No. 620,416. Patented Feb. 28, 1899.

E. D. CARYL & C. S. SNYDER.

COAL SEPARATOR.

(Application filed Feb. 23, 1898.)

(No Model.) 2 Sheets—Sheet 1.

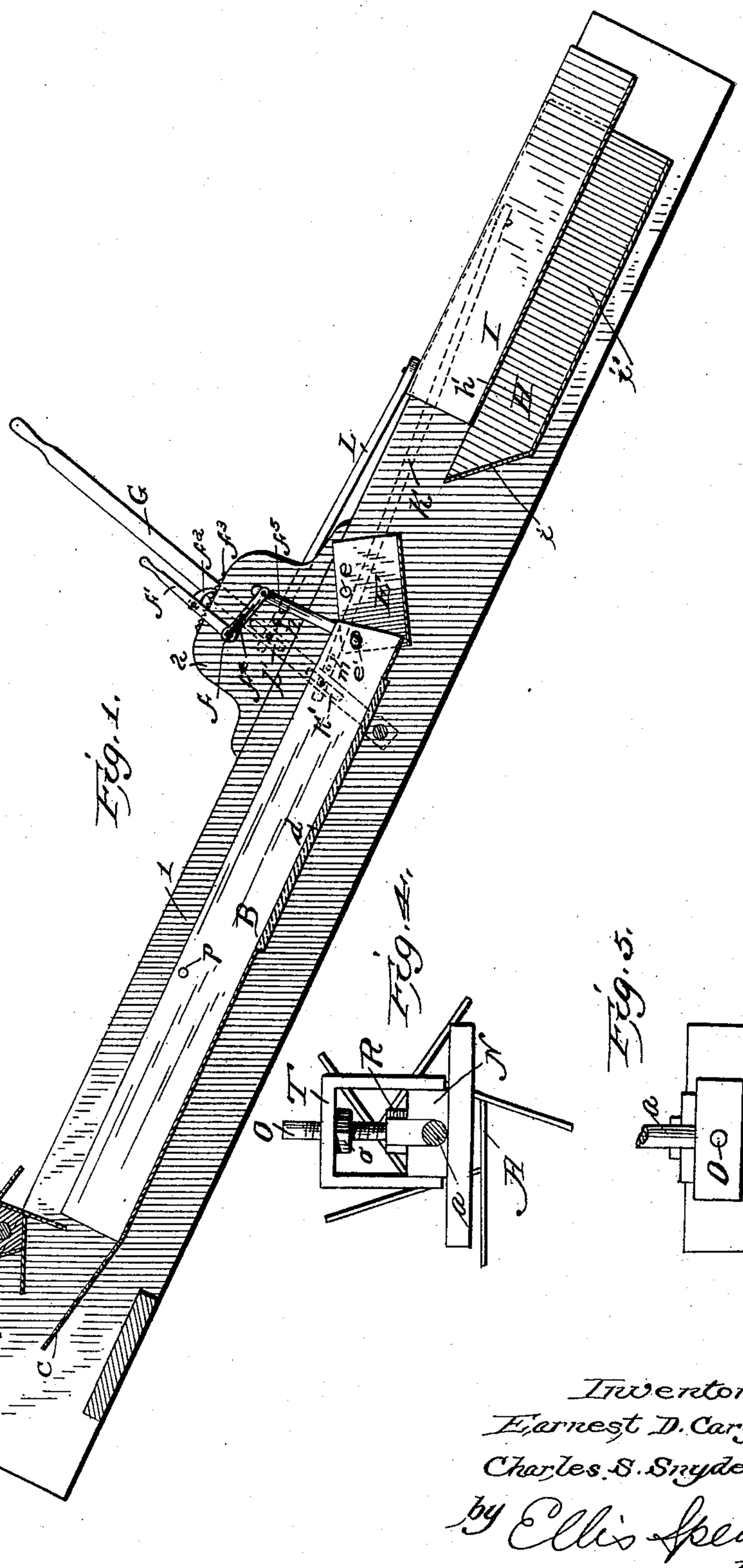

Fig. 1.

Fig. 4.

Fig. 5.

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Fig. 3.

