No. 633,995. Patented Oct. 3, 1899.

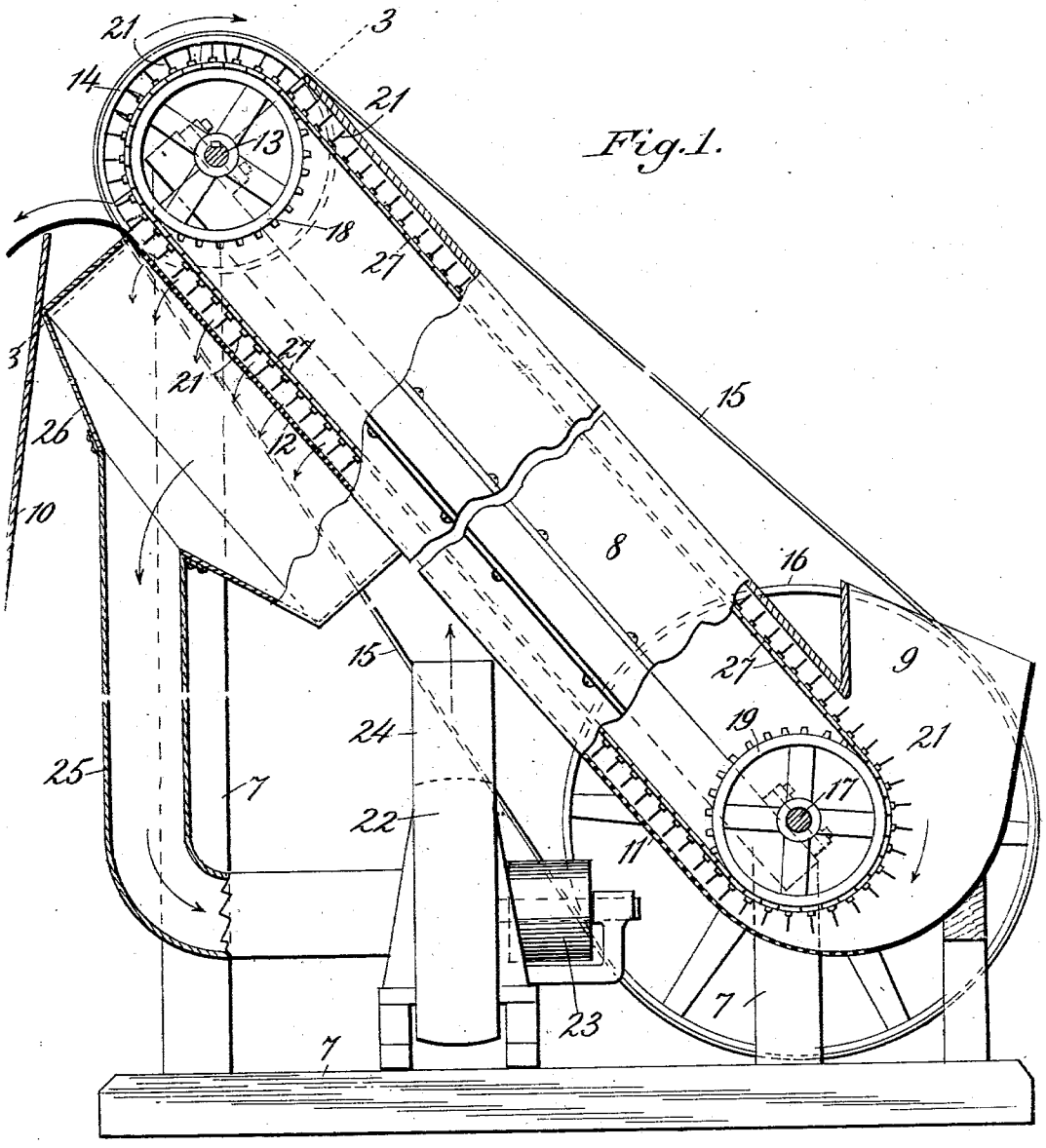
J. W. GRAVES.

CLEANER AND CONVEYER FOR SEED COTTON.

(Application filed Feb. 8, 1898.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.




Witnesses

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Fig. 2.

