

(No Model.)

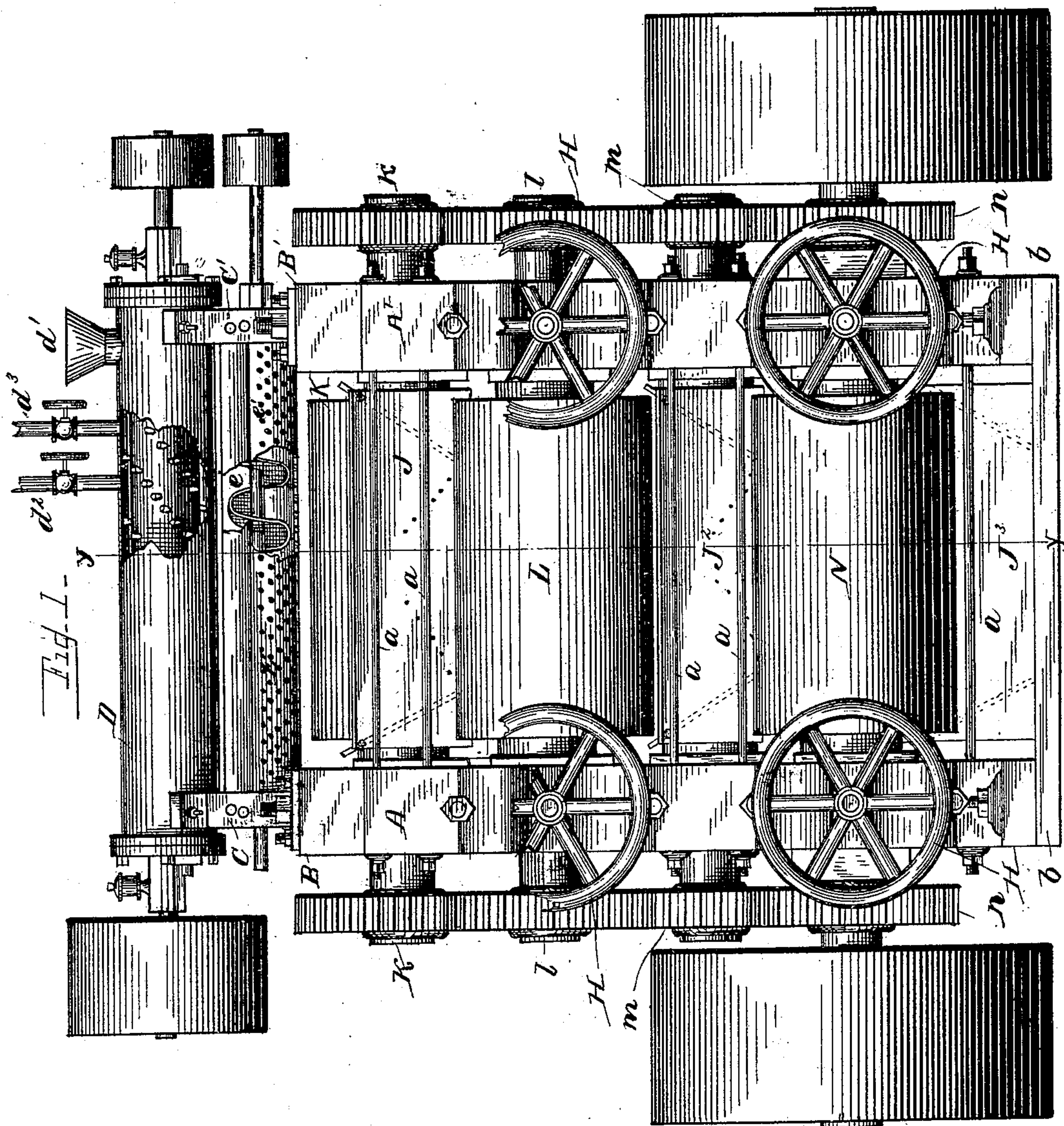
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J. F. GENT.

