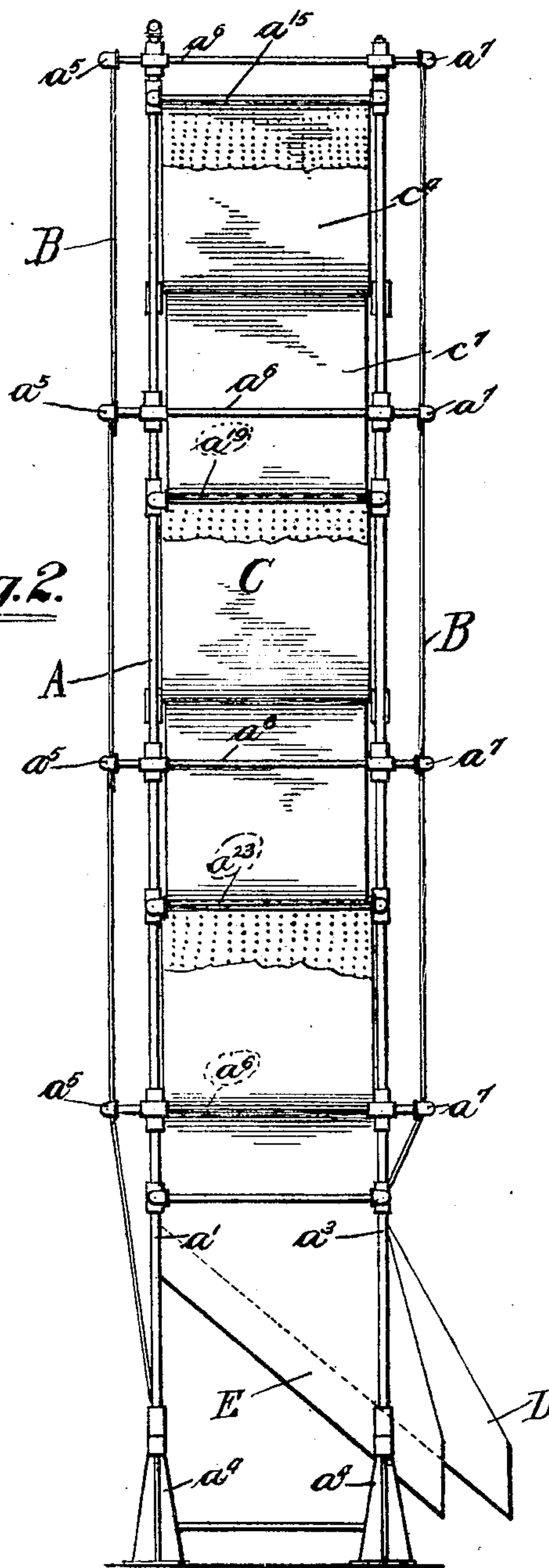
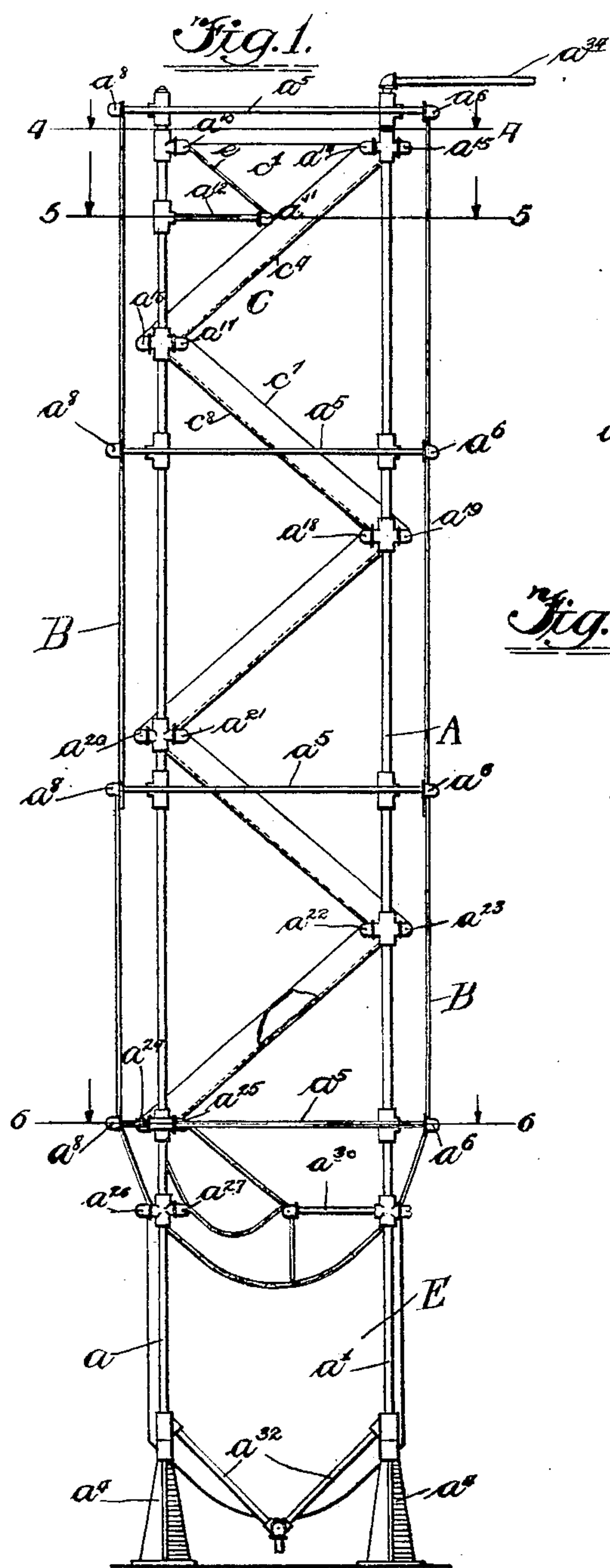