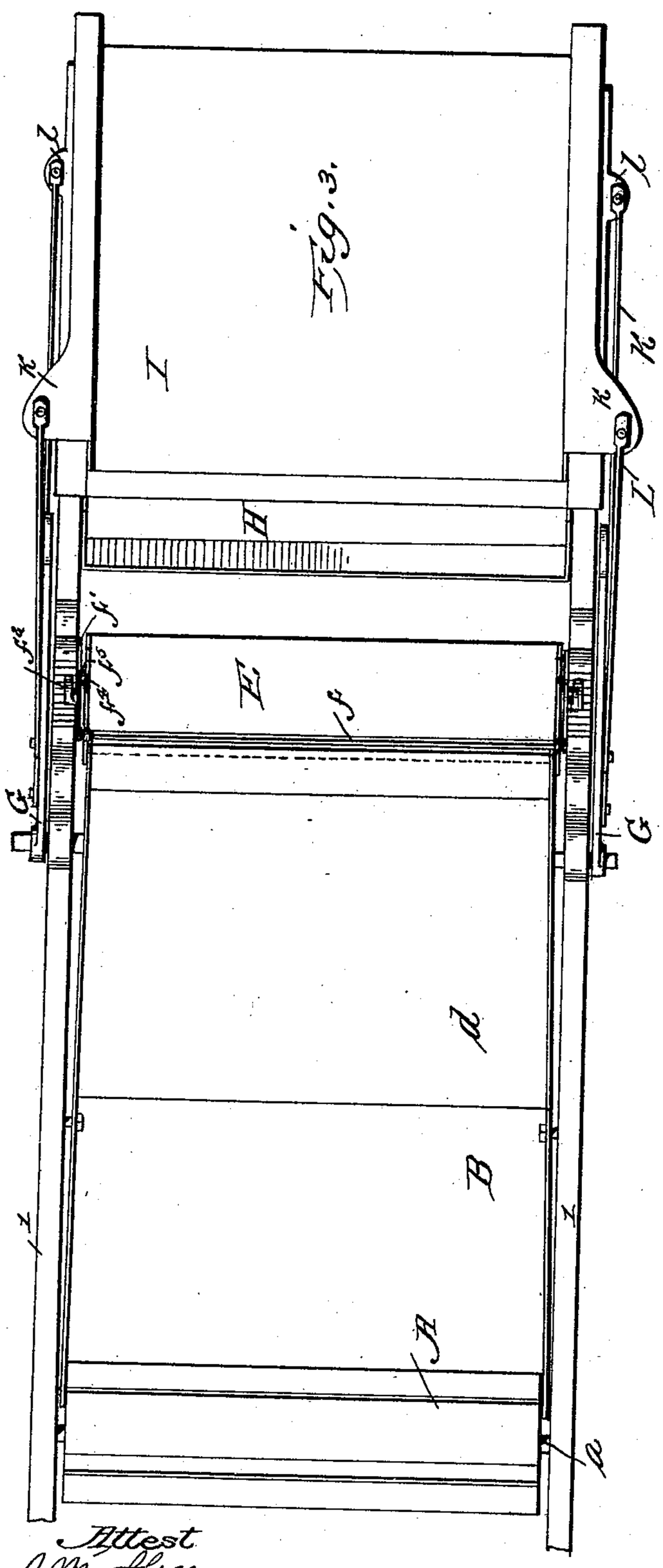
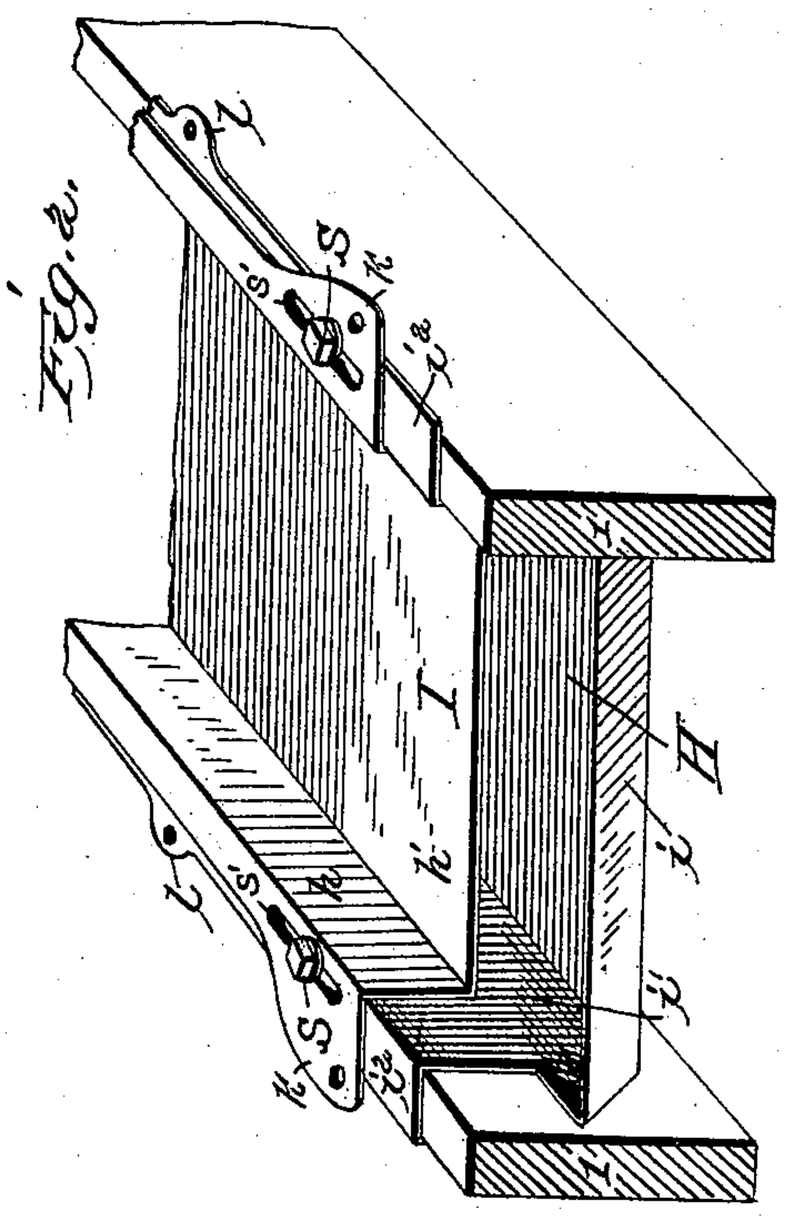