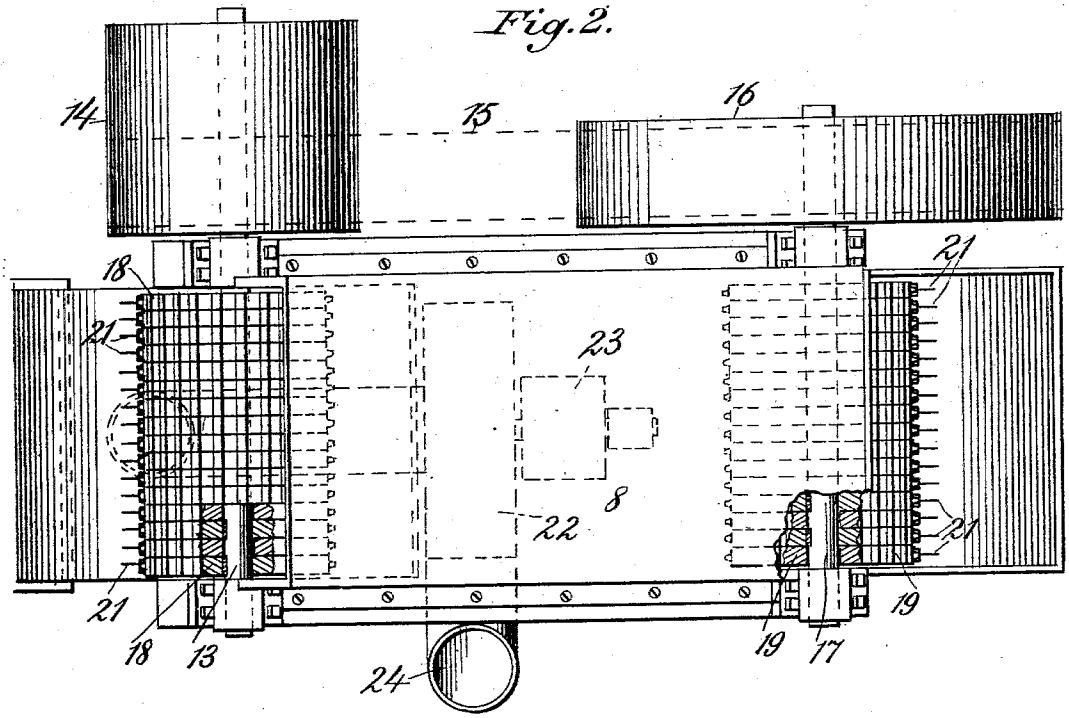
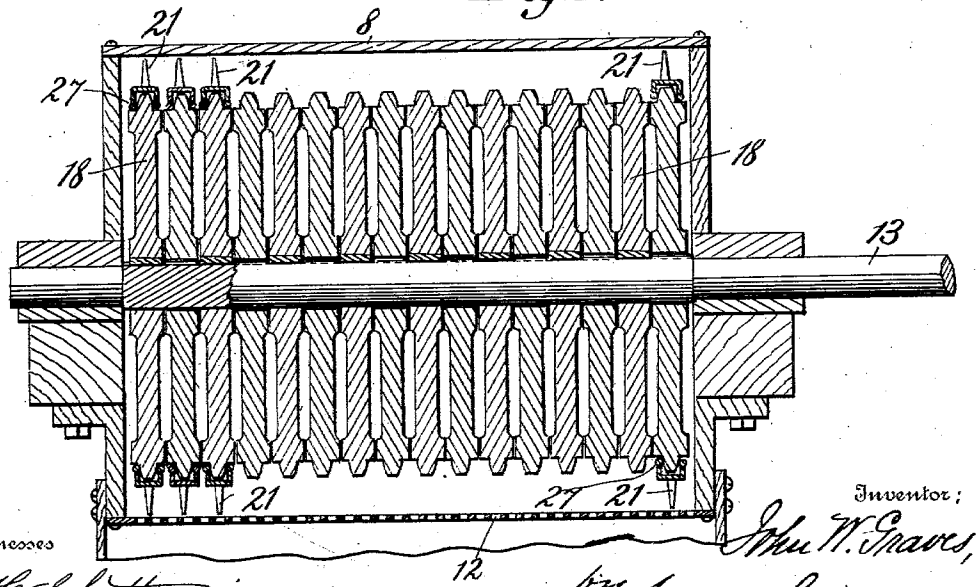



Fig. 3.