J. J. GLEDHILL.

APPARATUS FOR SCREENING AND DRYING MATERIALS.

APPLICATION FILED APR. 20, 1903.

4 SHEETS—SHEET 1.



Witnesses:

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Edward H. Kempfield

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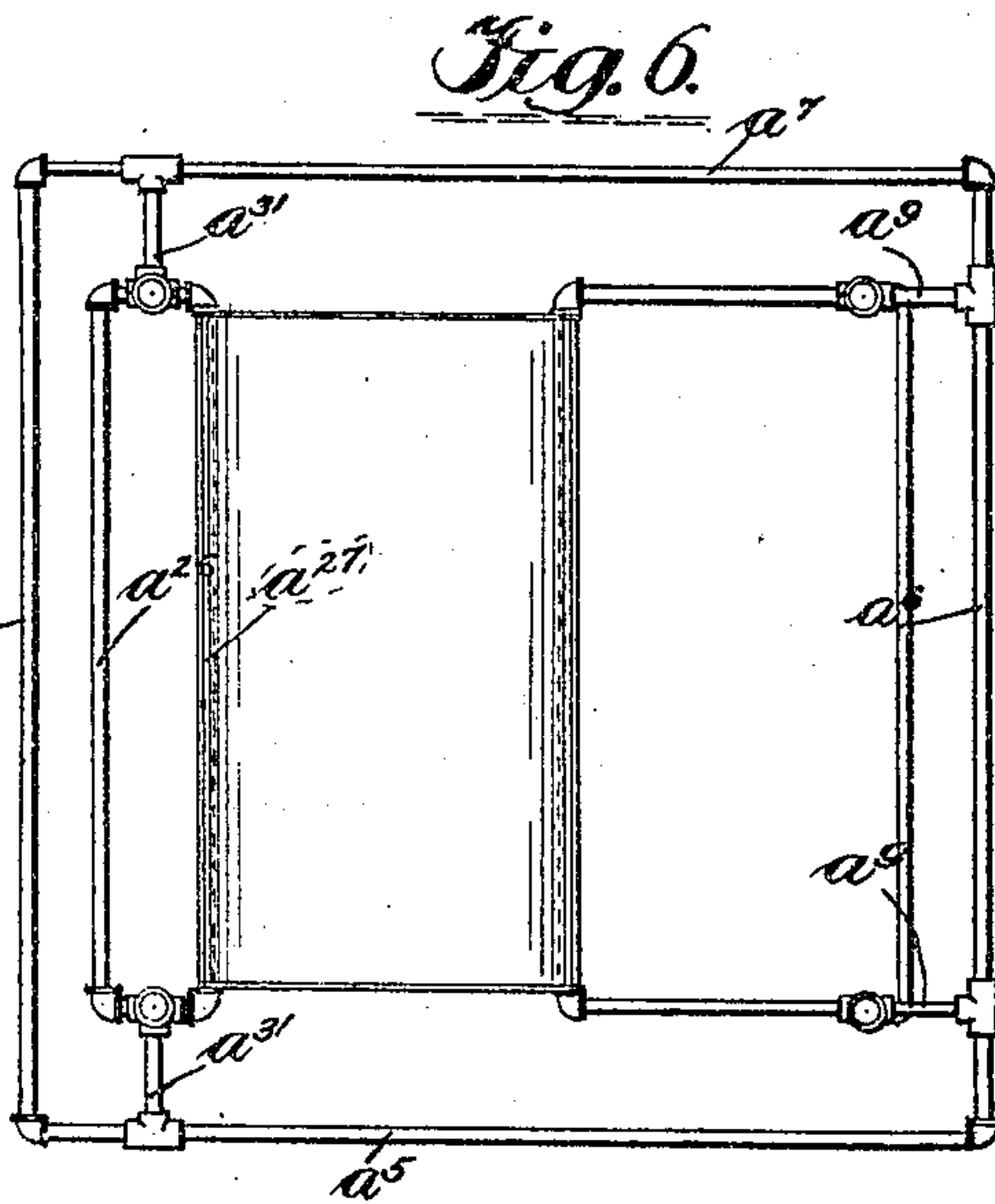
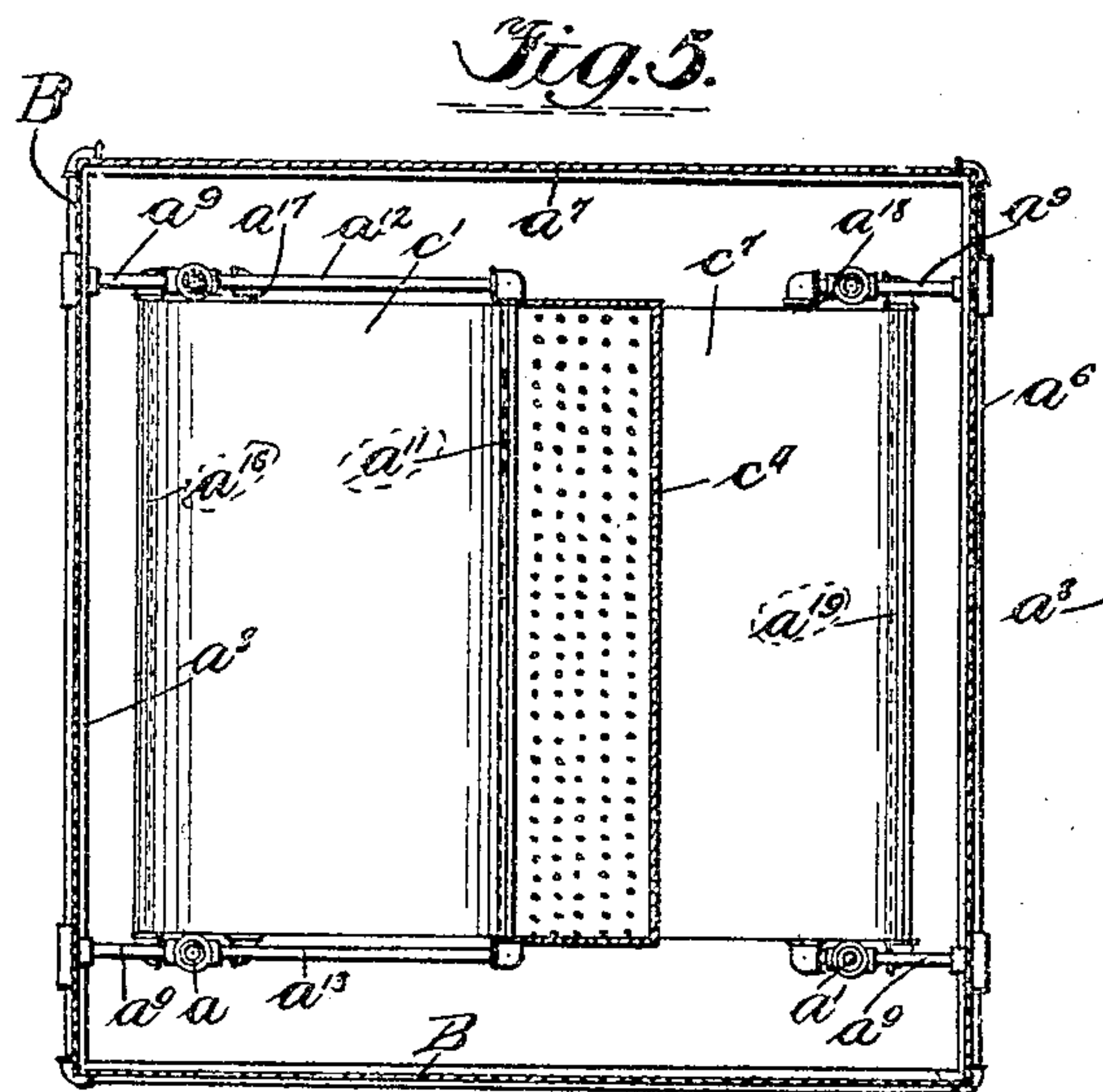