MACHINE FOR MAKING SHEET OR FLAKE PRODUCTS.

No. 395,893.

Patented Jan. 8, 1889.



Witnesses,

G. A. Tauberschmidt

S. O. W. P. H. K. R.

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By his Attorney:

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4 Sheets—Sheet 2.

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L. B. Whitaker.

Inventor,
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Whitaker & Brewster

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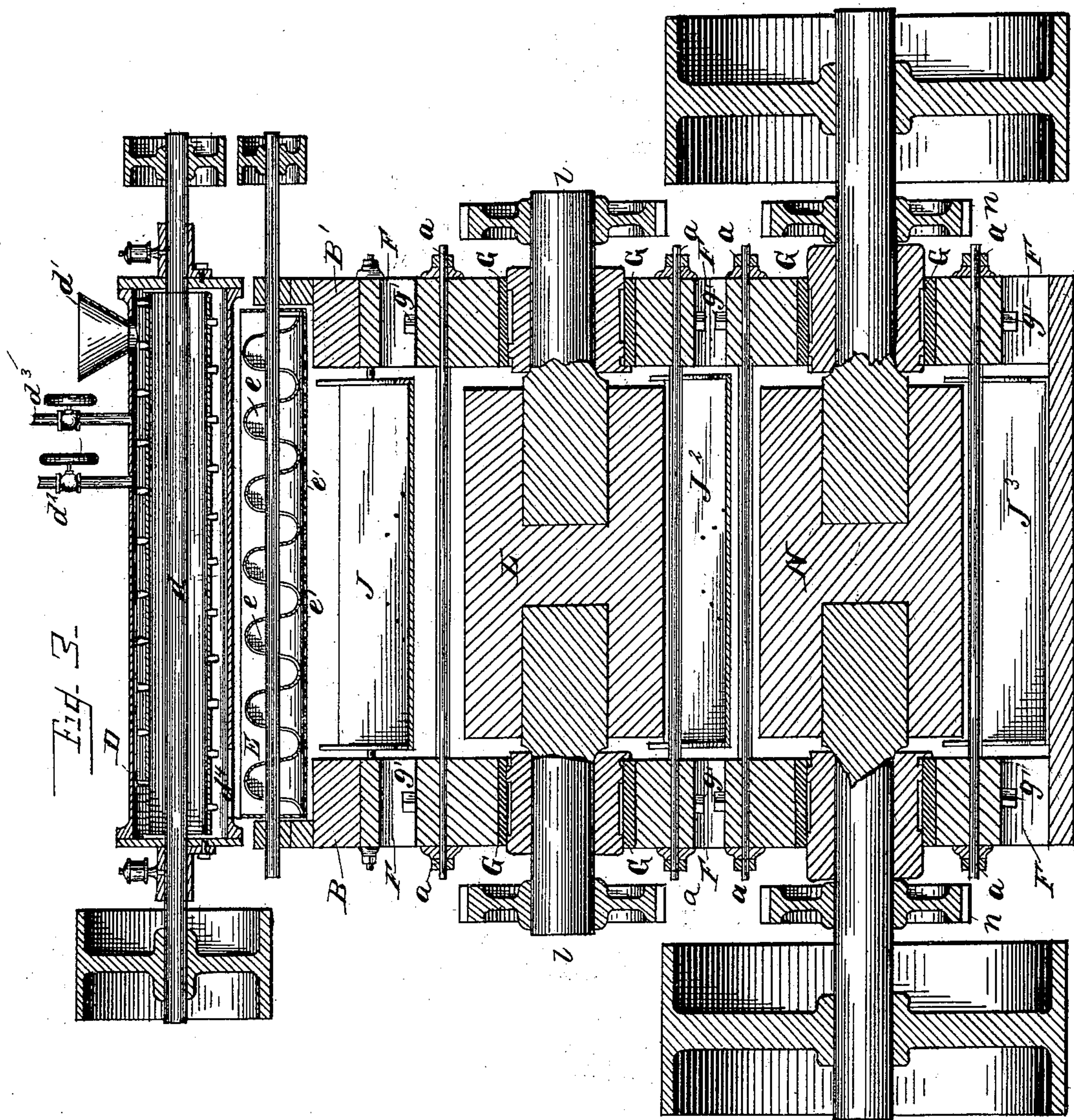
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G. A. Tauberschmidt,