Witnesses

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Fig. 4.

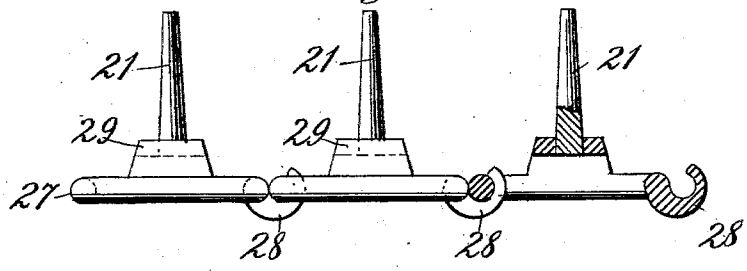



Fig. 5.

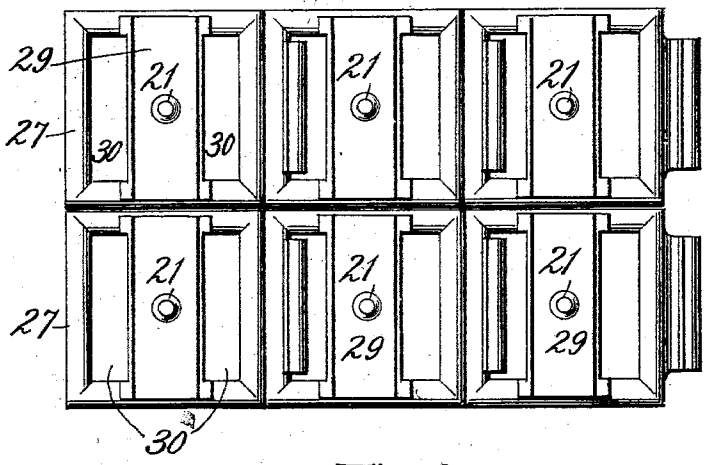
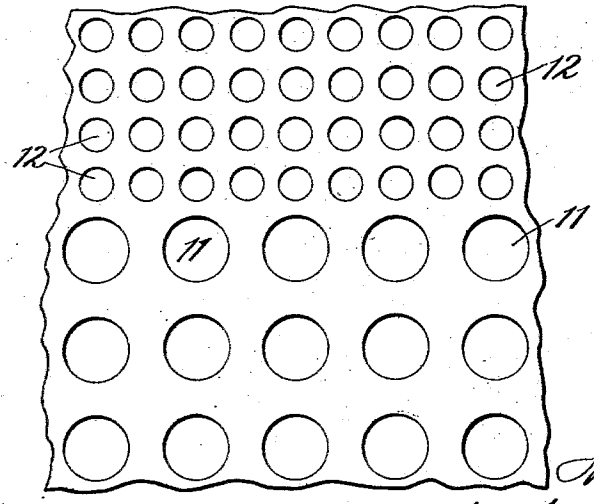



Fig. 6.




Witnesses

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# UNITED STATES PATENT OFFICE.

JOHN W. GRAVES, OF LITTLE ROCK, ARKANSAS.

## CLEANER AND CONVEYER FOR SEED-COTTON.

SPECIFICATION forming part of Letters Patent No. 633,995, dated October 3, 1899.

Application filed February 8, 1898. Serial No. 669,603. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN W. GRAVES, a citizen of the United States, residing at Little Rock, in the county of Pulaski and State of Arkansas, have invented certain new and useful Improvements in Cleaners and Conveyers for Seed-Cotton; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain new and useful improvements in cleaners and conveyers for seed-cotton preparatory to the usual ginning operation.

A characteristic feature of my invention consists in a construction and arrangement of endless belts or sprocket-chains located side by side and provided with projecting points or fingers adapted to engage the seed-cotton and convey it onwardly over the surface of a perforated screen, the alternate members of the series of belts traveling at different speeds, so as to effectually disintegrate the material and pull it apart, agitate it, and roll it over while it is passing over the screen, so as to effectually liberate the dust, dirt, leaves, and other substances which it is desired to separate. As will hereinafter more fully appear, the construction just referred to also serves to prevent any possible choking of the feed at the point of entrance or supply of the seed-cotton to the traveling chains at the foot of the incline.

