

P. W. GATES.

SCREENING AND ASSORTING MACHINE FOR STONE BREAKERS AND
CRUSHERS.

No. 266,282.

Patented Oct. 24, 1882.

Fig 1.

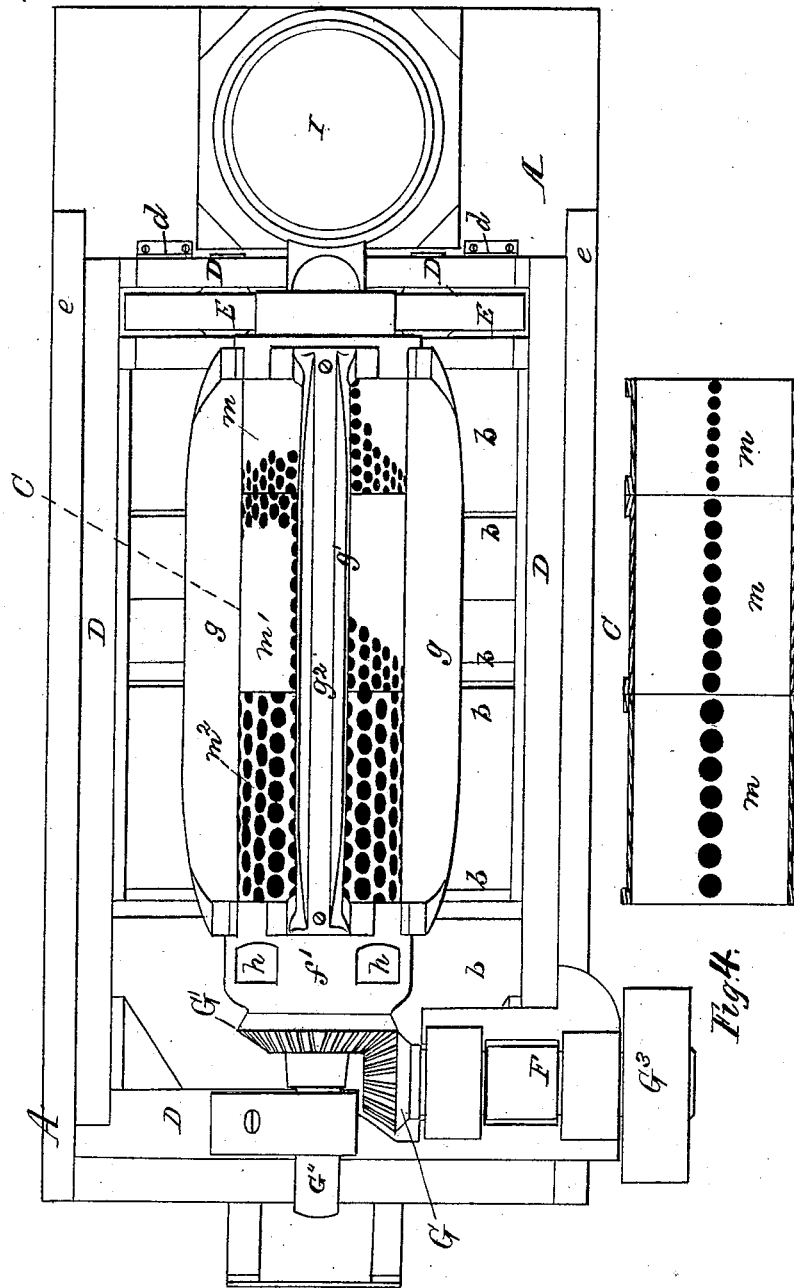


Fig 4.

Witnesses:

Robt L Fenwick
Robt L Fenwick

Inventor:

Philetus W Gates
by his attys
Fenwick & Lawrence

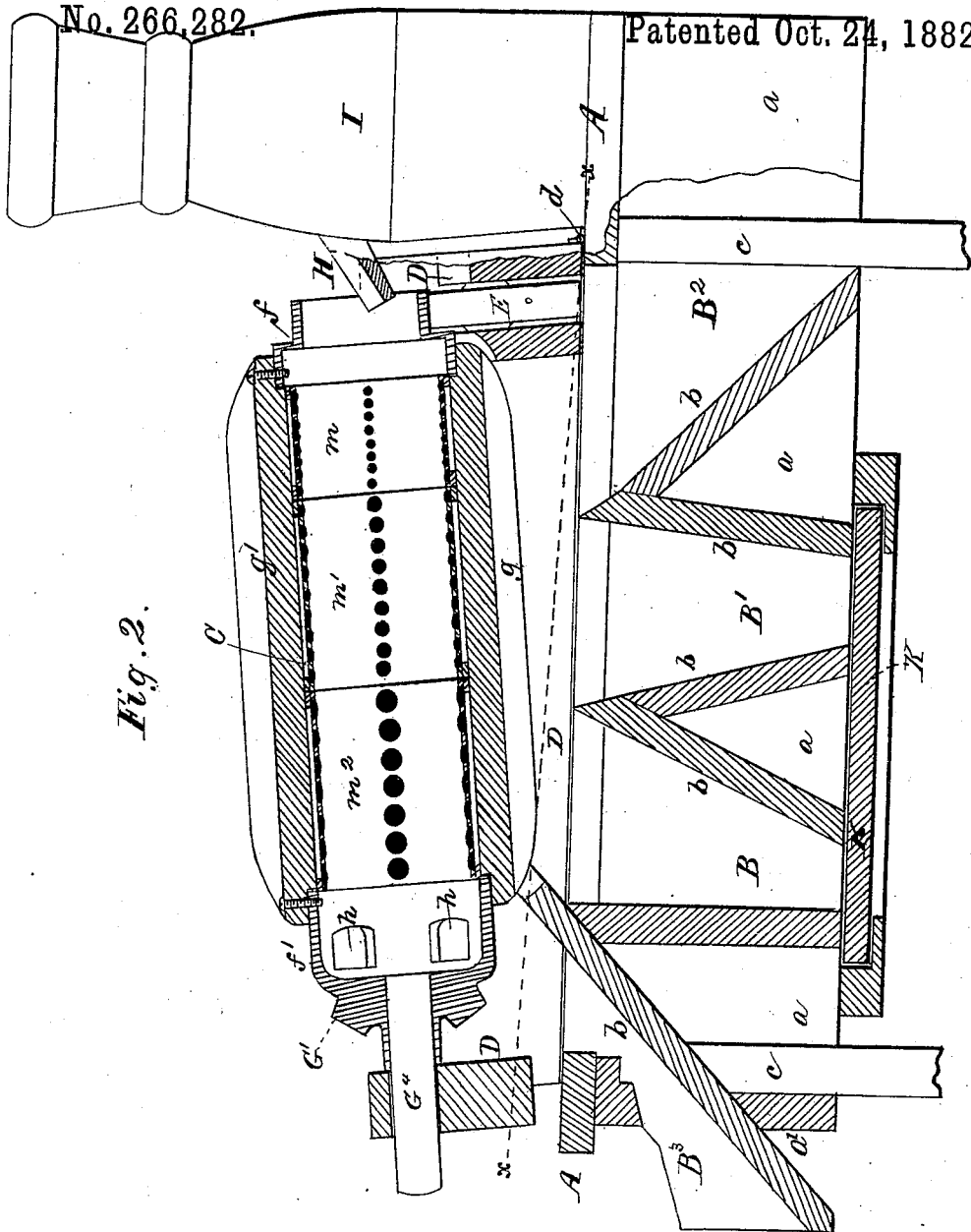
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Fig. 2.



Witnesses

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Philetus W. Gates.
by his Atty.
Fenwick & Lawrence.

(No Model.)

3 Sheets—Sheet 3.

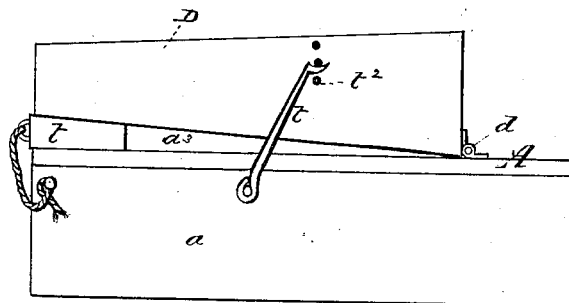
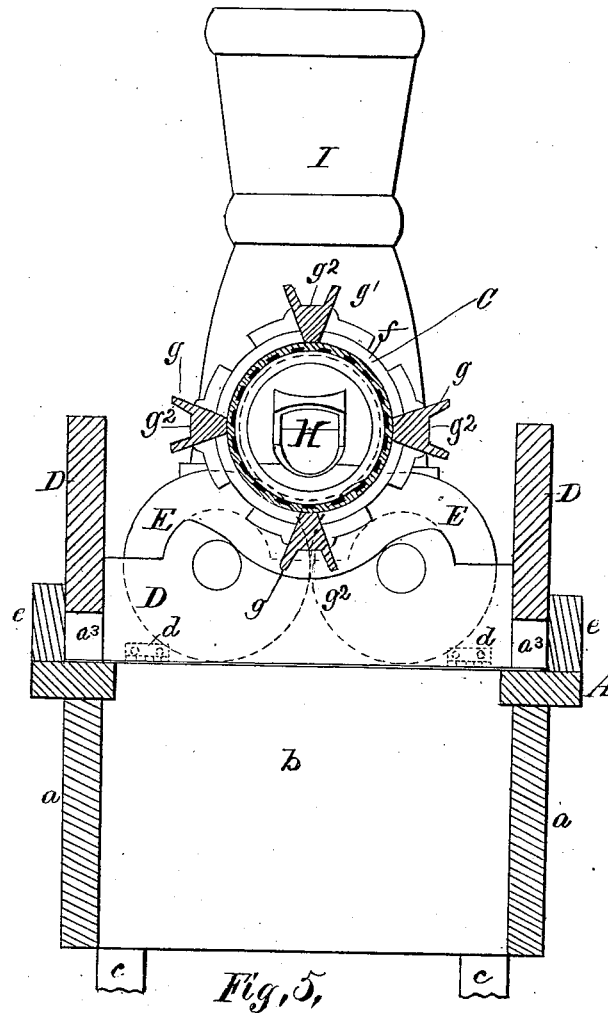
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Fig. 3.



