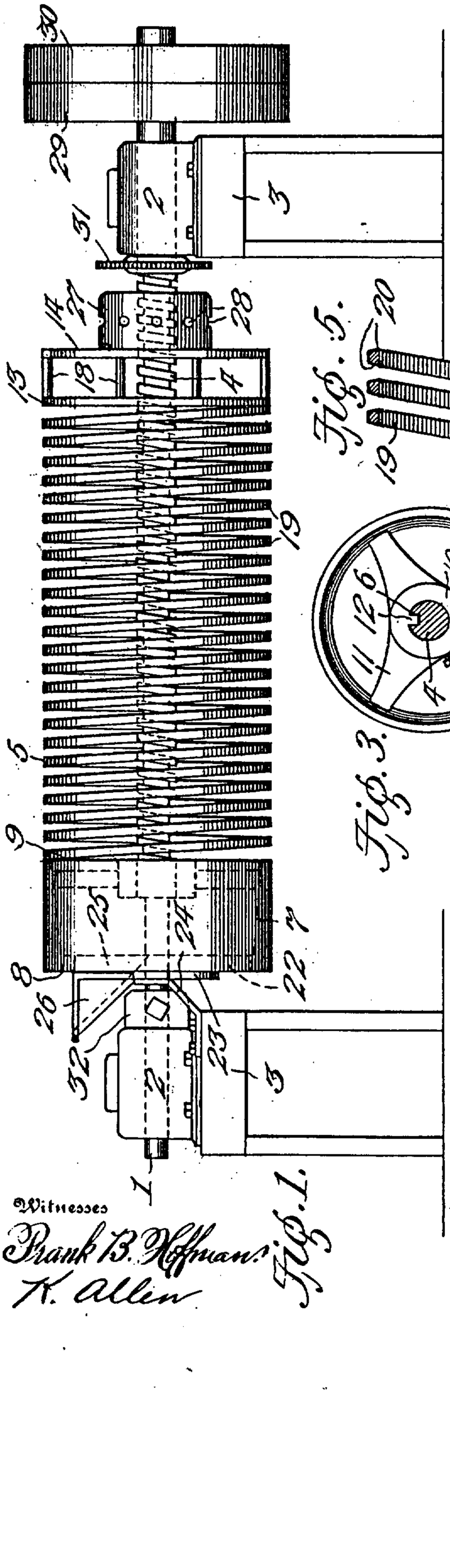
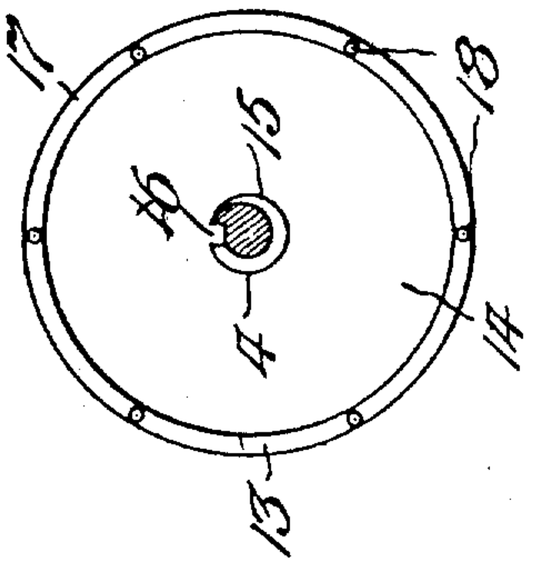
No. 892,825. PATENTED JULY 7, 1908.

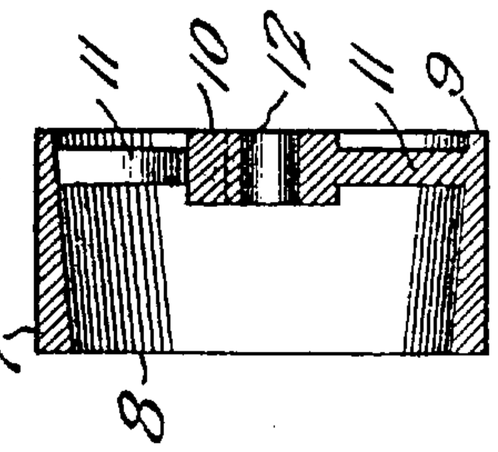
A. S. GOSS.

