

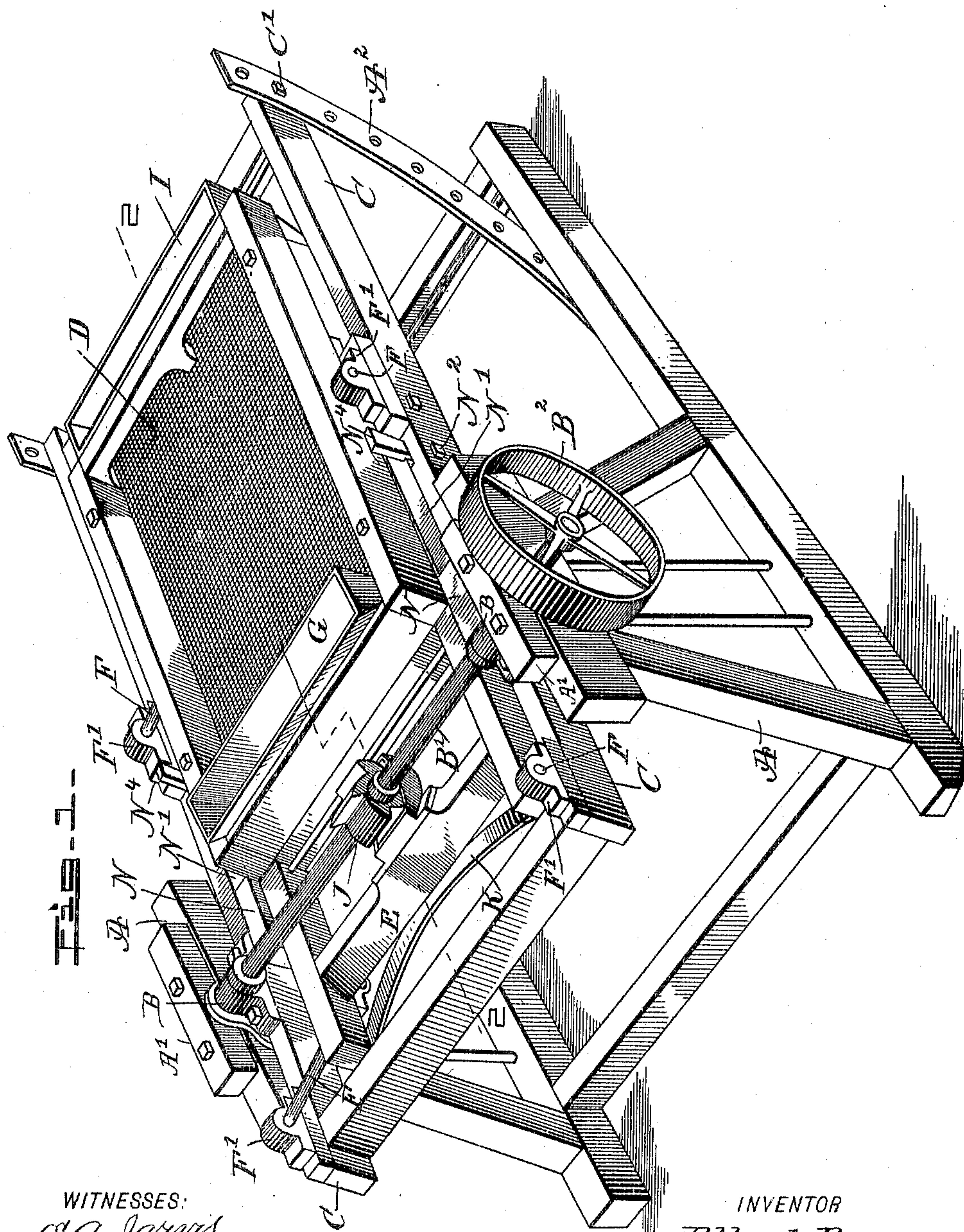
No. 821,430.