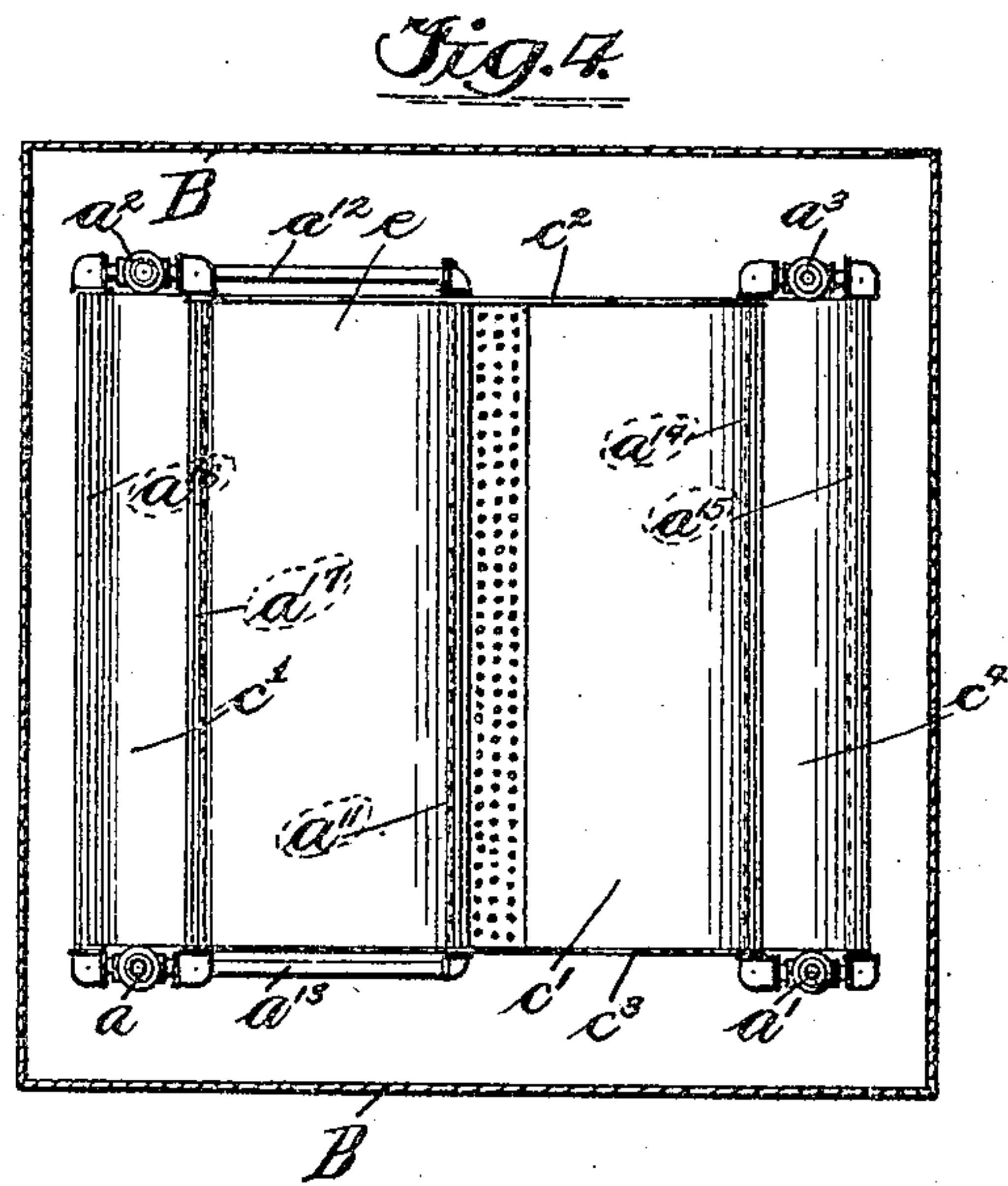
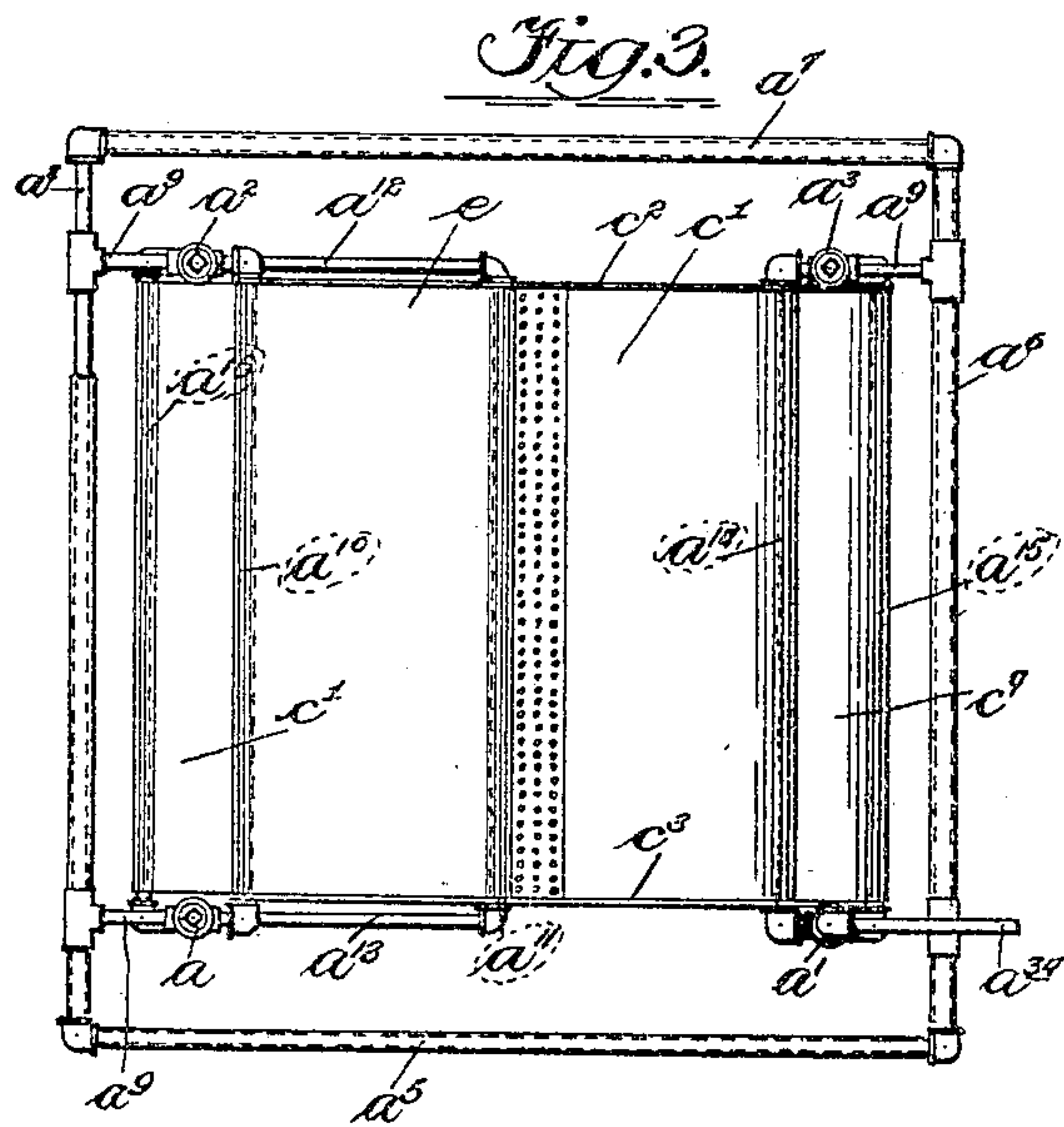
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APPARATUS FOR SCREENING AND DRYING MATERIALS.

