

Sheet 1. 2 Sheets.

I. Hayden.
Cotton Picker.

N^o 29,971

Patented Sept. 11, 1860.

Fig. 1.

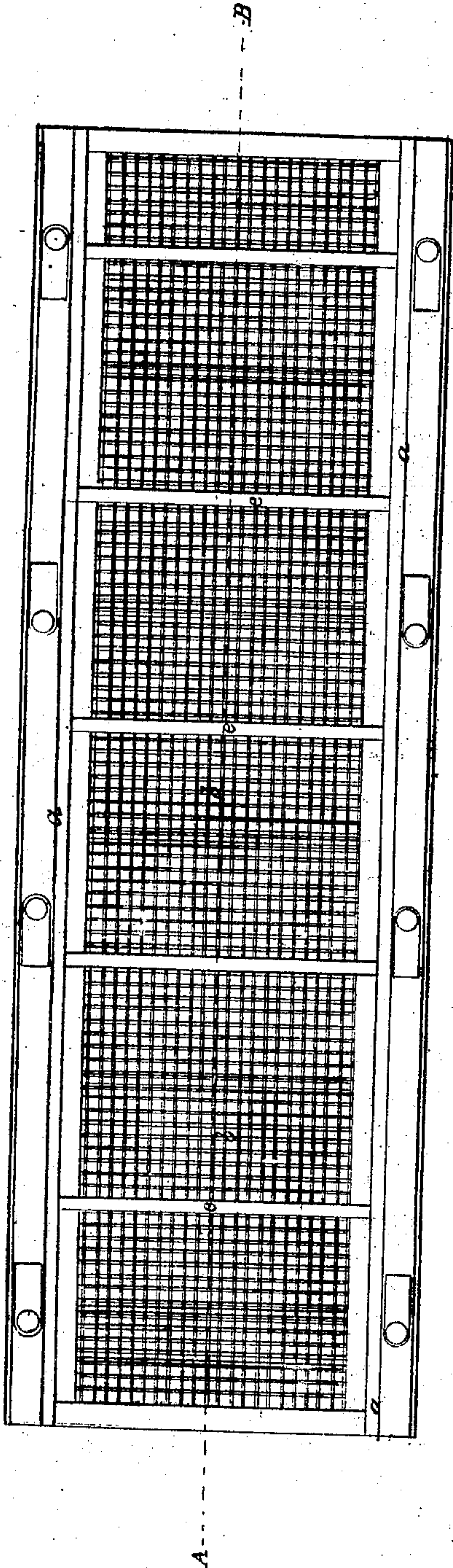
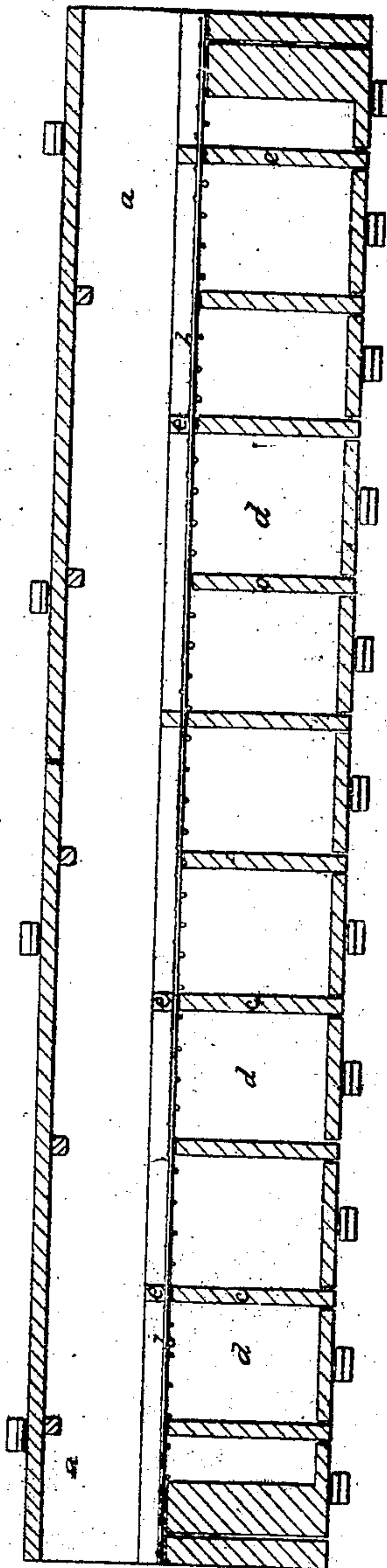


Fig. 2.