PATENTED MAY 22, 1906.

A. PERRY.  
ORE SEPARATOR.

APPLICATION FILED JULY 14, 1904.

2 SHEETS—SHEET 1.



WITNESSES:

C. A. Jarvis.

Geo. H. H. H.

INVENTOR

Albert Perry

BY

Mumford

ATTORNEYS



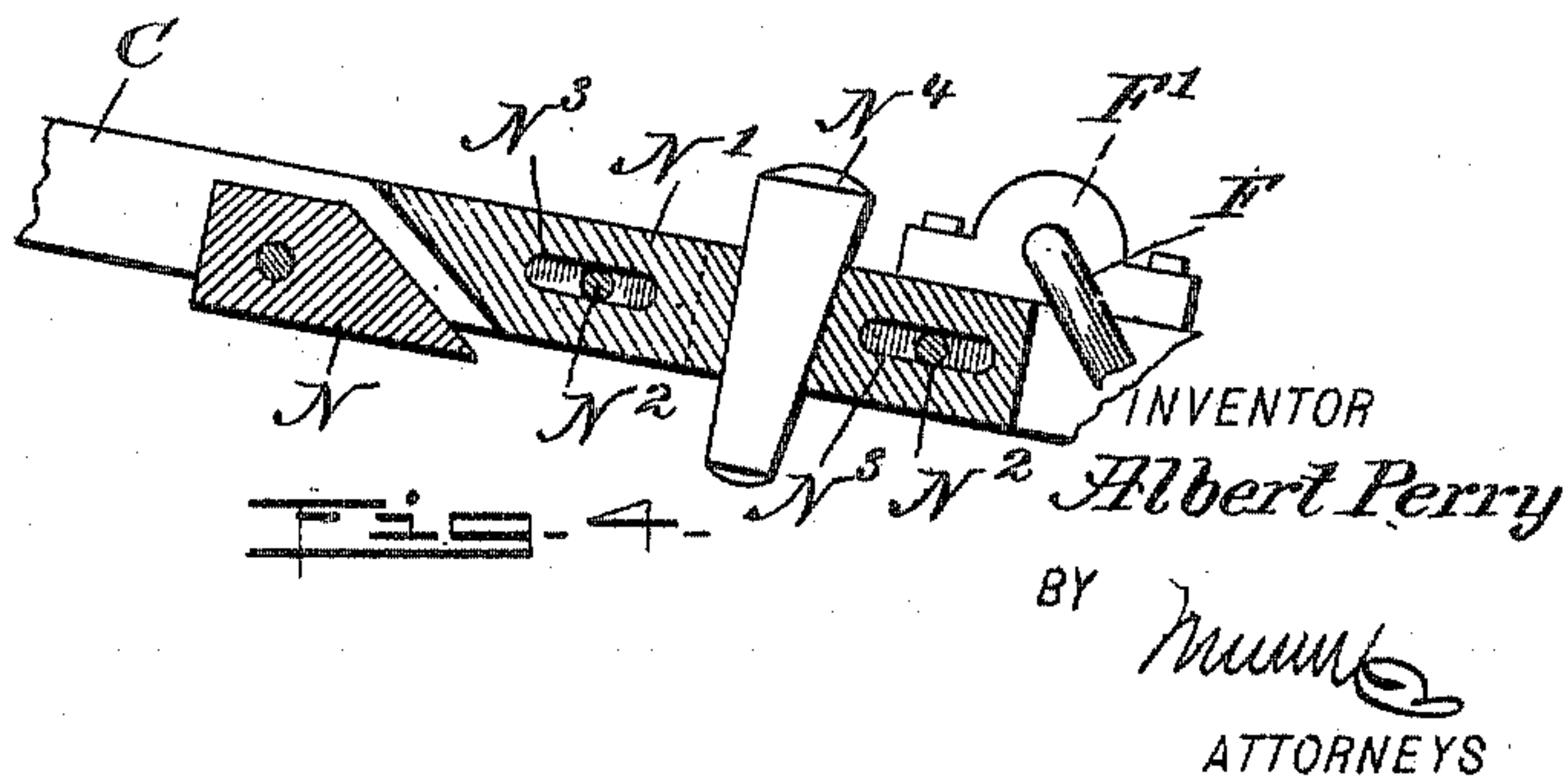
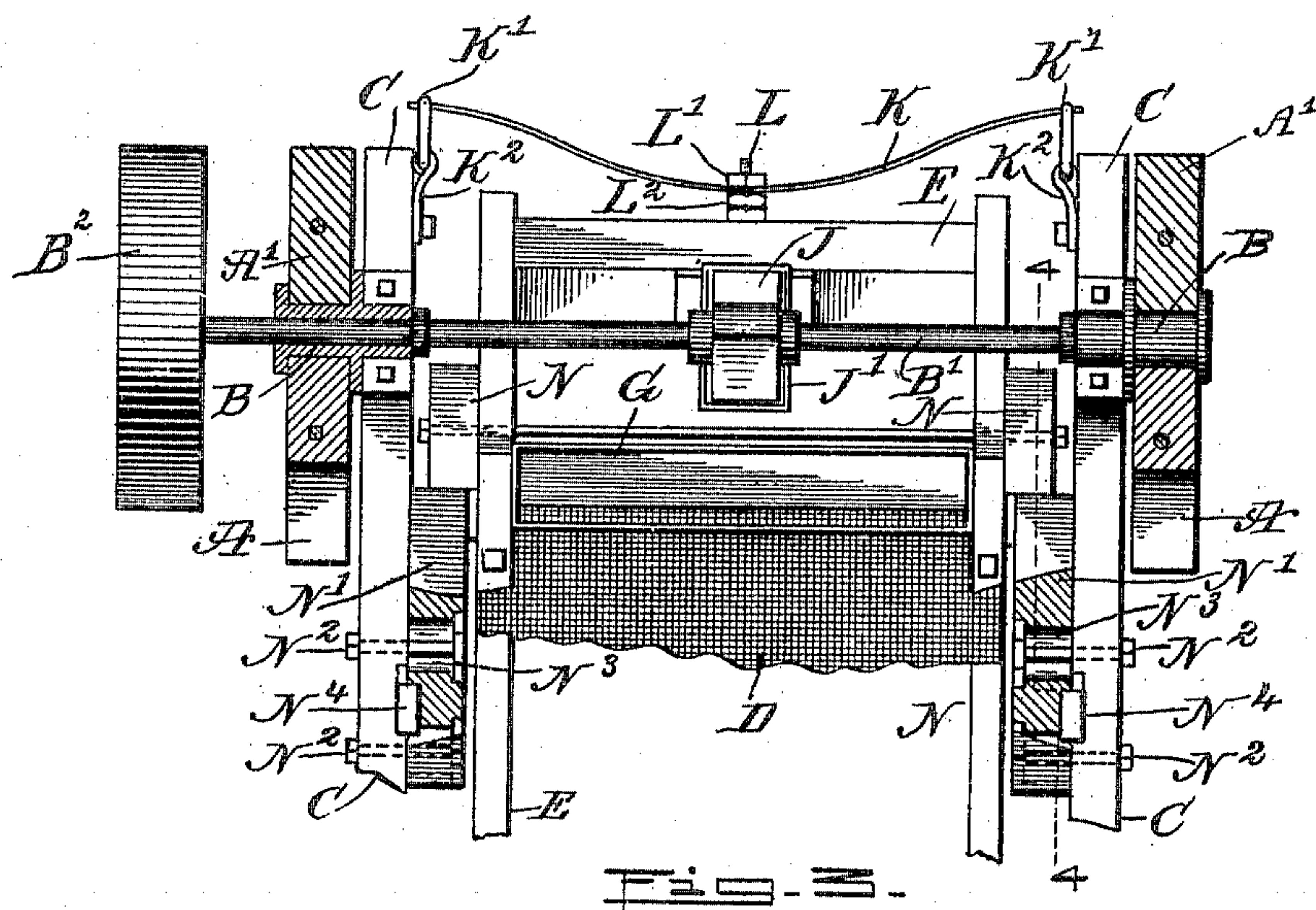