A further main characteristic feature of my invention consists in providing the apparatus with means for inducing the passage of air through a greater or less number of the screen-perforations, and particularly at the front part of the screen, where the perforations are preferably smaller than those at the rear part thereof. In my preferred embodiment of this feature of the invention I avail myself of an exhaust-fan for inducing the passage of the body of air through the screen-perforations referred to, although I desire it to be understood that my invention in this respect contemplates the employment of any suitable means for producing an air-current therethrough, whether through the instrumentality of an exhausting device arranged below the screen or of a blast device arranged above it and directing the current of air upon and through the cotton or a combination of the two expedients.

My invention relates, further, to certain combinations of parts and details of construction, as hereinafter described, and particularly pointed out in the claims forming a part of this specification.

In the accompanying drawings, Figure 1 represents a side elevation, partly in section, of an apparatus embodying my invention. Fig. 2 represents a top plan view thereof, partly in section. Fig. 3 represents, on a larger scale, a longitudinal section of one of the series of sprocket-gears forming a part of the apparatus and illustrates its relation to the adjacent parts, and particularly to the links of the sprocket-chains themselves. Fig. 4 represents a side elevation, partly in section, of a portion of one of the sprocket-chains. Fig. 5 represents a top plan view thereof; and Fig. 6 represents a fragmentary view of the screen over which the seed-cotton is conveyed, illustrating the preferred difference in size of the openings for the lower and upper portions of the screen.

Similar numerals of reference indicate similar parts throughout the several views.

Referring to the drawings, 7 indicates the timbers of any suitable framework upon which the operating parts of the apparatus are adapted to be mounted.

8 indicates a conveyer-box open at both ends and provided at its lower extremity with a flaring mouth or hopper 9 for the convenient admission of the seed-cotton from the wagon or other source of supply. At the upper portion of the conveyer-box a suitable guide-board 10 is located for directing the cleaned cotton at its exit from the apparatus to any suitable storage-receptacle or directly to the cotton-gins.

The inclined bottom of the conveyer-box 8 is provided with a screen, preferably of metal. The perforations 11 of the lower portion of the screen-bottom are preferably larger than the perforations 12 of the upper portion thereof. In practice I prefer to make the perforations 11 of, say, twice the diameter that I give to the perforations 12, as indicated, for instance, in Fig. 6. Thus a convenient diameter for the perforations 11 will be one-

half an inch and for the perforations 12 one-fourth of an inch. The function of making this differentiation between the size of the perforations 11 and the size of the perforations 12 is that free exit may be given to the larger and coarser particles of dirt released during the passage of the cotton over the lower portion of the screen, while the perforations of the upper portion of the screen which is in communication with the pneumatic device or exhauster are of sufficient capacity to permit the passage of the finer particles of dirt and dust released thereat and carried through by the air-current, yet suffice to prevent the passage of portions of the seed-cotton which might otherwise be forced through them under the influence of the suction or blast.

At the upper end of the conveyer box or trunk 8 is mounted in suitable bearings a shaft 13, driven by a belt-pulley 14, which may receive a movement of rotation from any suitable source of power. From the pulley 14 a driving-belt 15 extends to the pulley 16, which is fixed upon a shaft 17 at the lower end of the conveyer-box. It will be noted that the diameter of the pulley 16 is greater than the diameter of the pulley 14, and this difference in diameter I preferably make in the ratio of two to one, so that the shaft 17 will revolve at half the speed of the shaft 13 for a purpose to be presently described.