APPLICATION FILED APR. 20, 1903.

4 SHEETS—SHEET 2.



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No. 795,349.

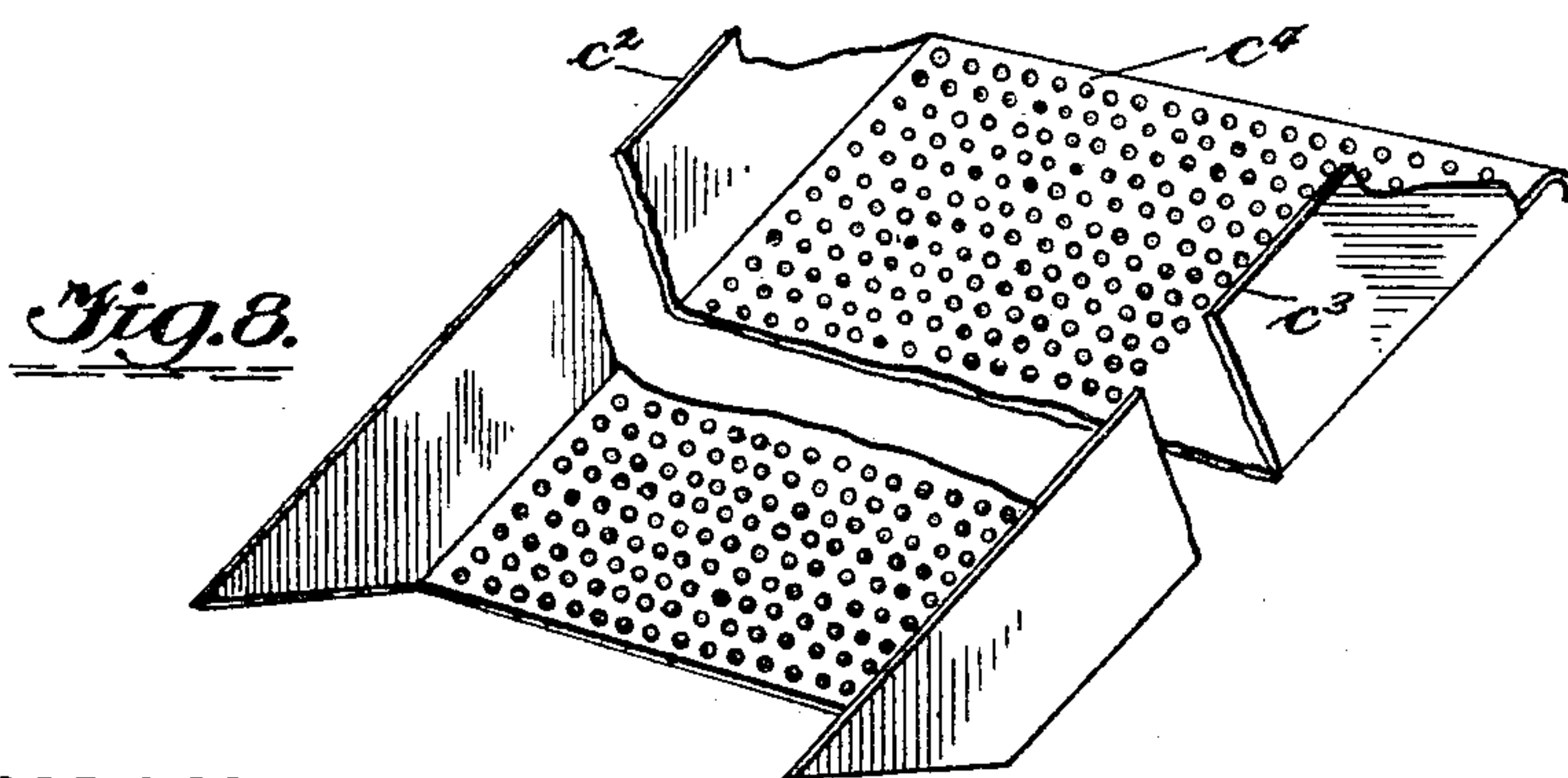
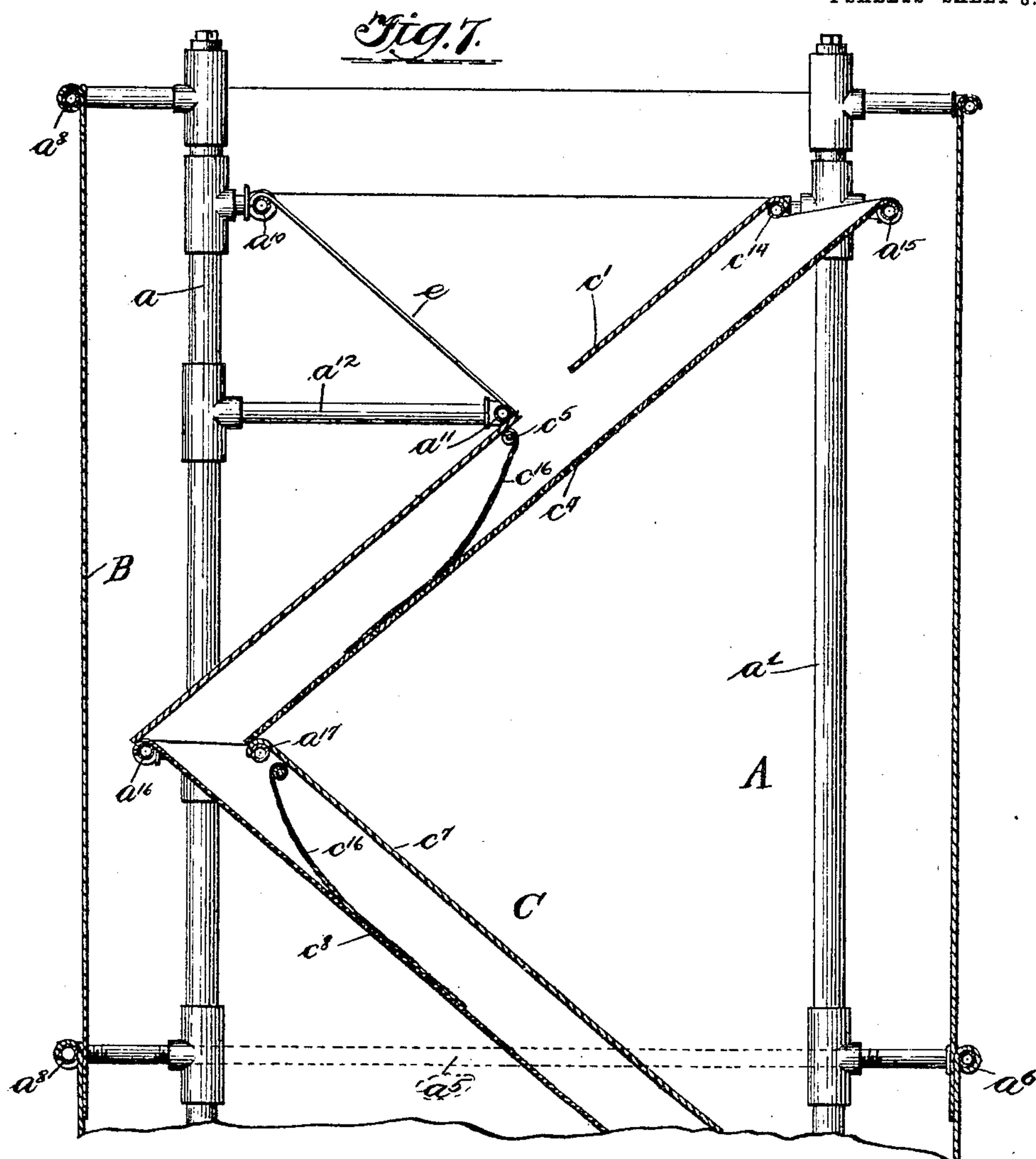
PATENTED JULY 25, 1905.

