No. 694,565. Patented Mar. 4, 1902.

V. W. MASON, Jr.

REVOLVING SCREEN.

(Application filed Oct. 25, 1899.)

(No Model.) 2 Sheets—Sheet 1.

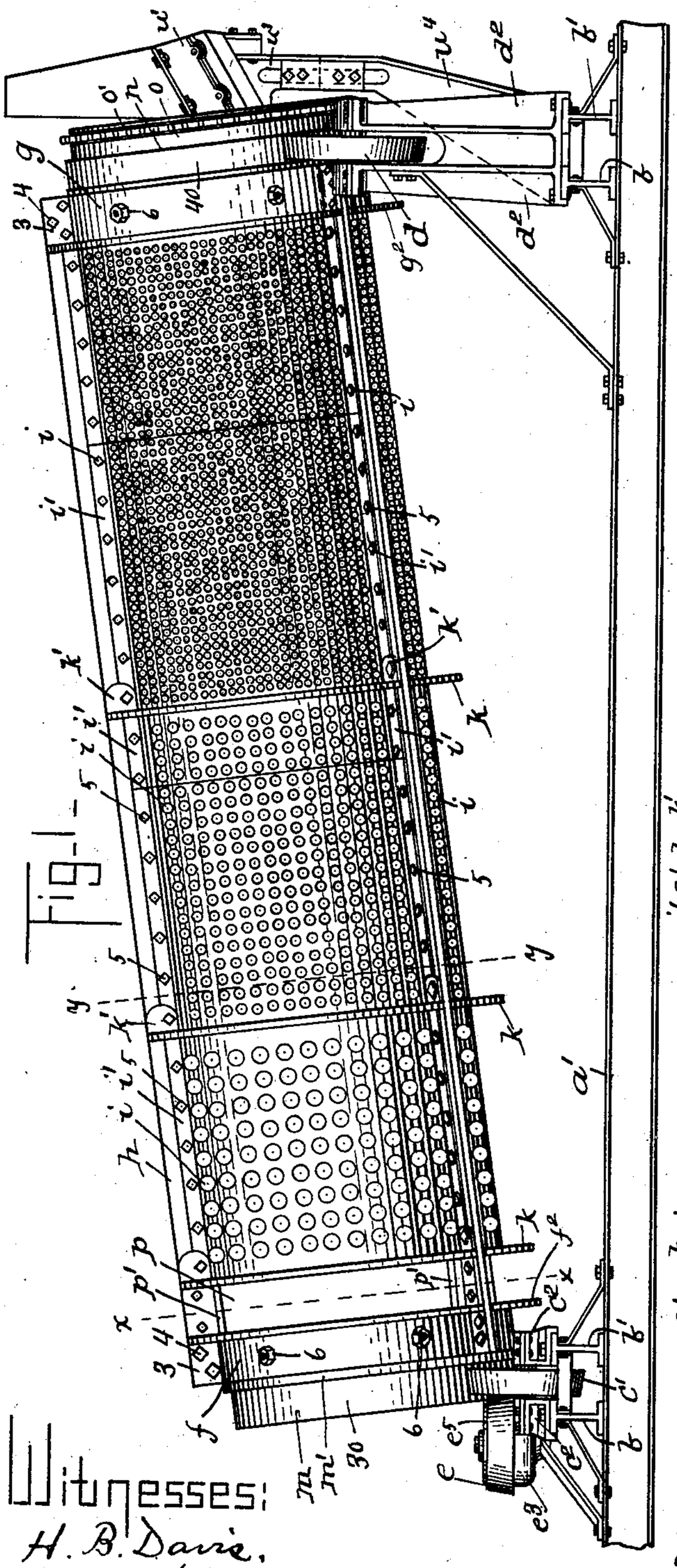

Fig. 1.

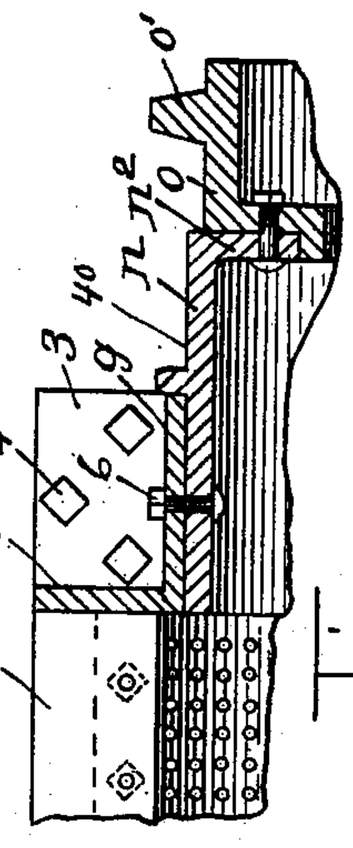

Fig. 4.