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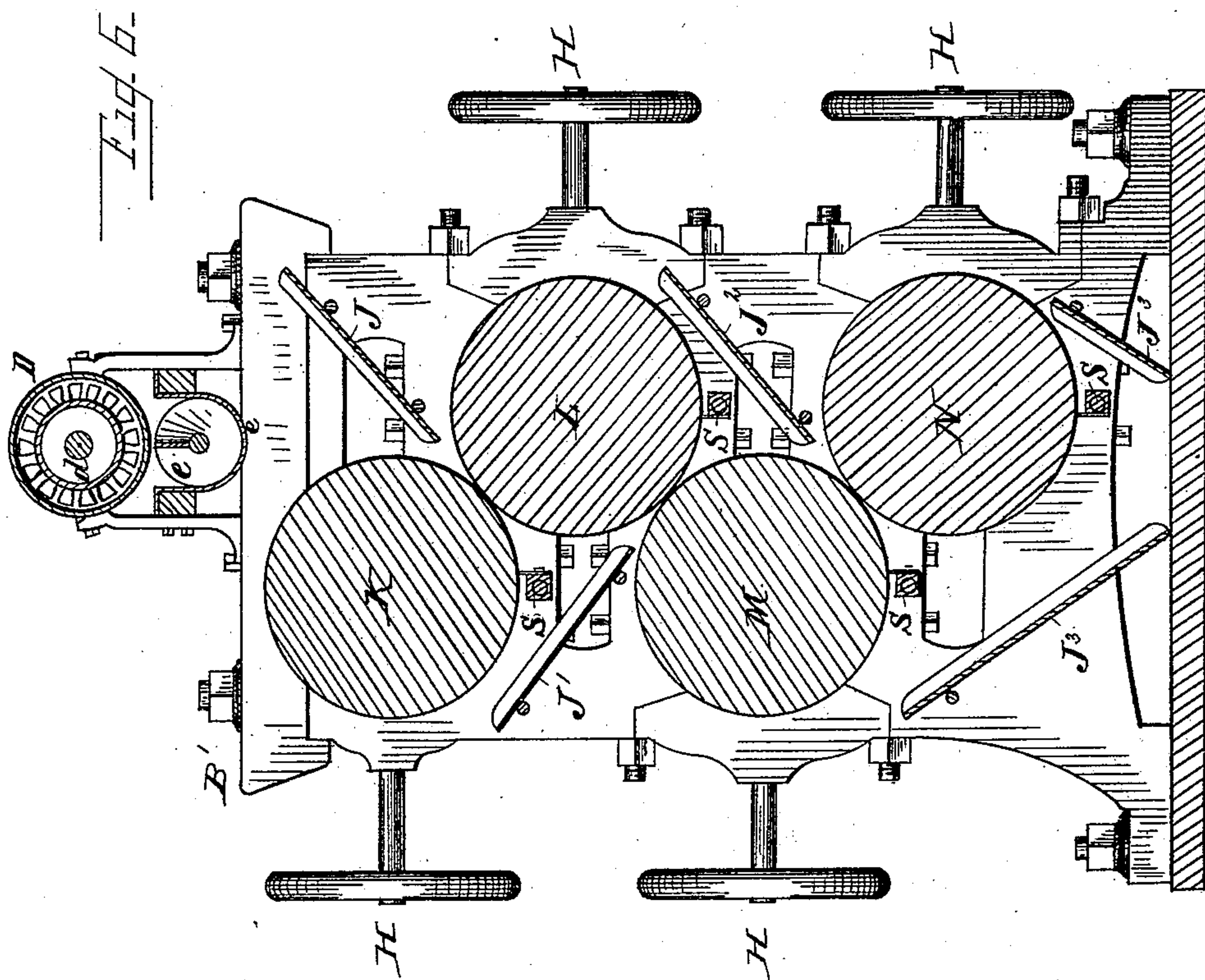
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UNITED STATES PATENT OFFICE.