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Fig. 5. Drawn full size.

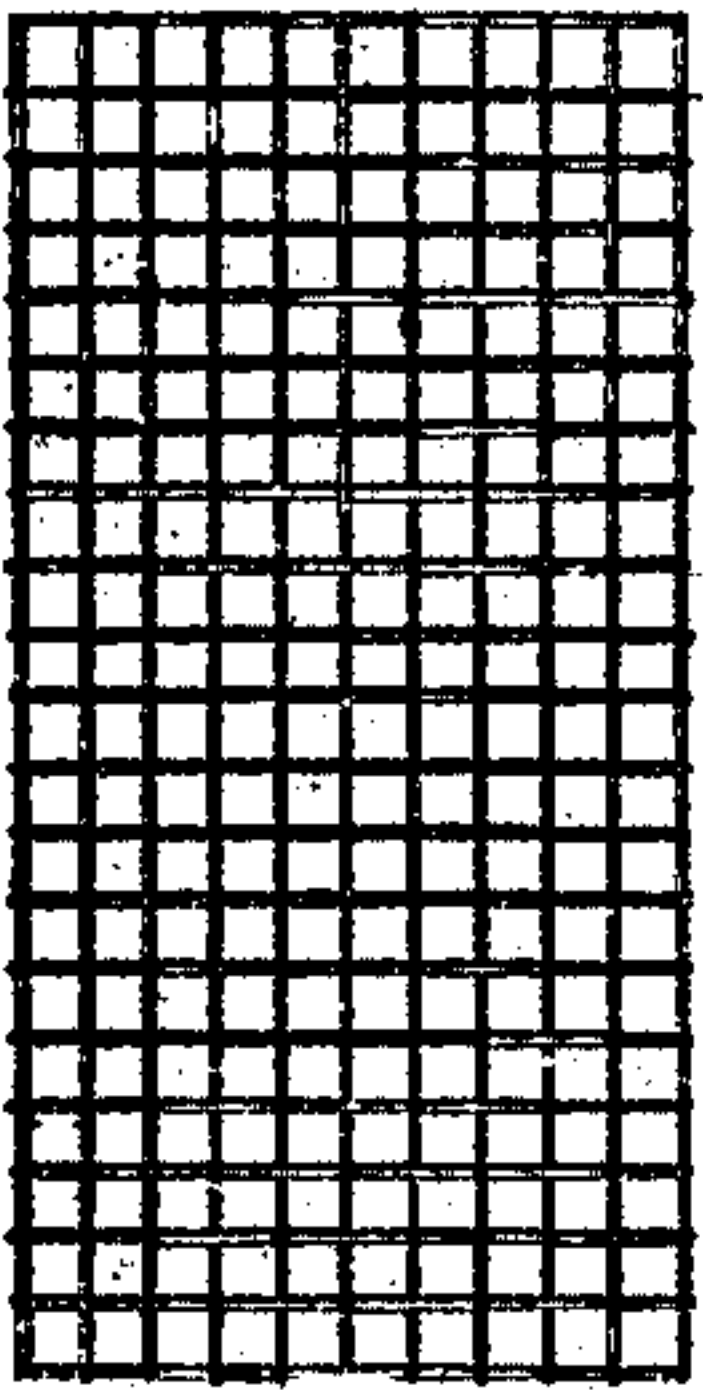


Fig. 3. Scale 1/4 in. to the foot.