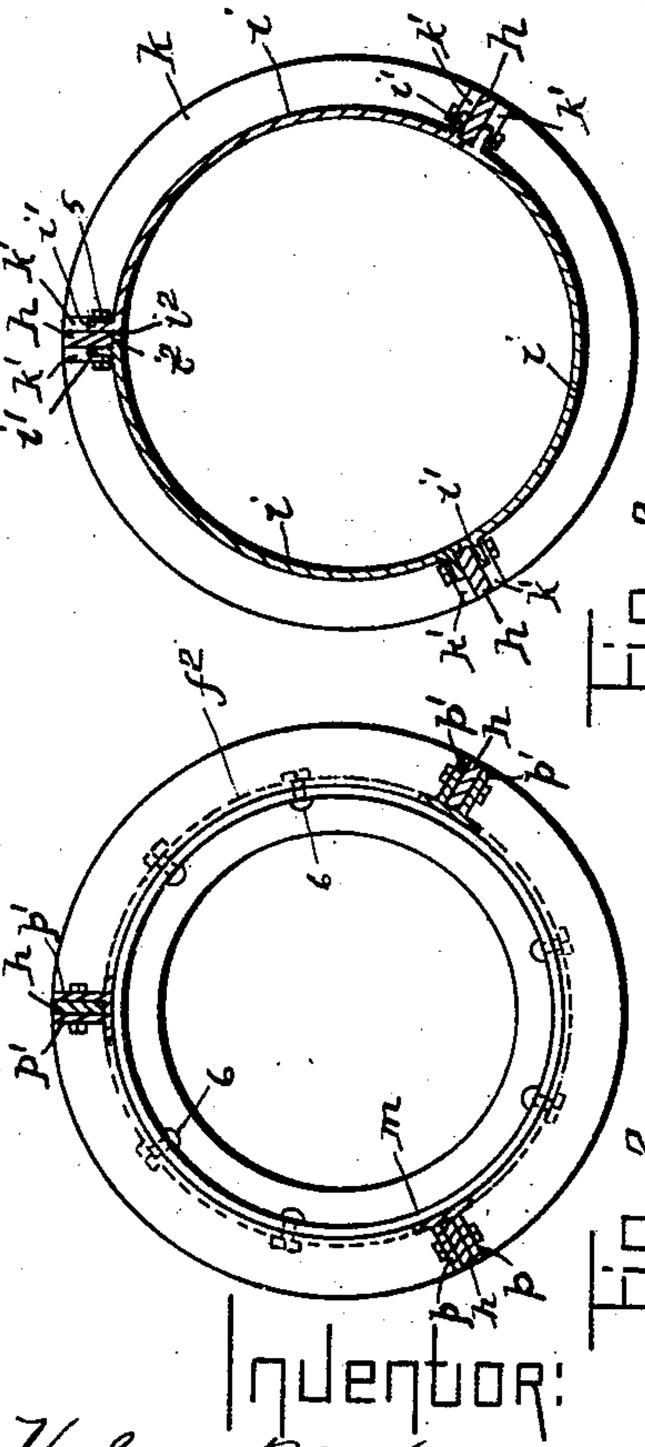

Fig. 3.

Fig. 2.

Witnesses:
H. B. Davis,
J. L. Hutchinson.

Inventor:
Volney W. Mason Jr.
by F. J. Lawton
Atty

No. 694,565. Patented Mar. 4, 1902.

V. W. MASON, JR.

REVOLVING SCREEN.

(Application filed Oct. 25, 1899.)

(No Model.) 2 Sheets—Sheet 2.