Witnesses:

G. C. Fenwick.
Robt L. Fenwick

Inventor,

Philetus W. Gates
by his Attys
Fenwick & Lawrence

UNITED STATES PATENT OFFICE.

PHILETUS W. GATES, OF CHICAGO, ILLINOIS.

SCREENING AND ASSORTING MACHINE FOR STONE BREAKERS AND CRUSHERS.

SPECIFICATION forming part of Letters Patent No. 266,282, dated October 24, 1882.

Application filed August 18, 1882. (No model.)

To all whom it may concern:

Be it known that I, PHILETUS W. GATES, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Screening and Assorting Machine for Stone Breakers and Crushers, of which the following is a specification.

My invention consists in certain novel constructions and combinations of parts in a screening and assorting machine, as herein-after described and specifically claimed, whereby increased utility of such machines, when used in connection with stone breakers and crushers and with other machines, is secured.

In operating with revolving screens of stone breakers and crushers it is often found desirable to change the screening-surfaces from one size mesh to another; also to remove worn-out portions of the screening-surface and replace them with new ones; also, when an intermediate size of mesh is not required in the screening operation, to remove such portion and put in a blank surface between a front and rear portion of screening-surface.

Under the constructions and combinations which I have devised an entire screening-surface with front, middle, and end portions having different gage of mesh can be employed; or the middle portion may be removed and a blank section set in its place; or the end section can be set in place of the middle section; or the front and middle sections can be removed and the end section set in place of the front section, and under all the changes the substances will be properly assorted and discharged into bins or receptacles. It is found that sometimes it is only desirable to take out the dust. In such case only the front section of screening-surface would be required, and with this screening-surface a middle blank section to carry the substances to a bin below as far as required, or both the middle and end blank sections for carrying them to the discharging end of the screen, would be employed. Sometimes it is necessary to screen fine or close by discharging slower, while at other times it is desired to avoid this by discharging faster, and under the constructions and combinations which I have devised the screen can be raised,

with its gearing attached, and thereby caused to discharge slower, and again lowered to discharge faster.

In the accompanying drawings, Figure 1 is a plan view of my improved screening-machine arranged in contiguity with a crushing-machine, and showing the screen-frame as adjusted to a horizontal plane. Fig. 2 is a longitudinal section, and Fig. 3 a transverse section, of the machine, showing the screening-frame adjusted as in Fig. 1; and Fig. 4 is a side elevation of the cylindrical screen sections detached from the hinged frame. Fig. 5 is a side elevation of parts of the machine, showing two devices by which the hinged frame in which the revolving screen is applied can be set and held at different inclinations, one device being wedges hung to the sides of the supporting-frame and applied under the hinged frame, the other being hinged hook-bars hung to said frame and taking in between stop-pins on the sides of the hinged frame.

A represents in the drawings the foundation-frame of the machine, this consisting of an oblong structure with an opening in its top, closed sides *a a*, and a rear end, *a'*, which is closed, except at the place where the larger-sized screened substances pass out. Transversely of the sides *a a* reversely-inclined partitions *b* are placed, so as to form bins *B B'* for receiving and conducting off the different-sized substances which pass through the meshes of the screen *C*. At the forward and rear ends of the foundation-structure *A* chutes *B² B³* are provided. This structure may be provided with standards or legs *c*. Upon the foundation *A* an oblong frame, *D*, is applied, being hinged at its front end to the same, as indicated at *d*, so that its rear end may be raised to a certain extent, to give it any desired inclination to the horizontal top surface of the foundation *A*, as illustrated by dotted lines *x x* in Fig. 2. This provision for adjustment is made in order that the screening operation may be changed from fast to slow. In connection with this hinged arrangement of the frame *D* side ledges, *e*, may be formed on the sides of the foundation-structure, so that when the frame is inclined the space *a³*, which exists between the bottom edges of the frame *D* and