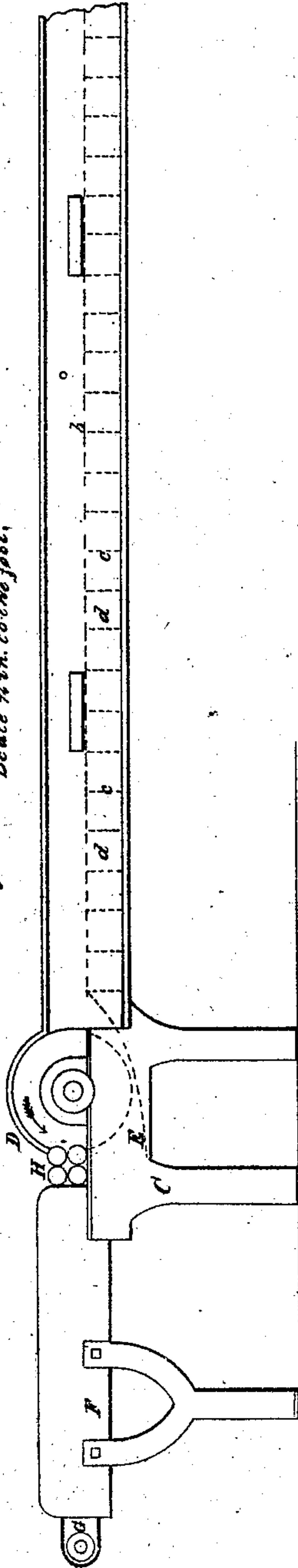
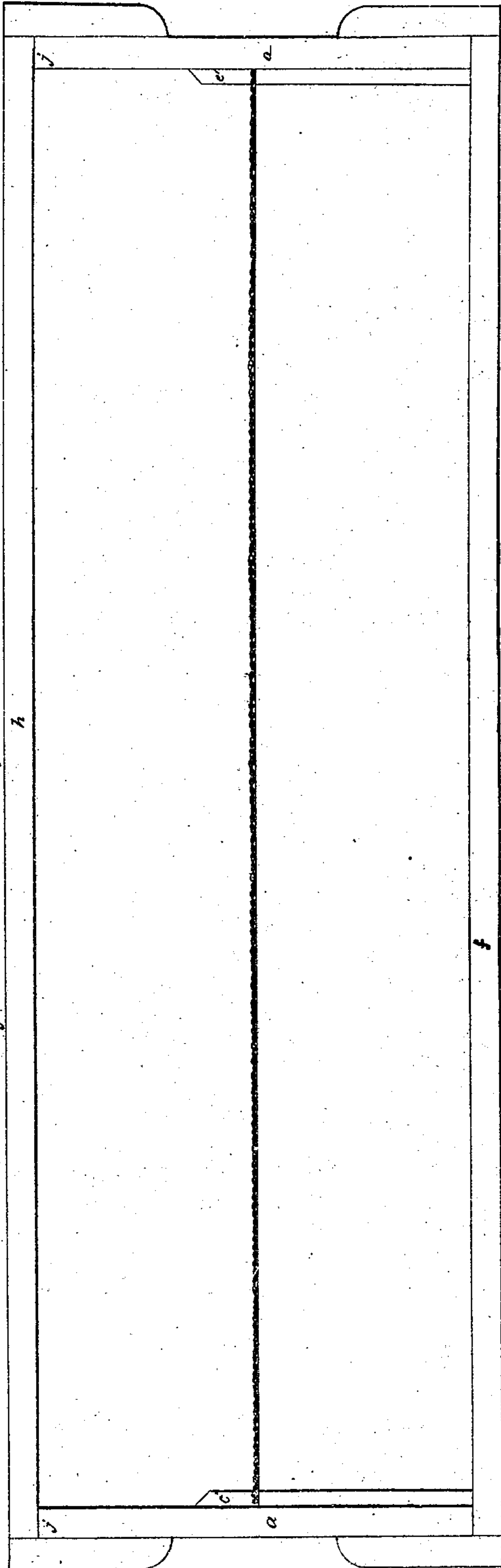


Fig. 4. Scale 6 in. to the foot.