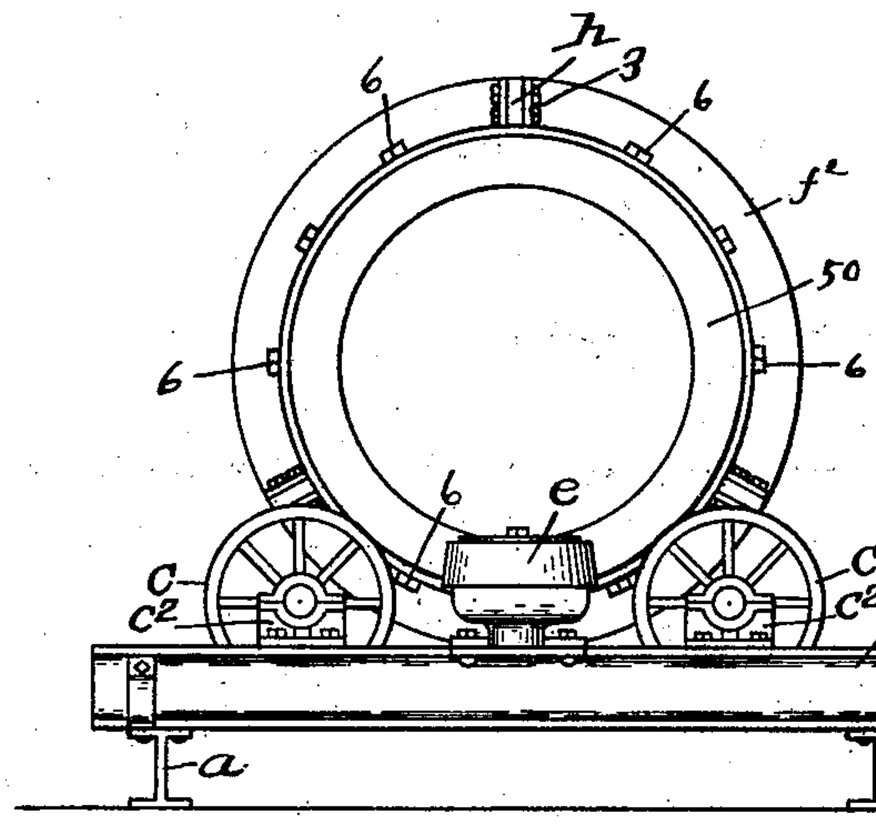

Fig. 6.

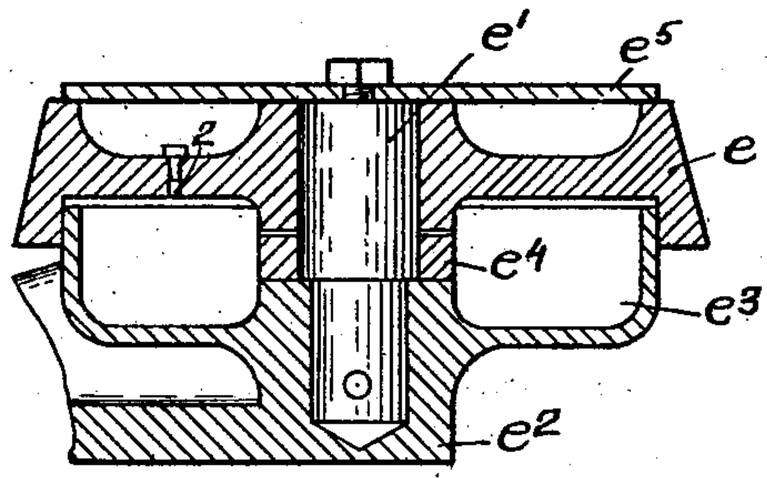

Fig. 8.