Upon the shaft 13 are located side by side a series of sprocket-gears 18. Alternate members of this series of sprocket-gears are keyed or splined upon the shaft 13, as indicated in Fig. 3, and the intermediate alternate members of the series are loose or idle upon the shaft, as also indicated in that figure. Similarly a like series of sprocket-gears 19 is mounted upon the lower shaft 17 of the apparatus and in like manner alternate members of the said series are fixed upon the shaft 17, the intermediate members of the series being loose thereon. It is further to be observed, as indicated in Figs. 1 and 2, that the fixed sprocket-gears of the shaft 13 correspond in location to the idle sprocket-gears of the shaft 17 and that the idle sprocket-gears of the shaft 13 correspond in location to the fixed sprocket-gears of the shaft 17. It will consequently be apparent that this arrangement causes those sprocket-chains which pass over the fixed sprocket-gears of the pulley-shaft 13 to travel at twice the speed of the sprocket-chains which pass over the sprocket-gears that are fixed to the shaft 17. The sprocket-chains, as shown, are provided with projecting points or fingers 21, and consequently as the cotton travels upwardly over the inclined face of the screen it is subjected to the action of the disintegrating projections or fingers upon the conveyer-chains, the alternate members of which travel at different speeds, in this instance the difference in speed being in the ratio of two to one. The body of cotton conveyed instead of traveling as a compact mass over the face of the screen is, by reason of the difference in speed of the alternate series of conveyer-chains, constantly pulled apart, agitated, shaken, and rolled over, so as to effectually loosen and sift out the dirt and other foreign substances contained therein. The greater part of these foreign substances passes through the larger perforations 11 at the lower part of the screen.

It will be further apparent that because of the different rates of speed at which the alternate members of the sprocket-chains travel it is practically impossible for the apparatus to be choked or obstructed by an accumulation of compacted cotton at the foot of the incline. This is prevented by reason of the fact that the chains which travel the more rapidly act upon one-half of the cotton accumulated in the lower portion of the apparatus, while the alternate and more slowly-running chains serve to relatively retard the remainder of the cotton. This divided action of the two sets of conveyer-chains upon the material entirely obviates all danger of having the apparatus choked or obstructed at the point indicated.

In order to assist the escape of the more finely-divided dirt and dust from the traveling body of cotton at the upper portion of the inclined screen, I provide, as hereinbefore specified, a pneumatic device for causing the current of air to pass through the body of cotton thereat and to convey with it the remaining separated dust and dirt. The current of air for this purpose may either be positively forced through the cotton by a blower located within the conveyer-box 8 or may be induced through the cotton by an exhauster. In the drawings I have illustrated a suitable construction wherein an exhauster is employed, the same consisting of an exhaust-fan 22, adapted to be operated from a pulley 23 or the like and having a discharge-pipe 24, which may open into the atmosphere or into any suitable dust-collector. The fan illustrated is of the type receiving its supply axially and communicates by a conduit 25 with a trunk or box 26, extending below the upper series of perforations 12 of the screen. During the operation of the apparatus the fan is operated to cause a current of air to pass through the traveling body of cotton at the upper portion of the screen and into the trunk 26, from which it passes through the conduit 25, fan 22, and exhaust-pipe 24, carrying with it the particles of dust and dirt which are constantly being sifted out from the upper portion of the traveling material by reason of the constant pulling apart, turning over, and agitation to which it is subjected.

It will be noted by reference to Figs. 4 and 5 that the sprocket-chains are of such construction as to leave ample space for the passage of air to the body of cotton. In these figures the chains are illustrated as composed of a series of links 27 of generally rectangular outline, said links being provided with

terminal hooks 28 for engagement with the cross-bars of the proximate links of the series. From the side bars of the links extend the bridge-pieces 29, arched upwardly, as shown, so that ample openings 30 are left for the passage of air to the cotton on the screen. The bridge-pieces 29 are conveniently cast integrally with the links and the castings are thereupon malleableized. The projections or fingers 21 may likewise be cast integral with the links or they may be separate and driven into an opening in the bridge-piece, both of these constructions being illustrated in Fig. 4.

So far as I am aware it is broadly new in apparatus of the class to which this invention belongs to carry the seed-cotton over the screen by endless conveyers of any kind arranged side by side and traveling at different rates of speed, so that the conveyer-teeth have a disintegrating action upon the moving body of cotton during transit. While I prefer sprocket-chains for this purpose and prefer to operate them by the mechanism described, I desire to be understood that in so far as my broad claims are concerned I do not limit myself to the employment of sprocket-chains nor to any particular means for imparting to them the desired relative speeds of travel, inasmuch as equivalents therefor will readily suggest themselves to those skilled in the art.