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UNITED STATES PATENT OFFICE.

ISAAC HAYDEN, OF LAWRENCE, MASSACHUSETTS.

COTTON-CLEANER.

Specification of Letters Patent No. 29,971, dated September 11, 1860.

To all whom it may concern:

Be it known that I, ISAAC HAYDEN, of Lawrence, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Apparatus or Machinery for Cleaning Cotton and other Fibrous Substances; and I do hereby declare that the same is described and represented in the following specification and drawings.

In describing my improvements in machinery or apparatus for cleaning cotton and other substances, I propose first to state briefly what was used previous to the date of my invention, (to wit.) Machines have long been in use for cleaning and opening cotton, consisting of an endless band carried by two rotating cylinders, and arranged to supply the cotton to a pair of fluted rollers, which rollers feed the cotton to a beater or scutcher made to turn with great velocity to open the cotton and blow it into a trunk about three feet wide and one foot deep, and from twenty to sixty, or one hundred feet in length, which trunk was divided near the middle horizontally by a grate of wooden bars placed crosswise, which bars were about three quarters of an inch in diameter, with spaces between them about one fourth of an inch in width. The cotton being blown over this grating as it is opened by the scutcher, by the blast of the scutcher, and to check the blast under the grating there were vertical partitions placed crosswise about four feet apart. This grating was found very defective, for the following reasons (to-wit:) The spaces between the bars being about three feet long and one fourth of an inch wide, the long staple of the cotton passed between the bars, with the short, in locks of considerable size, so that much good cotton passed through the bars as waste, and a still greater defect was, the partitions under the bars of grating were so far apart that the blast under the grating was so near, as strong as it was above the grate that nearly all the fine sand and dirt and dust and refuse matter that passed down through the grate, was carried up through it back again and so carried forward out of the trunk, with the cotton, and although the cotton was opened and the fine sand, dust, dirt, and refuse matter were released, so as to be readily separated from the cotton, this grating of wooden bars failed to effect the separation, as the sand, dust, dirt, and refuse matter did

not remain in the trunk in any considerable quantity, but were carried out by the blast with the cotton. As this grate of bars failed almost entirely to separate the sand, dirt, dust, and refuse matter from the cotton, perforated metal plate was tried as a substitute—that is, sheet zinc was perforated with holes about one half an inch wide and about two inches long, with partitions placed vertically crosswise under the perforated zinc, about four feet apart. This proved no better than the grate of wooden bars; besides the area of the surface occupied by the wooden bars and zinc plate was three times as large as the perforations or openings in the grate, which was one cause of the failure of these devices. Another cause was the openings were too large—that is they were much longer than the length of the staple of cotton, and the third cause of its failure was, the partitions were so far apart that they did not arrest the current of air or blast of air under the grate or perforated metal, so as to retain the sand, dirt, dust and refuse matter that passed down, so as to prevent it from being carried up back again, and out of the trunk with the cotton.

The object and design of my improvement is to remedy the defects above mentioned and pointed out, by using instead of the wooden bars or perforated metal plate a reticulated screen of woven wire, or twine, with meshes so small that the staple or fiber of cotton long enough to be of any value in making yarn will reach across two of said meshes or openings, and therefore remain above the screen, while that portion or some of that portion of the fiber which is too short to reach across two of the meshes, or openings, falls through the screen with the fine sand, dirt, dust, and refuse matter heavier than the cotton. And to break the blast, or current of air under the screen so effectually that it will not carry much of the fine sand, dirt, dust, and short fiber up back again through the screen, so as to be carried out of the trunk with the cotton, I place the vertical partitions across the trunk under the screen so near together as to stop or prevent any, or sufficient blast or current under the screen, to bring much of the matter up back through the screen again; but retain what passes through the screen, or most of it, in the small cells formed under the screen by placing the partitions but a little distance apart. Another very impor-

tant advantage gained by the use of the wire screen is, that the wire occupies less than one fourth of the area of the space covered by the screen; therefore it leaves more than
 5 three fourths of the area in open meshes, or spaces between the wires, so that the dirt, dust, and refuse matter have three times as much area or open space in the screen of woven wire to fall through and be separated
 10 from the cotton, as they had when blown over the grate of wooden bars, or the perforated zinc plate; consequently there is as much dirt, dust, etc., separated or screened from the cotton in passing one foot over the
 15 screen, as there would be in passing over four feet of the grate of bars, or perforated zinc.