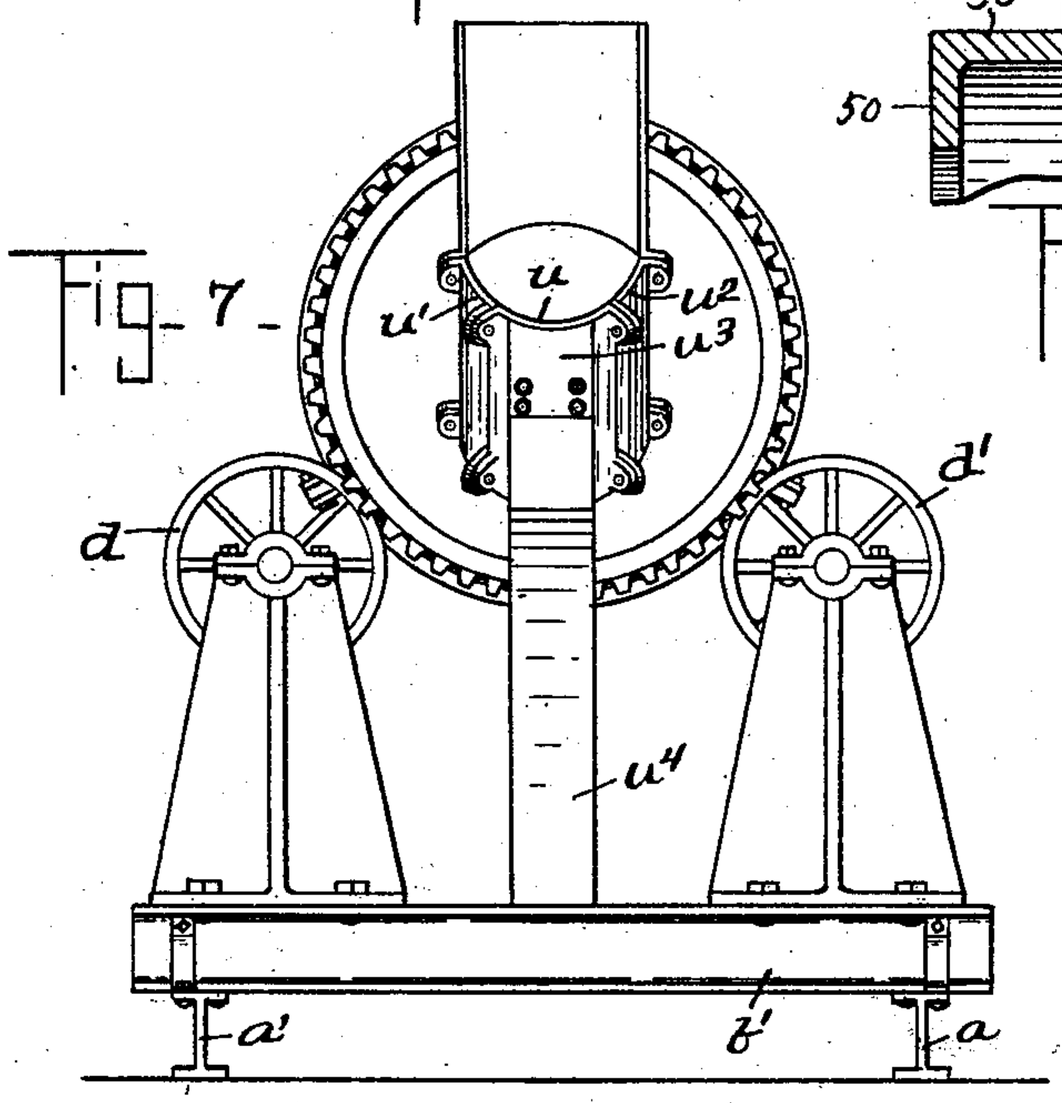

Fig. 7.

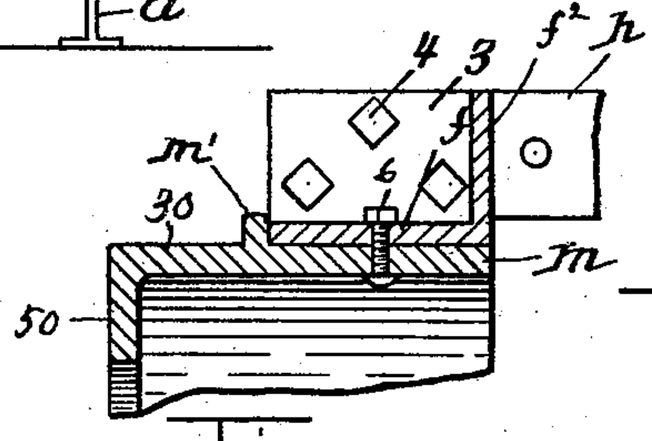

Fig. 5.

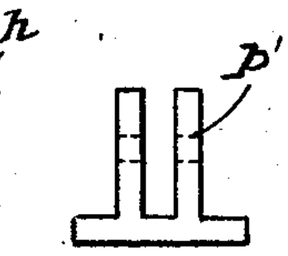

Fig. 10.