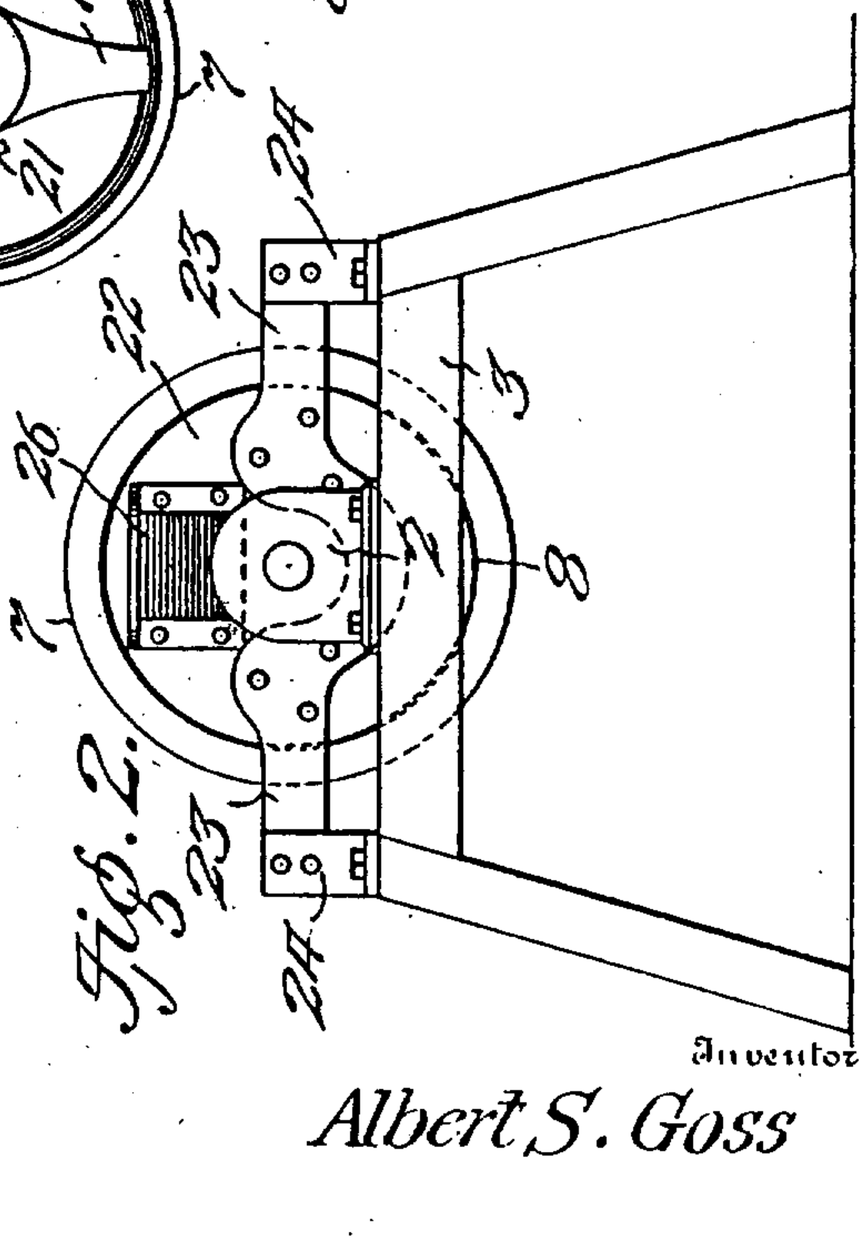
GRADING OR SEPARATING MACHINE.

APPLICATION FILED MAR. 26, 1907.









Witnesses

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GRADING OR SEPARATING MACHINE.

No. 892,825. Specification of Letters Patent. Patented July 7, 1908.

Application filed March 26, 1907. Serial No. 364,697.

To all whom it may concern:

Be it known that I, ALBERT S. GOSS, a citizen of the United States of America, residing at Portland, in the county of Multnomah and State of Oregon, have invented new and useful Improvements in Grading or Separating Machines, of which the following is a specification.

The invention relates to an improvement in separators designed primarily for the grading or separation of any granular material.

The main object of the present invention is the provision of a separator in which the separating element is constructed for convenient adjustment to permit desired variation in separating effect.

The invention will be described in the following specification, reference being had particularly to the accompanying drawings, in which:—

Figure 1 is a view in side elevation of a separator constructed in accordance with my invention. Fig. 2 an end elevation of the same. Fig. 3 an inner end view of the feeding drum. Fig. 4 a central longitudinal section of the same. Fig. 5 a broken longitudinal section through the separating element. Fig. 6 an inner end elevation of the receiving drum.

Referring particularly to the drawings, wherein is shown the preferred embodiment of the present invention, my improved separator comprises a main shaft 1, of any desired length, designed to be supported adjacent its respective ends in boxes 2 mounted upon end frames 3. The particular structure of the frame or of the boxes may vary in accordance with the particular use for which the separator is designed.

The main shaft 1, between the boxes 2, is diametrically enlarged, as at 4, said enlarged portion being formed throughout its length with a thread 5, and with a longitudinally extending key seat 6, the latter preferably extending throughout the threaded portion of the shaft.

Adjacent one of the frames 3 the shaft 1 is arranged to support what I term the feeding drum 7, preferably a cylindrical casing of appropriate length having its interior diameter gradually increased from one end toward the other, so that the inlet end 8 of the drum of less diameter interiorly than the outlet d 9. Adjacent the outlet end of the shell e drum is connected to a hub 10 by radially anged spokes 11, and said hub is interiorly formed with a key 12, arranged to engage the key seat 6 of the main shaft. Adjacent the opposite end of the shaft is arranged a receiving drum 13, comprising a disk 14 centrally formed with an opening 15 to encircle the enlarged or threaded portion of the shaft, the wall of which openings is provided with a key 16 to engage the key seat of the shaft. The drum 13 also includes an annular band or ring 17 connected with the disk 14 through the medium of transversely disposed pins 18, said pins being of a length to space the ring and drum the desired distance apart, as clearly apparent from Fig. 1.

