into the path of travel of the material to be sieved, the said blade also having a rearward-extending arm portion whose inner face is concave, the radius of curvature of the rear part of said inner face being smaller than that of the front part of said inner face.

4. In a gyratory bolt, the combination, with a sieve, of a blade inside the sieve and having a main portion extending into the path of travel of the material to be sieved, the rear face of said main portion being convex, the said blade also having a rearward-extending arm portion whose inner face is concave, the radius of curvature of the rear part of said inner face being smaller than that of the front part of said inner face.

5. In a gyratory bolt, the combination, with a sieve, of a blade inside the sieve and having a main portion extending into the path of travel of the material to be sieved, said main portion having its inner end curved forward and inward, the rear face of the main portion being convex, said blade also having a rearward-extending arm portion whose inner face is concave.

6. In a gyratory bolt, the combination, with a sieve, of a blade inside the sieve and having a main portion extending into the path of travel of the material to be sieved, said main portion having its inner end curved forward and inward, the rear face of the main portion being convex, said blade also having a rearward-extending arm portion whose inner face is concave, the radius of curvature of the rear part of said inner face being smaller than that of the front part of said inner face.

In testimony whereof I affix my signature in presence of two witnesses.

LOUIS GRAF.

Witnesses:

GEORGE P. BURNS,  
WALLY SEITZ.