Fig. 2.



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UNITED STATES PATENT OFFICE.

ERNEST D. CARYL AND CHARLES S. SNYDER, OF SCRANTON, PENNSYLVANIA.

COAL-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 620,416, dated February 28, 1899.

Application filed February 23, 1898. Serial No. 671,298. (No model.)

To all whom it may concern:

Be it known that we, ERNEST D. CARYL and CHARLES S. SNYDER, citizens of the United States, residing at Scranton, county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Coal-Separators, of which the following is a specification.

Our said invention relates to improvements in coal-separators of that class in which the coal, with the mingled bone and slate, is caused to slide down an inclined way or chute into a pan or pans located a short distance from the mouth of the chute, so that the coal, by reason of the greater velocity acquired in the descent, is separated from the impurities.

The object of the invention is to simplify the construction and increase the effectiveness of the device; and the invention consists in the construction and arrangement hereinafter pointed out and particularly set forth in the claims.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of the complete separator. Fig. 2 is a detail perspective view of the separating-pans. Fig. 3 is a plan view. Figs. 4 and 5 are detail views of the bearing for the feed-wheel, illustrating the means for regulating or retarding the movement thereof.

Referring by letter to the figures, A designates a feed-wheel having a plurality of wings forming buckets or compartments into which the coal, together with the impurities to be separated, is caused to drop by an incline X, leading from the breaker. (Not shown.) Suitable friction means, to be hereinafter described, are provided whereby the feed-wheel remains stationary until the desired quantity of material has accumulated in the bucket or compartment, when the wheel is rotated by the force of gravity sufficiently to discharge the coal contained therein upon the perforated plate *c* beneath, and also to bring the next bucket or compartment beneath the incline X, the culm dropping through the perforations in the plate. The body of material thus discharged upon the pan travels by gravity down a chute B, pivotally suspended at *p* between the frame members 1, and striking the deflector E at the lower end thereof is thrown upward and outward toward the receiving and separating pans H and I, hereinafter to be described, the slate dropping through the space between the deflector and pans.

In order to regulate the velocity of the material, means are provided for varying the inclination of the chute, as shown in Fig. 1. This consists of a rock-shaft *f*, journaled in bearing-blocks 2, mounted on the frame members 1, and provided with an operating-handle f', carrying a pawl f^2, engaging a rack f^3, for holding the handle or lever f' in any desired position. Arms f^4, extending laterally outward from the shaft, are connected by links f^5 to the lower end of the chute B. The deflector E is pivoted between the frame members 1 at *e*, and its inner end is connected by sliding pivots with the lower end of the chute, preferably by providing slots in the walls of the deflector, through which the pivot-pins e' of the links f^5 pass. By this construction it will be observed that the movement of the operating-handle in one direction or the other will raise or lower the chute B and owing to the fixed pivot *e* of the deflector will cause the said deflector to assume a more or less inclined position, the inclination of the deflector varying inversely with that of the chute.

The chute is preferably provided with a stone bottom *d*, which is used for frictional purposes to retard the velocity of the slate, so that when it leaves the deflector E its momentum is insufficient to carry it to the pan I, causing it to drop directly into the slate-pocket. (Not shown.) The bone being lighter than the slate and having, therefore, less friction on the stone will acquire sufficient momentum to jump across the intervening space between the deflector and the pan H, while the coal, being lighter than either the slate or bone, will be thrown farther than either and drop into the pan I. We prefer to arrange these pans in the manner shown more particularly in Fig. 2, in which it will be observed that the lower pan H has an inclined front wall *i* projecting toward the deflector E and is provided with side walls i', which are raised to a considerable height above the body of the pan. These side walls carry at

their upper edges laterally-extending flanges i^2, which rest upon the upper faces of the frame-bars 1. The side walls h of the upper pan I (which is open at its upper or front end) are preferably of such a height that the bottom h' of the pan is approximately on a line with the upper edge of the incline i. The side walls h likewise have lateral flanges which rest upon the upper faces of the flanges of pan H, and by reason of these flanges it will be observed that the pans H and I may each be adjusted nearer to or farther from the deflector E, being held in any desired position by means of a clamp-nut S, threaded upon a bolt projecting up through alining slots s' in the flanges.