JOSEPH FRANKLIN GENT, OF COLUMBUS, INDIANA.

MACHINE FOR MAKING SHEET OR FLAKE PRODUCTS.

SPECIFICATION forming part of Letters Patent No. 395,893, dated January 8, 1889.

Application filed January 28, 1888. Serial No. 262,206. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH FRANKLIN GENT, a citizen of the United States, residing at Columbus, in the county of Bartholomew and State of Indiana, have invented certain new and useful Improvements in Machines for Making Sheet and Flake Products from Cereals; 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 machines for producing a sheet or flaked product from cereals; and it consists in certain improvements upon the machine for which Letters Patent No. 347,790 were granted to me August 24, 1886.

The peculiar features of construction and combination of parts which constitute my present invention are illustrated in the accompanying drawings, and said invention is fully described in the following specification and claims.

In the drawings, Figure 1 is a front elevation of my improved machine, parts being broken away. Fig. 2 is a cross-section through one of the side pieces of the main frame of the machine. Fig. 3 is a section on line $x x$ of Fig. 2. Figs. 4 and 5 are detail views of parts of the machine; and Fig. 6 is a vertical transverse section on line $y y$, Fig. 1.

The main frame of the machine consists of the side pieces, A and A', which are provided with the cap-plates B and B', secured thereto by bolts or screws. The side pieces are held firmly together by long rods or bolts a , and the machine may be provided with a base-plate, b , if desired, although this is not essential, as the side pieces may rest upon the floor. Upon the cap-plates B and B' are mounted the vertical standards C C' C', which support the cylinder D and trough or receptacle E.

Upon a shaft mounted in bearings in the ends of cylinder D is a cylindrical roller, d , which may be hollow or solid, as preferred, and which is provided with projections upon its outer surface, extending nearly to the inner surface of the cylinder D. These projections are arranged spirally upon the cylindrical roller, as will be hereinafter more fully described. The shaft of the roller a may be

provided with suitable band or other pulleys for receiving motion from a running shaft, as may be found convenient.

Upon its upper outer surface the cylinder D is provided with a funnel-shaped receptacle or hopper, d' , discharging into the interior of the cylinder, for the introduction of the crushed or ground cereal, and the cylinder is also provided with two pipes, $d^2 d^3$, for the admission of steam and hot water. At the end farthest from the receptacle d' an aperture, d^4 , is formed in the bottom of the cylinder, which opens into the trough or receptacle E. The receptacle E is in this instance supported by bolts passing through its sides and securing it to the standards C C' C', as shown in Fig. 2, and contains a screw conveyor, e , Figs. 1, 2, and 3, the shaft of which is provided with a suitable band-pulley. The curved bottom of this receptacle E is provided with holes or openings e' , as best shown in Fig. 1.

The side pieces of the main frame are provided with openings or recesses F, and larger openings to receive the bearings G' of rollers K, L, M, and N. The rollers K and M are mounted the one above the other, and the rollers L and N are also mounted above one another, but in a different vertical plane from the rollers K and M. The roller L comes in contact and bears against rollers K and M, and the latter roller comes in contact with and bears against the rollers L and N, giving three distinct and separate compressions of the material between the four rollers, as shown in the drawings, the first being between K and L, the second between L and M, and the third between M and N. By this means I effect the same number of compressions of the material with four rollers as would be effected by six rollers arranged as shown and described in my former patent. To effect these compressions in the manner desired, it is necessary that the rollers should be adjusted so that each roller shall bear with the proper force upon the other or others with which it comes in contact. To accomplish this result, I provide the upper and lower faces of the openings which receive the bearings with recesses to receive the screw-threaded bolts or nuts g . Through apertures which connect the open-

ings F with the recesses containing the nuts *g* are passed bolts *g'*, provided at one end with screw-threads to engage the threads of the nuts *g*, and at the other end with square or polygonal heads. The interior of the bearing-recess is also provided with plates *G* on the upper and lower sides of the bearing and in contact with the ends of the bolts *g'*. By turning the bolts *g'*, to the heads of which access may be had through the openings F, the vertical adjustment of the rollers is secured.