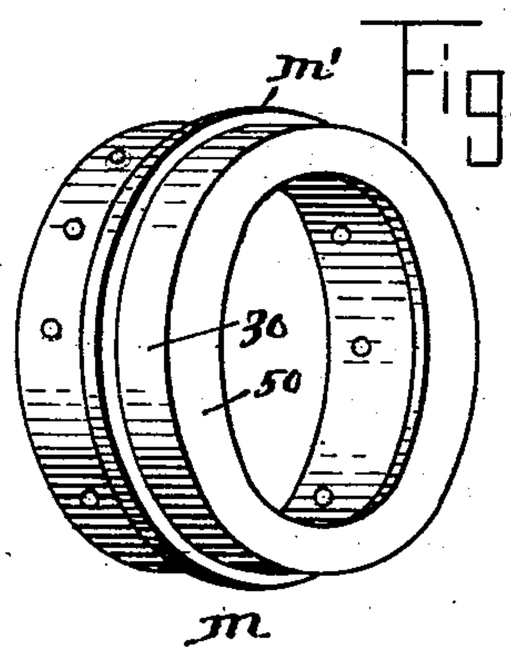

Fig. 9.

Witnesses:
H. B. Davis.
Jennie L. Hutchinson

Inventor:
Volney W. Mason Jr.
by B. J. Noyes
Atty

UNITED STATES PATENT OFFICE.

VOLNEY W. MASON, JR., OF NEW YORK, N. Y., ASSIGNOR TO TAYLOR IRON AND STEEL CO., OF HIGHBRIDGE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

REVOLVING SCREEN.

SPECIFICATION forming part of Letters Patent No. 694,565, dated March 4, 1902.

Application filed October 25, 1899. Serial No. 734,757. (No model.)

To all whom it may concern:

Be it known that I, VOLNEY W. MASON, Jr., of New York, county of New York, and State of New York, have invented an Improvement in Revolving Screens, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to revolving screens especially adapted for heavy work—such, for instance, as screening stone; and it has for its object to provide improved means for resisting the end thrust of the inclined revoluble cylinder, which is independent of the driving mechanism, and in addition to relieving the driving mechanism of the strain very materially reduces the power required to revolve the cylinder and also reduces the wear of the parts; also, to provide an improved form of roller-bearing support for the revoluble cylinder; also, to so construct the apparatus that the parts subjected to the greatest wear are readily removable in order that they may be replaced by new parts whenever desired; also, to provide sectional screen-plates of novel construction which may be removed whenever desired; also, to provide the revolving cylinder with an improved form of ring having sprocket-teeth whereby the cylinder may be driven by means of a sprocket-chain; also, to provide an improved form of conducting-chute for delivering the stone to the screen; also, to improve and simplify the construction of the apparatus in many other particulars, as will be hereinafter set forth.

Figure 1 shows in side elevation a revolving screen embodying my invention. Fig. 2 is a cross-section of the revoluble cylinder, taken on the dotted line $x\ x$, Fig. 1, looking toward the left. Fig. 3 is a cross-section of the revoluble cylinder, taken on the dotted line $y\ y$, Fig. 1. Fig. 4 is a longitudinal section of a portion of the upper end of the cylinder. Fig. 5 is a similar longitudinal vertical section of a portion of the lower end of the cylinder. Fig. 6 is a view showing the lower end of the revoluble cylinder. Fig. 7 is a view showing the upper end of the revoluble cylinder. Fig. 8 is a vertical section of the antifriction-roll which is adapted to receive the end thrust of the inclined revoluble cylinder. Fig. 9 is a detail showing one of the end rings of the frame of the cylinder, and Fig. 10 is a detail showing the guard on the longitudinal bar of the frame.