The nature of my invention and improvements in machinery or apparatus for cleaning cotton, and other substances, consists in dividing the trunks used for that purpose, centrally and horizontally by a reticulated screen of woven wire, or twine with cells or compartments under said screen formed so
 20 small, by vertical partitions placed cross-wise of the trunk, so near together as to break the blast or current of air, or so far prevent any current, or blast from being formed under said screen, that will carry
 25 much of the dust, dirt, or refuse matter which falls through the screen, up back again through said screen, but retain such dirt, dust and refuse matter in the cells under the screen, until it is removed by
 30 opening the bottom of the trunk.

To enable others skilled in the art of making and using machinery for working cotton and other fibrous substances, I will proceed to describe the construction and operation of the improvements which I have
 40 invented, referring to the accompanying drawings, in which the same letters of reference indicate like parts in each of the figures.

Figure 1 is a plan or top view of a trunk with my improvements; the top of the trunk is omitted to show the screen. Fig. 2 is a sectional elevation through the line A, B, of Fig. 1, with the top shown in place. Fig.
 50 3 is an elevation of a machine, such as is in common use for picking cotton, drawn on a scale of $\frac{3}{4}$ of an inch to the foot. Fig. 4 is a cross section of a trunk with the wire screen, on a scale of six inches to the foot.
 55 Fig. 5 is a portion of a screen, drawn full size.

In the above mentioned drawings, a strong frame is represented at C, provided with a beater or scutcher arranged to turn in proper
 60 boxes mounted on the frame C, which beater is covered by a semicircular case D, on the top, the ends of which case may have openings near the centers to admit air to the beater; there is a case under the beater as
 65 shown by the dotted line E, extending to the

end of the trunk which conveys the cotton away from the machine.

To supply the cotton to the beater the frame F, is connected to the frame C, as shown in the drawing, and provided with
 70 two cylindrical rollers, one of which is shown at G, which rollers carry an endless band or apron on which the cotton is spread, and as the top of the apron moves forward toward the rollers H, these rollers take it between
 75 them as they are rotated, and deliver it to the beater which knocks or beats it in small locks, as the beater is turned rapidly in the direction indicated by the arrow, and blows or delivers the locks of cotton into the trunk
 80 attached to the rear of the machine.

There is an open space between the rollers H, and the end of the bottom case E, through which space the heavy seeds are knocked, when struck by the beater and separated
 85 from the cotton; and the air also rushes or is drawn in through this open space, and is blown or forced by the beater through the trunk, carrying the cotton with it. The beater may be turned by a pulley and band,
 90 and the rollers G and H by gearing; and float boards may be applied to the arms of the beater to increase the blast through the trunk if necessary.

As the feeding apron, rollers and beater,
 95 are all well known, and have long been used, a further description is deemed unnecessary.

I will now proceed to describe the trunk connected to the rear of the machine, with
 100 my improvements. This trunk consists of two sides, *a, a*, which may be placed about thirty inches apart, and connected together by partitions, *c, c*, placed about five inches apart and made to extend from the lower
 105 edge of the sides up to the middle. The bottom of this trunk is closed by small doors *f, f*, held in place by the buttons *g, g*, so that the partitions with their bottoms form a series of small cells or compartments *d, d*,
 110 in the lower half of the trunk, which cells are covered by a screen *b*, of woven wire or twine, extending across the trunk from side to side, and supported by the tops of the partitions *c, c*. The screen *b* may be secured
 115 to the sides *a, a*, by cleats *e', e'*, so as to hold it in place on the tops of the partitions. The upper edges of the sides *a, a*, are provided with a rabbet *j, j*, to receive the edges of the top *h, h*, which may be made in sections, so
 120 as to be easily and readily removed and replaced and it is held down by the buttons, *i, i*. If it is desirable to agitate the blast of air which carries the cotton through the trunk, some deflecting cleats *e e* may be fastened alternately on the top of the screen
 125 over the partitions and to the under side of the top, as shown in the drawings. I have found in practice that these trunks work well when the height of the space above the
 130