The outer side of the bearing-recess is provided with a recess or slot for the reception of a nut, *h*, similar to the nut *g*. The wall of said bearing-recess is perforated to receive a rod, *h'*, provided at one end with screw-threads to engage the threads of the nut and at the other end with a hand-wheel, *H*. By means of these hand-wheels and the other devices just described every degree of adjustment may be secured and the contact of each roll with its adjacent roll or rolls regulated at will.

In order to facilitate the removal of any roller from the machine without disturbing the adjustment of the other rolls, I prefer to provide a casting to serve as the outer wall of the bearing-recesses for the three lower rolls, as shown in Figs. 2 and 5. These castings are provided with a central aperture, through which the rod *h'* passes, and its inner face is provided with the slot *h''*, to receive the nut *h*. This slot may extend across the inner face of the casting or may be simply a recess of the proper size and shape, as preferred. The upper and lower extremities of this casting are provided with curved notches to provide for the passage of the bolts *h''*, which are added into the frame of the machine and provided on their outer ends with nuts which hold the castings firmly in place. The castings forming a part of the recesses of the bearings of the lower roll, *N*, are provided at their lower ends with projections conforming to the contour of the side pieces of the machine, as shown in Fig. 2. I may not provide all the recesses with these castings to form the front rolls, as in the case of the recess for the bearings of roller *K*; but I prefer to use this construction when convenient and practicable.

The shafts of the rollers are provided at one or both sides of the machine with cog-wheels *k l m n* in gear with each other, so that all the rollers employed move simultaneously, and the shaft of one of the rollers is also provided with one or more band-pulleys, to which power may be applied.

The gear-wheel driving the roller *K* may be greatly smaller by one or more cogs or teeth than the gear on roller *L*, with which it engages, for the purpose of giving these rollers differential motion. This difference in the movement of the two rollers enables me to more thoroughly break up and disintegrate the cellular parts of the constituents of the material passing between them.

Directly under the openings in the bottom of the receptacle *E* is a slanting chute, *J*, (best seen in Fig. 3,) which directs the material dropped upon it to the rollers *K* and *L*. This chute, as shown in Fig. 4, is provided with side pieces, *j*, which keep the material from falling over the ends of the chute. The side pieces are pivoted at the upper end to the bottom of the chute, and the lower end may be moved in and toward the center of the same and secured at different points by any preferred means. In this instance I have shown it secured by means of a bolt or pin, *j''*, passing through the side piece, *j*, and through one of the holes *j'* in the bottom of the chute. By this means the material may be delivered to the rolls in a wider or narrower stream, as desired.

Beneath the roller *K* is another chute, *J'*, similar to the chute *J*, which delivers material to the rollers *L M*, and beneath the roller *L* is another chute, *J''*, delivering the material to rollers *M N*. At the lowest part of the machine is placed a chute, *J'''*, to receive the material in its completed state and convey it away from the machine.

The rollers may be made hollow and provided with hollow shafts, so that a circulating medium may be supplied for the purpose of heating or cooling them. In order to keep the rollers clean, I provide the scrapers *S*, (best seen in Fig. 6,) which remove the material which adheres to the rolls and cause it to fall upon the chute below the same.