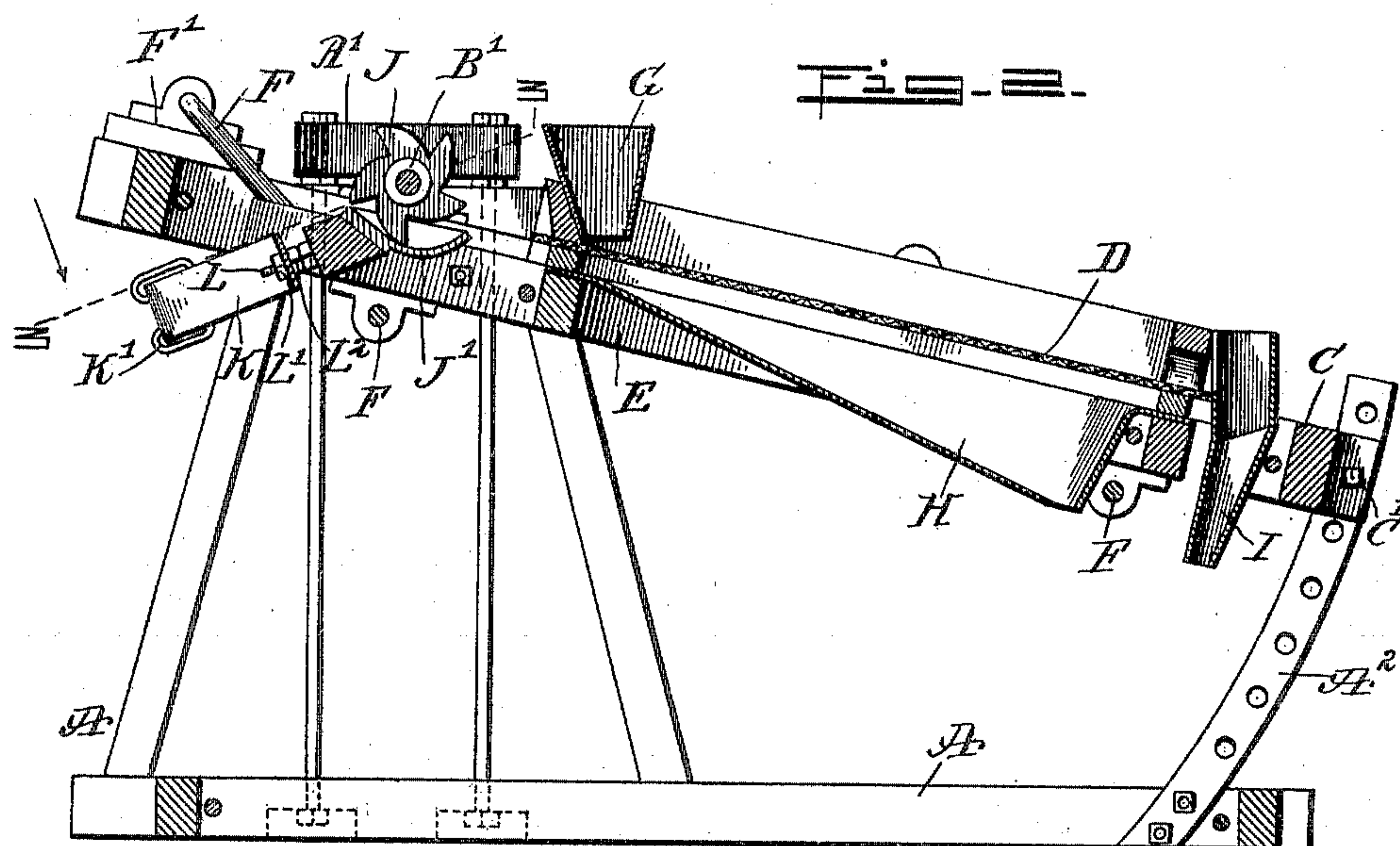
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C. A. Jarvis  
Rev. G. Foster