It is desirable to provide connections for simultaneously moving the pans H and I, but to different degrees, and it is also desirable that these connections shall be independently adjustable. To this end we employ a lever G upon each side of the separator connected by a rock-shaft, so as to move simultaneously, one or both of the levers being extended to provide a suitable operating-handle. Rods K and L extend, respectively, from the lever G to the pans H and I, being connected to ears k and l on the flanges thereof; but it will be observed that the rod K is connected to the lever G nearer the fulcrum thereof, so that on the rocking of the lever both pans will be moved, but the upper pan I to a greater distance, and thus not only will the distance of both pans from the deflector be varied, but also the distance between the upper edges of the pans themselves.

In order to vary the amount of movement of each pan, slots k' and l' are provided in the lever G, with which the rods K and L are respectively connected by means of a suitable clamp-nut and bolt, by means of which the connecting-point of either of the rods, or of both, may be moved nearer to or farther from the fulcrum of the lever G.

In order to provide for the individual adjustment of the pans, we provide a series of openings m or n in the rods K and L, into any one of which the connecting-bolts may be shifted.

As hereinbefore stated, suitable friction means are provided to retard the motion of the feed-wheel. These means are shown in Figs. 4 and 5, Fig. 4 being a side elevation of the shaft-bearing, and Fig. 5 a plan view thereof. A bearing N, supported by the frame, receives the shaft a of the feed-wheel, and this bearing-block has a cut-away portion leading to the shaft, in which slides a friction-block R, adapted to bear against a portion of the shaft. A yoke T, connected with the bearing, carries an adjusting-screw O, which bears against the friction-block and by means of which the said block may be caused to press with more or less friction against the shaft, being locked in its adjusted position by a lock-nut o. By this means more or less friction may be applied to the feed-wheel to cause it to drop varying quantities of material upon the screen-plate to suit the requirements of the work. We prefer to form the feed-wheel in the manner shown, in which a five-sided body portion A' is mounted upon a suitable shaft and is provided with wings A^2, secured to said flat sides and projecting therefrom to form buckets or pockets.

We have found by experience that five buckets or pockets give the best result.

Having thus described our invention, what we claim is—

1. A separator comprising the chute, upper and lower parallel receiving-pans located in proximity to the discharge end of the chute, and means for simultaneously adjusting both said pans toward and from the chute but to different degrees, substantially as described.

2. A separator comprising a chute, upper and lower receiving-pans located in proximity to the discharge end thereof, connections for simultaneously moving said pans toward and from the chute but to different degrees, and means for adjusting said connections to vary the amount of movement of each pan, substantially as described.

3. A separator comprising a chute, upper and lower receiving-pans located in proximity to the discharge end thereof, connections for simultaneously moving said pans toward and from the chute, and means for adjusting said connections to move one pan independently of the other, substantially as described.

4. A separator comprising the frame-bars, the chute having a deflector, the upper and lower pans having lateral flanges resting on said bars, means for moving said pans toward and from the chute, and means for clamping them in their adjusted position, substantially as described.

5. A separator comprising the frame-bars, the chute having a deflector at its lower end, the lower pan having upwardly-extended side walls and lateral flanges resting upon the frame-bars, the upper pan having side flanges resting upon the flanges of the lower pan, and the clamping means engaging the flanges and adapted to permit adjustment of both pans and to clamp them in their adjusted position, said upper and lower pans being located in proximity to said deflector, substantially as described.

6. A separator comprising the frame, the chute pivotally supported therein, the deflector pivoted at the lower end thereof, means for simultaneously varying the inclination of the chute and deflector, and the pans located in proximity to the deflector, substantially as described.

7. A separator comprising the frame, the chute pivotally supported therein, the deflector pivotally supported at the lower end of the chute, and means for simultaneously but inversely varying the inclination of both chute and deflector, substantially as described.

8. A separator comprising the frame, the

chute pivotally supported by the frame the deflector also pivotally supported by said frame, means for varying the elevation of the lower end of the chute, and the loose connection between the chute and deflector whereby the adjustment of the former also effects the adjustment of the latter, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

ERNEST D. CARYL.
CHARLES S. SNYDER.

Witnesses:
H. E. YEWENS,
W. W. INGLIS.