The base of the machine, as herein shown, consists of a pair of parallel channel-iron bars $a\ a'$, set lengthwise the machine, and two pairs of similar channel-iron bars $b\ b'$, placed on said bars $a\ a'$ and secured thereto, there being one pair of such bars $b\ b$ near each end of the bars $a\ a'$. A pair of antifriction-rolls $c\ c'$ are provided for supporting the lower end of the inclined revoluble cylinder, and a similar pair of antifriction-rolls $d\ d'$ are provided for supporting the upper end of said cylinder. A pair of antifriction-rolls $c\ c'$ are secured to or mounted upon horizontal shafts supported in bearings provided for them in brackets or stands c^2, erected upon the bars $b\ b'$, and said antifriction-rolls are made frusto-conical, as shown, to adapt them to contact with a roller-receiving surface 30, which is provided on the outer side of a ring secured to the lower end of the inclined cylinder. The pair of antifriction-rolls $d\ d'$ are secured to or mounted upon horizontal shafts supported in bearings provided for them in brackets or stands d^2, erected upon the bars $b\ b'$ at the opposite end of the cylinder, and said antifriction-rolls are likewise made frusto-conical, as shown, to adapt them to contact with a roller-receiving surface 40, which is provided on the outer side of a ring secured to the upper end of the inclined cylinder. The angle given to the conical faces of the antifriction-rolls $c\ c'$ and $d\ d'$ is the same as the angle of inclination of the revoluble cylinder, and antifriction-rolls of such form have a greater peripheral speed on one side than the other and being disposed, as herein drawn, relative to the inclined cylinder have a tendency to work the cylinder upward as they revolve, and thereby assist in reducing the downward thrust of the inclined cylinder. At the lower end of the cylinder an antifriction-roll e is provided, which is adapted to turn on a vertical axis in alinement with the perpendicular radius of the cylinder, and said roll is made frusto-conical and is adapted to contact with or engage a roller-receiv-

ing surface 50, provided on a ring secured to the lower end of the cylinder. The angle of the conical surface of the roll *e* is at right angles to the angle of inclination of the cylinder. The antifriction-roll *e* (see Figs. 1 and 8) is mounted to revolve freely on a stud *e'*, rising vertically from and supported by a bracket or frame e^2, which is bolted or otherwise secured to the bars *b b'*, and said bracket or frame e^2 is formed with an oil receptacle or reservoir e^3 beneath the antifriction-roll *e*, down into which the hub e^4 of said roll projects, said hub having perforations e^{20} through it, whereby the oil contained in said receptacle e^3 has free access to the bearing *e'* of said roll. The roll *e* is recessed on its under side to allow the oil-reservoir e^3 to project up into it, and said reservoir e^3 lightly contacts with said roll *e*. The roll *e* has a hole 2 through it communicating with said oil-receptacle, whereby the oil may be introduced into said receptacle whenever desired, or any other means may be provided whereby the oil may be introduced. A dust-excluding cap or plate e^5 is secured to the upper end of said stud *e'*, which is made large enough to practically cover the roll *e*, and it is disposed above said roll, so as to lightly contact therewith, and whenever it is desired to introduce oil into the oil-receptacle said plate will be removed. The parts will of course be fitted as closely as practicable for the exclusion of the dust.

The inclined revoluble cylinder consists, essentially, of a frame having sectional screen-plates secured to it and having end rings formed or provided with roller-receiving surfaces for the antifriction-rolls. The frame of the cylinder, as herein shown, consists, essentially, of two end rings *f g*, made substantially alike, and several longitudinal bars *h*, connected at their ends to said end rings *f g*, three such bars being herein shown. Each end ring *f* and *g* is herein shown as formed or provided on its outer side with a number of pairs of outwardly-projecting ears 3, each ring being herein shown as having three pairs of ears, and said rings also have a circumferential flange f^2 g^2, formed with slots opposite the spaces between the ears of each pair, and the longitudinal bars *h*, which connect said end rings *f* and *g* together, are made as long as desired, and the ends of said bars *h* are placed in the slots in the flanges f^2 g^2 and in the spaces or recesses formed or provided between the ears 3 on the rings, being secured to said ears 3 by bolts 4. Screen-plates *i* are secured to said longitudinal bars *h* to present a number of perforated divisions, three such divisions being herein shown, although a greater or less number may be provided, as desired. Each perforated division comprises a number of screen-plates *i*, which are secured to the bars *h*, and as three bars are herein shown each perforated division will comprise three screen-plates, and as said screen-plates each form but a section only of one of the perforated divisions they are herein termed "sectional screen-plates." Each screen-plate *i* has formed along each side or edge an outwardly-projecting flange *i'*, which is adapted to abut against the longitudinal bar *h* and to be secured to said bar by bolts 5 passing through the flanges and through the bars. Thus any one of the screen-plates *i* may be removed whenever desired. The screen-plates *i* also have flanges along their opposite sides or edges, as shown at i^2, which are adapted to pass beneath the bars *h*, and the flanges i^2 of two adjacent screen-plates will abut together, as shown in Fig. 3, and thereby present a smooth surface on the interior of the cylinder, which effectually prevents the edges of the screen-plates from wear and also protects the bars *h*. The screen-plates of each division will vary in size, as usual in screens of this kind, and the perforations of said screen-plates will also vary in size. At the upper end of the cylinder the screen-plates terminate adjacent to or may abut against the end ring *g*, and the screen-plates of each perforated division may abut against the screen-plates of the next division; but at the lower end of the cylinder the screen-plates of the endmost division terminate a short distance above or at one side of the end ring *f* to leave an opening *p* for the tailings. Thus it will be seen that the end ring *f* is supported a short distance beyond the end of the lowermost perforated division. Between each perforated division a circular guard *k* is provided, which is located outside of the cylinder opposite the abutting ends of the screen-plates and which projects outwardly for a short distance—as, for instance, to the outer edges of the bars *h*—and said guards *k* assist in preventing the stone falling from one perforated division into the bin of the next division. These circular guards *k* are made in sections, and, as herein shown, each guard is composed of three sections, and each section has formed upon it at each end a foot *k'*, which abuts against the longitudinal bar *h*, and bolts pass through the feet *k'* and the bars *h* to thereby rigidly secure said sections in position. The circular guards being thus rigidly secured to the longitudinal bars *h* serve to stiffen said bars, and in this respect they form a coöperative part of the frame which supports the perforated cylinder. It will be understood, however, that said guards *k* will subserve this purpose regardless of the particular points along the bars that they may be attached.