INVENTOR  
*Albert Perry*  
BY *Mumme*  
ATTORNEYS



# UNITED STATES PATENT OFFICE.

ALBERT PERRY, OF CARIBOU, COLORADO.

## ORE-SEPARATOR.

No. 821,430.

Specification of Letters Patent.

Patented May 22, 1906.

Application filed July 14, 1904. Serial No. 216,505.

*To all whom it may concern:*

Be it known that I, ALBERT PERRY, a citizen of the United States, and a resident of Caribou, in the county of Boulder and State of Colorado, have invented a new and Improved Ore-Separator, of which the following is a full, clear, and exact description.

The invention relates to screening-machines for separating finer materials from coarser materials; and its object is to provide a new and improved separator for treating dry or wet ores to separate the finer materials from the coarser ones in a very quick, simple, and effective manner without danger of the coarser materials clogging the meshes of the screen.

The invention consists of novel features and parts and combinations of the same, as will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a perspective view of the improvement. Fig. 2 is a longitudinal sectional elevation of the same on the line 2 2 of Fig. 1. Fig. 3 is a sectional plan view of part of the same on the line 3 3 of Fig. 2; and Fig. 4 is a sectional side elevation of the bumping-blocks for the screen, the section being on the line 4 4 of Fig. 3.

The standards of a suitable framework A are provided with bearings A', in which are journaled the trunnions B, secured to the main frame C, in which is hung a swing-frame E, supporting a screen D, the said swing-frame being hung on the lower ends of inclined radius-rods F, fulcrumed at their upper ends in suitable bearings F', attached to the top of the main frame C. The lower free end of the main frame C is adjustably fastened by bolts C' to apertured segments A<sup>2</sup>, forming part of the framework A. By the arrangement described more or less inclination can be given to the main frame C, and consequently to the swing-frame E and the screen D, according to the nature of the material to be treated, the inclination of the screen and its supporting swing-frame E being, however, approximately the same as that of the main frame C. The adjustment referred to can be made while the machine is running, as the trunnions B of the main frame C sustain the load.

On the upper end of the screen D is arranged a feed-hopper G for receiving the material to be treated, the lower end of said hopper discharging onto the upper end of the screen, as will be readily understood by reference to Fig. 2. Underneath the screen D and secured to the swing-frame E is arranged a receiving-hopper H for receiving the concentrates or finer materials passing through the meshes of the screen D, and the extreme lower end of the screen D discharges into a hopper I for carrying off the tailings or coarser materials, so that the finer materials and the coarser materials accumulate in separate piles on the floor or other foundation on which the machine is set. The finer materials are subsequently treated on concentrating-tables, while the coarser or oversized material is returned to the pulverizing-machine to be reduced.

The radius-rods F are inclined, as plainly indicated in Fig. 2, to permit the swing-frame E and its screen D to swing downward and forward or upward and rearward, the downward-and-forward swinging motion or downstroke being gradual and accomplished by the use of a revolving cam J operating on a shoe J', secured to the upper end of the swing-frame E. The cam J is secured on a cam-shaft B', journaled in the hollow trunnions B and provided with a pulley B<sup>2</sup>, connected by a belt with other machinery for imparting a rotary motion to the said cam-shaft B' and its cam J. It is understood that the discharge end of the machine is considered the rear end and the portion containing the cam-shaft B' and the feed-hopper G the forward end of the machine. The amount of stroke given by the cam J and shoe J' to the swing-frame E is such that the radius-rods F swing but short distances up and down from their normal inclined position, which is approximately at an angle of forty-five degrees, and hence the swing-frame E swings in the same arc of a circle, so that it is not necessary to incline the frame E and its screen D to a great extent, and hence insure a better and quicker separation of the finer and coarser materials.