J. J. GLEDHILL.

APPARATUS FOR SCREENING AND DRYING MATERIALS.

APPLICATION FILED APR. 20, 1903.

4 SHEETS—SHEET 3.



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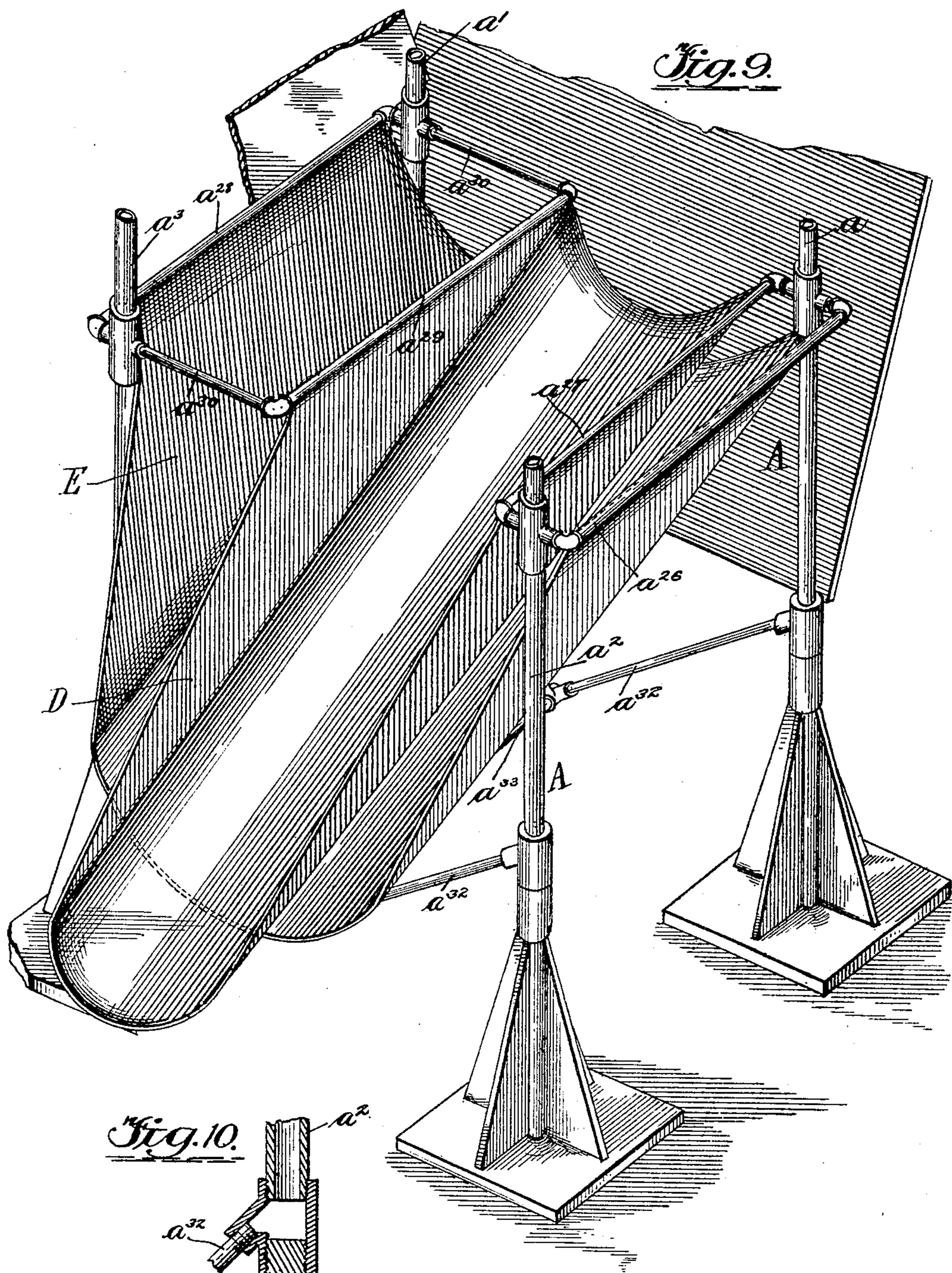
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APPARATUS FOR SCREENING AND DRYING MATERIALS.

APPLICATION FILED APR. 20, 1903.

4 SHEETS—SHEET 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN J. GLEDHILL, OF CHICAGO, ILLINOIS.

APPARATUS FOR SCREENING AND DRYING MATERIALS.

No. 795,349.

Specification of Letters Patent.

Patented July 25, 1905.

Application filed April 20, 1903. Serial No. 153,571.

To all whom it may concern:

Be it known that I, JOHN J. GLEDHILL, a citizen of the United States of America, and a resident of Chicago, Cook county, Illinois, have invented a certain new and useful Improvement in Apparatus for Screening and Drying Materials, of which the following is a specification.

My invention relates to apparatus for screening and drying various materials—such, for example, as clay, sand, cement, or even wheat and other like grains.

Generally stated, the object of my invention is the provision of a simple, efficient, and compact apparatus of the foregoing character.

A special object is to provide a strong and simple framework which may be utilized also as a system for the distribution of steam throughout the apparatus for the purpose of heating the materials.

Another object is to provide an improved construction and arrangement for separating the relatively fine material from the relatively large material and for effectively disposing of the same after the separation has been effected.

It is also an object to provide certain details and features of improvement tending to increase the general efficiency of an apparatus of this particular character.

To the foregoing and other useful ends my invention consists in matters hereinafter set forth and claimed.

In the accompanying drawings, Figure 1 is a rear elevation of a combined screening and drying apparatus embodying the principles of my invention, the sheet-metal casing being shown in section, so as to bring the interior parts into view. Fig. 2 is a view similar to Fig. 1, but showing the side of the apparatus rather than the rear. Fig. 3 is a plan of the apparatus shown in Fig. 1. Fig. 4 is a horizontal cross-section on line 4 4 in Fig. 1. Fig. 5 is a horizontal cross-section on line 5 5 in Fig. 1. Fig. 6 is a horizontal cross-section on line 6 6 in Fig. 1. Fig. 7 is an enlarged vertical section of the upper portion of the apparatus shown in Fig. 1. Fig. 8 is a perspective of one of the trough-like screens, the middle portion being broken away for convenience of illustration. Fig. 9 is a perspective of the base or lower end of the apparatus shown in Figs. 1 and 2. Fig. 10 is a detail vertical section of the lower portion of one of the standards or corner-posts of the apparatus shown in Figs. 1 and 2.