At the lower end of the inclined revoluble cylinder a ring *m* is fitted into the end ring *f* and is secured to said end ring *f* by bolts 6 or otherwise, and said ring *m* has formed on its outer side a roller-receiving surface 30, and it has formed on its end a roller-receiving surface 50. The ring *m* has also formed on it an outwardly-projecting flange *m'*, which abuts against the end ring *f*, although such flange may be omitted, if desired. The roller-

receiving surface 30 is so disposed as to cooperate with the antifriction-rolls *c c'*, and said rolls while in engagement therewith support the lower end of the inclined cylinder, and the roller-receiving surface 50 on the end of the ring *m* bears upon the antifriction-roll *e*, and said roll while in engagement therewith receives, and consequently resists, the end thrust of the inclined cylinder and relieves the rolls *c c'* and also the driving mechanism from said end thrust, thereby reducing the friction to the minimum. At the upper end of the cylinder a similar ring *n* is fitted into the end ring *g* and secured thereto by bolts or otherwise, and said ring *n* has formed on its outer side a roller-receiving surface 40, which coöperates with the antifriction-rolls *d d'*, and said ring *n* has also an inwardly-projecting flange n^2, to which a ring *o* is secured, said ring *o* having formed or provided on it a series of sprocket-teeth *o'*, adapted to receive a sprocket-chain, (not shown,) by means of which the cylinder is revolved. It will be seen that the ring *o* is readily detachable from the ring *n* and also that said ring *n* is readily detachable from the end ring *g*, and, furthermore, it will be seen that the ring *m* at the opposite end of the cylinder is also readily detachable from the end ring *f*. The longitudinal bars *h* necessarily cross the opening *p*, and as the cylinder revolves the tailings which drop through said opening have a tendency to wear away said bars *h*, and hence I have provided guards *p'*, which are adapted to be placed upon said bars *h* at said opening to prevent such wear. These guards *p'*, as herein shown, each consist of a flat plate having earson it which astride the bar *h*, and said guards *p'* are secured to said bars by bolts which pass through the ears and through the bars.

At the upper end of the inclined cylinder a conducting-chute is provided for conducting the stone to the cylinder, and said chute consists, essentially, of a bottom plate *u*, having side flanges or ears and two side plates *u' u²*, also having side flanges or ears, and bolts uniting the side flanges or ears to thereby detachably secure the side plate to the bottom plate and form a chute the bottom and both sides of which are separable, and said bottom plate *u* is secured to the upper end of a bracket u^3, which is adjustably secured to a stand u^4, mounted on the base of the apparatus.

I claim—

1. In a revolving screen, an inclined revoluble screen-cylinder having means for supporting its lowermost end, consisting of a pair of cylinder-supporting rolls engaging the side of the cylinder, and an end-thrust roll engaging the end of the cylinder, disposed substantially midway between said cylinder-supporting rolls and revoluble on an axis substantially in alinement with the perpendicular radius of said cylinder, substantially as described.