The separating element 19 is arranged to encircle the main shaft between the feeding and receiving drums, said separating element being in the form of a coil spring, the respective terminals of which are secured to the respective drums. The diameter of the coils of the spring separator is approximately equal to that of the respective drums. The spring is preferably formed of angular material, of slightly pyramidal shape in cross section, so that the proximate surfaces of adjacent coils incline from each other toward the relatively outer surfaces of the spring member, as clearly shown at 20 in Fig. 5.

The collar 10 of the feeding drum is provided with a set screw 21 whereby the drum may be secured in fixed relation longitudinally of the shaft, and the head or entrance opening of the drum is closed by a disk 22 slightly less in diameter than the interior diameter of the entrance opening of the drum and secured against movement by a tie strip 23 fixed to the disk and terminally secured beyond the drum to brackets 24 fixed to the adjacent frame 3, as clearly shown in Fig. 2. In the relatively upper portion the disk 22 is formed with a feed spring 25, and to the forward surface of the disk is secured a metallic chute 26 open at the upper end to receive material and having a downwardly inclined bottom to direct the material through the opening 25 in the disk.

An adjusting nut 27 is arranged for threaded connection with the main shaft 1 beyond the receiving drum 13, the connection between the drum and nut being in any desired form so that in the adjustment of the nut, preferably through use of a suitable tool cooperating with an annular series of openings 28 formed in the nut, the receiving drum 13, and thereby the connected end of the spring

may be adjusted to and from the feeding drum. The separator is preferably operated through the usual fast and loose pulleys 29 and 30, mounted upon the main shaft beyond one of the bearings.

In use the material delivered to the feed drum is, by virtue of the inclined surface of said drum, fed into the separating member. As the parts are rotated it is obvious that the material is moved longitudinally of the separating member, due to the spiral formation of the latter, and throughout its movement therethrough is subjected to a separating action in accordance with the space between the proximate coils of said member.

The separating member or spring may be adjusted to increase or decrease the separating effect by proper operation of the nut 27, by which the space between the coils may be obviously increased or decreased. Any desired means, such as a lock nut or the like, may be used for securing the nut 27 in adjusted position. The invention also contemplates a conveyer of any ordinary type for transferring the material separated to place of deposit, and for this purpose a chain gear 31 is preferably fixed on the main shaft adjacent the tail box 2, which additionally serves as a bearing collar for the shaft relative to said box, a second gear or bearing collar 32 being arranged on the main shaft in coöperation with the remaining box.

It is obvious from the construction described that the separator is adapted for the convenient and respective separation of material and is so constructed that it may be instantly regulated to separate various sizes of material without making any additions or variations in the machine structure. Furthermore, by the use of the coil separator the stock will be effectively directed lengthwise the machine, and will be continuously separated during the movement, the material retained by the separating element being directed to and discharged through the receiving drum. Again the machine construction readily adapts it for the usual air currents in separating processes, as the continuous agitation and movement of the stock renders the current of air more effective, while the positive spacing of the spring coil permits the use of a heavier blast, as it is impossible for the material it is desired to retain to be blown between the spring coils.

It is obvious that the relative inclinations of the proximate surfaces of the adjacent coils of the spring may with equal effectiveness be reversed from that position shown in Fig. 5, whereby the base portions will be arranged on the outer surfaces of the spring member. I contemplate this change as within the scope of the present invention.

Having thus described the invention, what is claimed as new, is:—

1. A separator comprising a coiled spring, means for rotating the spring, a feeding drum secured to one end thereof, a head plate for said feeding drum fixed against rotation, a receiving drum secured to the other end thereof, and means for adjusting one of the drums with relation to the other.

2. A separator comprising a main shaft, a feeding drum fixed with relation to the shaft, a head plate for said feeding drum fixed against rotation, a receiving drum movable with relation to the shaft, means for controlling the movement of the receiving drum, and a coiled spring encircling the shaft and terminally secured to the respective drums.

3. A separator comprising a main shaft having a threaded portion, a feeding drum having an inclined inner surface and keyed upon the shaft, a fixed heading disk for said drum, a receiving drum keyed upon the shaft, an adjusting nut having threaded connection with the shaft and adapted to move the receiving drum longitudinally of the shaft, and a coiled separating member encircling the shaft between the drums and terminally connected to the respective drums.

4. A separator comprising a main shaft formed with a threaded portion, a feeding drum keyed upon the shaft, a head plate for said drum encircling the shaft and fixed against rotation, a receiving drum keyed upon the shaft, said drum comprising spaced annular members, and a coiled spring terminally connected to the respective drums and encircling the shaft between them, said spring coil being equal in diameter to the diameter of the respective drums and having its respective convolutions spaced to provide a sifting medium, the sectional contour of each convolution of the spring being such as to increase the space between the adjacent convolutions from the inner surface of the coil toward the outer surface.

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

ALBERT S. GOSS.

Witnesses:
WALTER A. GOSS,
OWEN ANDERSON.