the upper surface of the top piece of sides *aa*, shall be closed by these ledges, and thus escape of material at the sides be prevented. These ledges may, however, be dispensed with. With-
 5 in the frame D, at its front end, two supporting friction-rollers, E, are applied, while upon its rear end a gear-shaft, F, with pulley G³ and bevel-gear wheel G, is provided. This frame supports the revolving screen C, which
 10 is constructed and arranged as follows: The screen-frame, which is skeleton in structure, is formed of two end pieces, *f f'*, and a series of ribs, *g g'*. The end piece *f* is in collar form, while the end piece *f'* is closed at its rear
 15 end, and is in cup form from said closed end. The cup portion is provided with discharging-apertures *h*, while on the solid or closed end a short shaft, G¹, with a bevel-gear wheel, G', is cast or applied, as shown, which
 20 wheel gears with the bevel-wheel G. The end pieces, *f f'*, are united together and stayed by the ribs *g*, which are guttered, as at *g*², longitudinally, so as to be strong, yet light. One or more of the ribs may be cast with the end
 25 pieces, while one or more, as *g'*, are to be made separate therefrom and fastened to the end pieces by means of screws, as shown.

The diameter of the friction-rollers is such with respect to the altitude of the lower end
 30 of the shaft carrying bevel-wheel G' that the frame D occupies an inclined position when resting on these rollers and its bevel-wheel G' is gearing with bevel-wheel G, as shown; but this inclination may be varied and the parts
 35 still remain in gear by raising the lower end of the frame from the position shown in full lines in Fig. 2 to the position indicated by the dotted line *xx* by means of wedges *t*, or hinged bars *t'* and pins *t*², as shown in Fig. 5, and
 40 when the inclination is thus changed and retained by a wedge beneath the frame or by other suitable means the discharge of the substances being screened will be much slower than when the inclination is as shown in full
 45 lines in Fig. 2.

The screen C is formed, for instance, of three cylindrical sections, *m m' m*², and these sections, as shown, have different gage of perforation or mesh over their entire surface. To
 50 insert these sections in the frame D, the rib *g'* is removed, and section *m* is inserted at the front, section *m'* at the middle, and section *m*² at the rear end of the frame, so that their respective meeting ends just abut against one
 55 another, as shown. The sections thus constructed and applied can be readily removed, and when circumstances require that section *m'* be an imperforated cylinder, such a cylinder can be substituted for it; or if it is re-
 60 quired that sections *m'* and *m*² be imperforated cylinders, this change can be made; or if it is required that only section *m* be used the other sections can be taken out; or the same if sections *m* and *m*² only are required—section *m'* can

be removed. The substances passed through 65 the screen, when constructed as shown, will pass down through the bins B B' and chute B², while the larger substances will pass through the front end of the screen, out of the passages *h* into the chute B³. 70

My screening-machine supplies a want long felt by manufacturers of stone breakers and crushers, as it can readily be adapted to the various purposes for which it is required, it serving for assorting the crushed material as 75 well as screening it of dust, the latter substance finding its escape from the screen-section *m* by means of the chute B², while the medium-sized substances will be assorted on the screen-sections *m' m*², and discharged into 80 separate receptacles through the meshes and at the end of the screen.

The substances to be screened are received from a chute, H, of a crushing-machine, I, and the screen is revolved by a band on the pulley 85 G³ of the shaft F.

A slide or a swinging device, K, may form a bottom to the bins, and by moving it properly the material can be discharged into carts or other receptacles beneath the same. 90

I have shown three cylindrical screen-sections; but the screen-frame may be adapted for containing any desired number of such sections without departing from my invention.

What I claim as my invention, and desire to 95 secure by Letters Patent, is—

1. In a screening and assorting machine for stone breakers and crushers, the combination of removable cylindrical screen-sections with a skeleton frame comprising end pieces and 100 longitudinal connecting-ribs, one of the end pieces being of collar form, while the other is a perforated cup, part of the ribs being removable, substantially as and for the purpose described. 105

2. The combination, with the skeleton screen-frame having a collar at one end and a perforated cup at the other, of cylindrical screen-sections having different gage of perforations, a hinged adjustable frame, friction-rollers, a 110 short journal, gear-wheels, a pulley-shaft, and a supporting-frame having bins and chutes which receive the materials discharged through the screen-sections and the perforated cup end of the skeleton frame, substantially as and for 115 the purpose described.

3. The combination, with the supporting-frame provided with a friction-roller support, bins, and chutes, of the hinged frame provided with driving-gearing, the skeleton screen- 120 frame having a sectional screening-surface, a supporting-collar, a bevel-gear wheel, and a short journal, substantially as and for the purpose described.

PHILETUS W. GATES.

Witnesses:

ROBT. L. FENWICK,
 B. C. FENWICK.