2. In a revolving screen, an inclined revoluble screen-cylinder having means for supporting its lowermost end consisting of a pair of frusto-conical cylinder-supporting rolls engaging the side of the cylinder, the angle of the conical engaging face of each roll being the same as the angle of inclination of the cylinder, and an end-thrust roll engaging the end of the cylinder, disposed substantially midway between said cylinder-supporting rolls and revoluble on an axis substantially in alinement with the perpendicular radius of said cylinder, the angle of the conical face of said roll being at right angles to the angle of inclination of the cylinder, substantially as described.

3. In a revolving screen, an inclined revoluble screen-cylinder having means for supporting its uppermost end, consisting of a pair of frusto-conical cylinder-supporting rolls engaging the side of the cylinder, the angle of the conical face of each roll being the same as the angle of inclination of the cylinder, and means for supporting its lowermost end, consisting of a pair of frusto-conical cylinder-supporting rolls engaging the side of the cylinder, the angle of the conical engaging face of each roll being the same as the angle of inclination of the cylinder, and a frusto-conical end-thrust roll engaging the end of the cylinder, disposed substantially midway between said cylinder-supporting rolls and revoluble on an axis substantially in alinement with the perpendicular radius of said cylinder, the angle of the conical face of said roll being at right angles to the angle of inclination of the cylinder, substantially as described.

4. In a revolving screen, an inclined revoluble cylinder, a roll at its lower end adapted to receive the end thrust of said cylinder, a recess formed in the under side of said roll, a stud on which said roll is mounted, and a supporting frame or bracket provided with an oil-receptacle, the outer side wall of said receptacle projecting up into the recess in said roll, and the hub of said roll projecting down into said receptacle, substantially as described.

5. In a revolving screen, an inclined revoluble cylinder, a roll at its lower end adapted to receive the end thrust of said cylinder, a recess formed in the under side of said roll, a stud on which said roll is mounted, and a supporting frame or bracket having an oil-receptacle, the outer side wall of said receptacle projecting up into the recess in said roll, and the hub of the roll projecting down into said receptacle, said roll also having a hole through it communicating with said oil-receptacle, substantially as described.

6. In a revolving screen, an inclined revoluble cylinder, a roll at its lower end adapted to receive the end thrust of said cylinder, a stud on which said roll is mounted, supported by a frame or bracket having an oil-receptacle, the hub of said roll projecting down into said receptacle, said roll having a hole through it communicating with said oil-receptacle,

and a dust-excluding plate secured to said stud above the roll, substantially as described.

7. In a revolving screen, an inclined revoluble cylinder consisting of a frame comprising end rings *f*, *g* secured together by longitudinal bars *h*, and sectional screen-plates secured to said bars *h*, to present perforated divisions, an end ring *m* fitted into the ring *f* of the frame and secured thereto by bolts and having a circumferential flange *m'* abutting against the end of said ring *f*, and also having a roller-receiving surface 30, and a roller-receiving surface 50, a pair of cylinder-supporting rolls engaging said roller-receiving surface 30, and a roll engaging said roller-receiving surface 50 turning on a vertical axis in alinement with the perpendicular radius of the cylinder, which receives the end thrust of said cylinder, substantially as described.

8. In a revolving screen, an inclined revoluble screen-cylinder having means for supporting one of its ends, consisting of a pair of cylinder-supporting rolls, and a thrust-roll which receives the end thrust of the screen-cylinder disposed substantially midway between said cylinder-supporting rolls and revoluble on an axis substantially in alinement with the perpendicular radius of said cylinder, substantially as described.

9. In a revolving screen, an inclined revoluble cylinder having a frame comprising several longitudinal bars and having near its lower end an opening for the tailings, and guards *p'* which protect said longitudinal bars at said opening, substantially as described.

10. In a revolving screen, an inclined revoluble cylinder and a conducting-chute composed of a bottom piece having side flanges or ears, a support therefor, side pieces having side flanges or ears, and bolts uniting the side flanges or ears to thereby detachably connect the side pieces to the opposite sides of the bottom piece, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

VOLNEY W. MASON, JR.

Witnesses:

B. J. NOYES,

J. L. HUTCHINSON.