The upward-and-rearward swinging motion or upstroke of the swing-frame E and screen D is more sudden and is accomplished by the employment of a spring K, preferably in the form of a leaf-spring, secured at its middle on a bolt L, attached to the shoe J', the spring being engaged at opposite faces by two nuts



L' and L<sup>2</sup>, screwing on the bolt L, to allow of adjusting the tension of the spring K. The free ends of the spring K are pivotally connected with links K', attached to brackets K<sup>2</sup> at the upper end of the main frame C, and when a tooth of the cam J imparts a downward - and - forward swinging motion to the swing-frame E and its screen D then the spring K is put under heavy tension, and as soon as the tooth of the cam leaves the shoe J' then the spring K imparts a quick upward- and - rearward stroke to the swing-frame E and its screen D.

The swing-frame E and the screen D are bumped at the upstroke, and for this purpose bumping-blocks N are secured to the sides of the swing-frame E, and the inclined faces of the bumping-blocks N are adapted to abut against the corresponding faces on bumping-blocks N', adjustably secured to the sides of the main frame C. When the swing-frame E and screen D are forced upward and rearward by the action of the spring K, then the bumping-blocks N move in contact with the bumping-blocks N', so as to give a heavy concussion to the swing-frame E and screen D and the material thereon to cause the material to fly upward and rearward off the screen and then fall back again onto the screen, and as the screen is in an inclined position it is evident that the material falls back onto the screen a distance farther down on the face thereof, so that the material is caused to gradually travel down the inclined screen on successive concussions given to the frame E and screen D. By forcing the material temporarily off the screen it is evident that the coarser material is not liable to clog the meshes of the screen, as the said coarser material is dislodged every time a bump or concussion is had, and hence the meshes of the screen are kept free for the finer material to drop down into the hopper H, while the coarser material finally travels over the end of the screen and drops into the hopper I.

In order to permit adjustment of the bumping-blocks N', bolts N<sup>2</sup> are provided, held in the sides of the main frame C and extending through elongated slots N<sup>3</sup> in the blocks N', as plainly indicated in Fig. 3. The blocks N' are also engaged by wedges N<sup>4</sup>, extending partly in recesses in the sides of the frame C and in recesses in the blocks N', so that when the bolts N<sup>2</sup> are loosened and the wedges are driven down then the blocks N' are pushed upwardly on the sides of the frame C to lengthen or shorten the stroke and to compensate for wear on their inclined faces, as the latter are engaged by the inclined faces of the bumping-blocks N. It is understood that when the blocks N' are adjusted the bolts N<sup>2</sup> are screwed up to securely hold the blocks N' in position on the main frame C.

In operating the machine a continuous rotary motion is given to the cam-shaft B' by a

driven belt passing over the pulley B<sup>2</sup> on the said cam-shaft, so that the cam J imparts downward-swinging motions to the frame E and screen D, while the upstroke of the latter is produced by the spring K, as previously explained, and a concussion is had during the upstroke by the bumping-blocks N abutting against the bumping-blocks N'.

By arranging the screen D in an inclined position, swinging it in the manner described, and causing a concussion during the upstroke it is evident that the material fed by the hopper G onto the upper end of the screen D is agitated to cause the material to gradually move down on the screen—for the finer particles to pass through the meshes of the screen into the hopper H, and for the coarser material to finally pass into the hopper I. As the concussion takes place on the upstroke the materials all over the screen are dislodged for the time being—that is, moved upward away from the screen's upper face to keep the meshes of the screen clear for the finer material to drop down into the hopper H to insure a perfect separation of the finer materials from the coarser ones.

The machine is very simple and durable in construction and easily operated without requiring much power or attention on the part of the operator.