The operation of my machine is as follows: The cracked or ground cereal to be treated is supplied through the funnel-shaped receptacle *d'* to the cylinder *D*, to which is admitted steam through pipe *d''*, and a sufficient quantity of hot water through pipe *d'''*, which, with the steam, will moisten the cracked or ground cereal. The steamed and moistened mass is continually stirred by the projections on the cylindrical roller *d*, which are so arranged as to feed the material toward the opening *d''* in the bottom of the cylinder *D*, where it drops into the receptacle *E*. In this receptacle it is taken up by the screw conveyer and carried along the receptacle *E*, and at the same time it is gradually forced or squeezed through the openings in the bottom of the same, where it drops upon the chute *J* and is fed to the rollers *K* and *L*. In passing through these rollers the cereal is compressed and disintegrated, and upon leaving the rolls falls upon the chute *J'* and is fed to the rollers *L* and *M*, where it is a second time subjected to compression and is guided by chute *J''* to rollers *M* and *N*, where it again is compressed and leaves the machine in flakes or sheets through the chute *J'''* at the bottom of the same.

While I have shown and described four rollers in my machine, I do not wish to be limited to the exact number, as I may use a greater or less number if found desirable, and in other ways I do not desire to be limited

to my exact constructions, as many variations may be made therefrom without departing from the spirit of my invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for macerating and flaking cereal materials, the combination, with the compressing-rollers, of the feeding device therefor, consisting of a cylinder having a feed-opening at the top at one end and a discharge-opening at the bottom at the opposite end, a trough having a series of fine perforations in the bottom of the same beneath the cylinder, a stirring device for said cylinder and a conveyer for said trough, the said stirring device being adapted to move the material from its feed-opening to its discharge-opening, and the conveyer adapted to move the material in the opposite direction, substantially as described.

2. In a machine for macerating and flaking cereal materials, the combination, with the compressing-rollers, of the feeding device therefor, consisting of a cylinder having a feed-opening at the top at one end and a discharge-opening at the bottom at the opposite end, and steam and water inlet pipes, a trough having a series of fine perforations in the bottom of the same beneath the cylinder, a stirring device for said cylinder, and a conveyer for said trough, the said stirring device being adapted to move the material from its feed-opening to its discharge-opening, and the conveyer adapted to move the material in the opposite direction, substantially as described.

3. In a machine for macerating and flaking cereal materials, the combination, with the supporting-frame and the rollers, the said frame being provided with recesses in different horizontal and vertical planes, and having bearings for the rollers in said recesses, of adjusting-screws mounted in said frame engaging the bearings above and below the same, whereby the vertical adjustment of said rollers is secured, substantially as described.

4. In a machine for macerating and flaking cereal materials, the combination, with the supporting frame and rollers, the said frame

being provided with bearing-recesses and recesses above and below said bearing-recesses, of bearings for the rollers within said bearing-recesses, and screws above and below each of said bearings extending into the recesses of the frame above and below the bearing-recesses, substantially as described.

5. In a machine for macerating and flaking cereal materials, the combination, with the main frame provided with open bearing-recesses in different horizontal and vertical planes, said recesses opening on opposite sides of the frame, of movable bearings in said recesses, rollers mounted in said bearings, castings detachably secured to the main frame and closing the open side of said bearing-recesses, and screws passing horizontally through said castings and impinging against said bearings, substantially as described.

6. In a machine for macerating and flaking cereal materials, the combination, with the main frame having a bearing recess open on one side of the same, and recesses above and below said bearing-recess, of a bearing in said bearing-recess, screws above and below said bearing, extending into the recesses above and below said bearing-recess and engaging the bearing, a casting detachably secured to the frame and closing the open side of the bearing-recess, and a screw passing through said casting and engaging said bearing, substantially as described.

7. In a machine for macerating and flaking cereal materials, the combination, with the compressing-rollers, of a feeding-chute for the same, having the upper ends of its side pieces pivoted near the upper edge of the chute, and the free ends adapted to be secured at different points adjacent to the lower edge of the same, whereby the width of the delivery edge of the said chute can be regulated, substantially as described.

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

JOSEPH FRANKLIN GENT.

Witnesses:

L. P. WHITEKER,

G. A. TAUBERSCHMIDT.