Having thus described my said invention, what I claim is—

1. In a cotton-cleaner, a screen, a series of adjacent conveyer-chains having projecting fingers, said chains traveling along the face of the screen, and means for imparting different rates of speed to individual members of the series.

2. In a cotton-cleaner, a screen, a series of adjacent conveyer-chains having projecting fingers, said chains traveling along the face of the screen, and means for imparting to the odd members of the series a different rate of speed from that of the even members thereof.

3. In a cotton-cleaner, a screen, a series of adjacent conveyer-chains, a front and a rear series of sprocket-gears, alternate members of each series being respectively fixed and idle upon their shafts, each chain engaging a fixed sprocket of one shaft and an idle sprocket of the other shaft, and means for driving the shafts at different rates of speed.

4. In a cotton-cleaner, a screen, a series of adjacent conveyer-chains, a front and a rear series of sprocket-gears alternate members of each series being respectively fixed and idle upon their shafts, each chain engaging a fixed sprocket of one shaft and an idle sprocket of the other shaft, and driving-pulleys of different sizes on the two shafts, the one pulley being driven from the other.

5. In a cotton-cleaner, the combination with a screen, of a series of adjacent conveyer-chains, and means for imparting to alternate members of the series different rates of speed, said means consisting of two terminal series of sprocket-gears engaging the chains, the alternate members of each series being fixed and idle respectively, and means for driving the two sets of fixed sprocket-gears at different rates of speed.

6. In a cotton-cleaner, a conveyer-chain having links provided with arched bridge-pieces leaving space for the passage of air through the links, and fingers projecting from the bridge-pieces.

7. In a cotton-cleaner, a conveyer-chain having links of general rectangular contour, said links being provided with arched bridge-pieces and with passages on each side of the bridge-pieces for the passage of air through the links, and fingers projecting centrally from the bridge-pieces.

8. In a cotton-cleaner, a screen provided at the supply end with apertures of larger area than those at the discharge end, a disintegrating-conveyer having conveyer elements which travel at different speeds relatively to each other, and means for producing a current of air through the latter apertures.

9. In a cotton-cleaner, a screen, a disintegrating-conveyer having conveyer elements which travel at different speeds relatively to each other, thereby carrying the cotton over the screen, pulling it apart, and agitating it during transit, and a pneumatic device for causing a current of air to pass through the screen.

10. In a cotton-cleaner, a screen, a disintegrating-conveyer having conveyer elements which travel at different speeds relatively to each other, thereby carrying the cotton over the screen, pulling it apart, and agitating it during transit, and an exhauster for inducing an air-current through the screen.

11. In a cotton-cleaner, the combination with a conveyer box or trunk having a feed-hopper at one end, of a series of disintegrating conveyer-chains traveling at different speeds relatively to each other, a screen above which said conveyer-chains travel, and a pneumatic device for producing a current of air through perforations of the screen.

12. In a cotton-cleaner, the combination with a conveyer box or trunk having a feed-hopper at one end, of a series of disintegrating conveyer-chains traveling at different speeds relatively to each other, a screen above which said conveyer-chains travel, said screen being provided with apertures of different sizes, and an exhauster for producing a current of air through the smaller apertures.

13. In a cotton-cleaner, the combination with a conveyer-box having a feed-hopper at one end, of shafts located respectively at each end of the box, series of sprocket-gears upon said shafts alternate members of which are fixed and idle respectively, sprocket-chains engaging each a fixed sprocket-gear on one shaft and an idle sprocket-gear on the other shaft, connections for driving one of the shafts

at a different rate of speed than the other, and a screen above which the sprocket-chains travel.

14. In a cotton-cleaner, the combination with a conveyer-box having a feed-hopper at one end, of shafts located respectively at each end of the box, series of sprocket-gears upon said shafts alternate members of which are fixed and idle respectively, sprocket-chains engaging each a fixed sprocket-gear on one shaft and an idle sprocket-gear on the other shaft, connections for driving one of the shafts at a different rate of speed than the other, a screen above which the sprocket-chains travel, said screen being provided with apertures of different sizes, and an exhauster for producing a current of air through a portion of the perforate screen.

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

JOHN W. GRAVES.

Witnesses:
JOHN C. PENNIE,
HUGH M. STERLING.