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

1. A separator, comprising a supporting-frame, an inclined screen hung on inclined radius-rods in the frame, a leaf-spring secured at its center to the screen and having its ends pivotally connected with the frame for imparting an upward - and - rearward swinging motion to the screen, means for imparting a gradual downward - and - forward swinging motion to the screen, and a bumping device at the forward end of the screen for bumping the same on the upstroke.

2. A separator comprising a main frame, inclined radius-rods fulcrumed on the said main frame, an inclined swing-frame hung on the said radius-rods, a screen supported on the said swing-frame, a leaf-spring secured at its middle on the upper end of said swing-frame, links pivotally supported from the said main frame and pivotally connected with the free ends of the said spring, a shoe on the upper end of the said swing-frame, a revoluble cam engaging the said shoe for imparting a downward-and-forward swinging motion to the said swing-frame and its screen, and bumping-blocks on the sides of the main frame, adapted to be engaged by blocks on the sides of the front end of the swing-frame on the upstroke of the latter.

3. A separator comprising a main frame, inclined radius-rods fulcrumed on the said main frame, an inclined swing-frame hung on the said radius-rods, a screen supported on



the said swing-frame, a leaf-spring secured at its middle on the upper end of the said swing-frame, links pivotally supported from the said main frame and pivotally connected with the free ends of the said spring, a shoe on the upper end of the said swing-frame, a revoluble cam engaging the said shoe for imparting a downward-and-forward swinging motion to the said swing-frame and its screen, bumping-blocks on the sides of the main frame, adapted to be engaged by blocks on the sides of the front end of the swing-frame on the upstroke of the latter, said blocks having beveled ends and means for varying the inclination of the said main frame.

4. A separator comprising a main frame, inclined radius-rods fulcrumed on the said main frame, an inclined swing-frame hung on the said radius-rods, a screen supported on the said swing-frame, a leaf-spring secured at its middle on the upper end of the said swing-frame, links pivotally supported from the said main frame and pivotally connected with the free ends of the said spring, a shoe on the upper end of the said swing-frame, a revoluble cam engaging the said shoe for imparting a downward-and-forward swinging motion to the said swing-frame and its screen, bumping-blocks on the sides of the main frame, adapted to be engaged by blocks on the sides of the front end of the swing-frame on the upstroke of the latter, a feed-hopper secured to the upper end of the screen, a concentrate-receiving hopper attached to and arranged under the screen, and a tailings-hopper at the lower end of the screen.

5. A separator comprising a main frame, inclined radius-rods fulcrumed on the said main frame, an inclined swing-frame hung on the said radius-rods, a screen supported on the said swing-frame, a leaf-spring secured at its middle on the upper end of the said swing-

frame, links pivotally supported from the said main frame and pivotally connected with the free ends of the said spring, a shoe on the upper end of the said swing-frame, a revoluble cam engaging the said shoe for imparting a downward-and-forward swinging motion to the said swing-frame and its screen, bumping-blocks on the sides of the main frame, adapted to be engaged by blocks on the sides of the front end of the swing-frame on the upstroke of the latter, and means for varying the tension of the said spring.

6. A separator comprising a framework, a main frame having trunnions journaled in the said framework, inclined radius-rods fulcrumed on the said main frame, an inclined swing-frame hung on the said radius-rods, a screen supported on the said swing-frame, a leaf-spring secured at its middle on the upper end of the said swing-frame, links pivotally supported from the said main frame and pivotally connected with the free ends of the said spring, a shoe on the upper end of the said swing-frame, a revoluble cam engaging the said shoe for imparting a downward-and-forward swinging motion to the said swing-frame and its screen, the shaft of the cam being journaled in the said trunnions, means for adjustably holding the free end of the said main frame, and bumping-blocks on the sides of the main frame, adapted to be engaged by blocks on the sides of the front end of the swing-frame on the upstroke of the latter, said blocks having beveled ends.

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

ALBERT PERRY.

Witnesses:

M. W. JELINEK,  
DAVID BOALS.