screen was six inches, and the cells six inches deep under the screen, and that wire about number twenty, woven so as to make about twenty-five, or thirty meshes or openings in a square inch of surface. These screens should be made of smooth wire, and to prevent the fibers of cotton or other substances from catching and hanging in the scores in the woven wire, formed by the weft crossing the warp, or at the junction of the warp and weft, I fill them with varnish, made by dissolving gum-shellac in alcohol and applying it with a brush upon one, or both sides of the woven wire if only one side the top is varnished. The wire should be placed in a horizontal position when it is varnished, and allowed to remain in that position until it is dry. It should be brushed crosswise in applying the first coat of varnish, and when that is dry, the second coat should be applied by brushing it lengthwise, so as to fill the scores in each direction. I contemplate that there are some other kinds of varnish that will answer the purpose to fill the scores, and prevent the cotton, or substance blown over the screen from catching, and hanging in the scores above mentioned. The rear end of the trunk may be arranged to deliver the cotton into a room provided with screens to retain the cotton and let the air escape; or it may be so arranged as to deliver the cotton to a rotary screen to form a lap if preferred.

In carding, drawing, roving, and spinning most cotton, there is a great deal of staple so short that it flies off, or falls from the longer staple in the processes mentioned, so that it has to be frequently gathered up, or wiped from the machinery, to prevent it from obstructing the proper operation of the machinery. Now I have found that in blowing cotton through the trunk over the woven screen, a large portion of the fiber that is too short to reach across two of the meshes falls through the screen and remains below it to be removed with the waste, while the fiber that is long enough to reach across more than two meshes is blown through the trunk over the screen. This shows that my improvements effect what has never been done before, nor ever attempted that I know of—that is a separation of the short fibers of cotton from the long before carding the cotton, which is a great advantage as it saves a great deal of labor in the subsequent processes which would otherwise be required to gather up the short fiber when it is thrown or falls

off, so as to prevent it from accumulating and gathering on the machinery, and from being drawn into the work, so as to derange it. Besides the woven screen separates so much more of the fine dust and dirt from the cotton, that there is far less in the carding room than there would be if the wooden rods or perforated zinc were used, and further since the wire screen has been in use it is found that it separates so much more of the dirt and sand from the cotton than any thing previously used, that the cards will run nearly twice as long without grinding as they did before, and that fully one third of the labor of grinding the cards is saved, with the expense of grinding materials, and also one third of the wear and tear of the card clothing. Lastly goods made from cotton cleaned with the improved screen and cells present an appearance so much superior to others as to increase their value from five to eight per cent., and at the same time the cotton is worked with far less loss in waste than heretofore so that it enables the manufacturer to make goods of a given quality out of a far cheaper and inferior quality of raw material than he could do without my improvements.

I believe I have described and represented the improvements in machinery or apparatus for cleaning cotton and other substances, which I have invented, so as to enable any person skilled in making and working cotton machinery, to make, use and operate said improvements.

I will now state what I desire to secure by Letters Patents.

What I claim as my invention and improvement is—

In a trunk for cleaning cotton and other substances, dividing it horizontally or centrally with a screen of woven wire or twine, with cells or compartments under said screen so small as to prevent or break the current of air under said screen substantially as described, in combination with a machine, substantially such as is described in this specification, or its equivalent, for opening the cotton and blowing it through said trunk, over the screen substantially as described.

ISAAC HAYDEN.

Witnesses:

JOSEPH GAVETT,
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