As thus illustrated and as thus embodied in practical form, my invention comprises an upright frame or body structure A, and a casing or inclosure B. The said frame or body structure is preferably composed of tubing and is therefore adapted to serve as a combined framework and steam-heating system. Preferably this combined framework and heating system comprises four uprights or vertically-arranged pipes a , a' , a^2 , and a^3 , each having its lower end mounted in a suitable base or pedestal a^4 . The standards or corner-posts thus provided can be of any desired height and are preferably connected at intervals by means of horizontal tubing arranged as shown in the drawings. This horizontal tubing can be of any suitable character and can be arranged in any suitable manner, but preferably consists in each case of four pieces of pipe a^5 , a^6 , a^7 , and a^8 , all connected in the form of a rectangle or square, and the pipes a^5 and a^8 being connected with the vertical or upright pipes by means of branch pipes a^9 . At the upper portion of the framework the pipes a and a^2 are also connected by means of the pipe a^{10} and immediately below this point by the pipes a^{11} , a^{12} , and a^{13} . At the other side the pipes a' and a^3 are connected by a pair of parallel pipes a^{14} and a^{15} . Farther down on the other side the pipes a and a^2 are again connected by a pair of parallel pipes a^{16} and a^{17} . Also down and at the other side the pipes a' and a^3 are connected by a pair of parallel pipes a^{18} and a^{19} . Below this point and at the other side the pipes a and a^2 are connected by a pair of parallel pipes a^{20} and a^{21} . Farther down and at the other side the pipes a' and a^3 are connected by a pair of parallel pipes a^{22} and a^{23} . Somewhat lower down the pipes a and a^2 are again connected by a pair of parallel pipes a^{24} and a^{25} and just below this point by a pair of pipes a^{26} and a^{27} . Opposite these last-mentioned pipes and at the other side the pipes a' and a^3 are connected by the pipes a^{28} and a^{29} and by the end pipes a^{30} . Communication between the pipes a^{26} and a^{27} and the outside pipes a^5 and a^7 at this point is afforded through the small branch pipes a^{31} . At the bottom of the framework thus constructed wholly of tubing the four standards are connected by the small branch pipes a^{32} and a^{33} . The pipe a^{34} at the top of the structure serves as the inlet for the steam, while the pipe a^{35} at the bottom serves as a drip or outlet for condensed steam and water. It will be observed that these different lengths

of tubing are all suitably connected by appropriate coupling devices.

In order to obtain an efficient screening and drying action, the screening device C preferably comprises a number of inclined chutes or troughs having perforated bottom walls, these chutes or troughs being arranged end to end, so as to form a practically continuous drying and screening channel or passage from the top to the bottom of the structure. Also to get an efficient screening and drying action these chutes or troughs are given an angular arrangement, each one being practically at right angles to the adjacent chutes or troughs, so that the materials supplied at the top of the channel or passage are forced to traverse a zigzag or back-and-forth path while descending. For example, the hopper for the reception of the materials at the top of the structure may consist of sheet-metal plates c and c' , both having their upper edges bent over and seated upon the pipes a^{10} and a^{14} . The sheet-metal plates c^2 and c^3 can be provided for closing the sides of the hopper thus formed. From this hopper the materials can enter the first trough or chute, which consists of the sheet-metal member c^4 . This sheet-metal portion or member c^4 is trough-like in form, as shown in Fig. 8, and has its upper end bent over and seated upon the pipe a^{15} . It will be observed that the sides of this member c^4 are of sufficient height to provide an inclosed channel or passage for materials. It will also be seen that the plate c' and the sheet-metal trough or member c^4 are of a length to extend downward and across the structure and rest at their lower ends upon the pipes a^{16} and a^{17} . The lower edges of the plate c preferably rest upon the pipe a^{11} . The perforations in the bottom wall of the sheet-metal member c^4 may vary in character according to the nature of the materials to be screened and dried, and in order to in a manner press the materials firmly against this perforated floor or bottom wall, so as to insure a better screening action, the upper end of the trough can be provided with a rod c^5 and an apron c^6 , of canvas or like material, can be hung upon this rod and allowed to rest flatwise upon the downwardly-moving material. The balance of the chutes or troughs are substantially like the one composed of the plate c' and sheet-metal member c^4 just described. For example, the next one may consist of an upper plate c^7 , having its upper edge bent over and adapted to rest upon the pipe a^{17} , and of a sheet-metal and trough-like member c^8 . As in the other case, this sheet-metal member c^8 has a perforated floor or bottom wall, and its upper edge is bent over and seated upon the pipe a^{16} . The lower end of the trough or chute thus formed can rest upon the pipes a^{18} and a^{19} at the other side of the structure. The succeeding chutes or troughs are of the same character and con-

struction, with the exception of the lowermost chute or trough, which latter is shorter than the others and adapted to rest at its lower end upon the pipes a^{27} and a^{29} . It will be understood that each chute or trough can be provided with the canvas apron already described. At its lower end the zigzag passage or channel thus formed for the downward passage of the material terminates in a relatively narrow spout or discharge-trough D. The lower end of the chamber provided by the casing B terminates practically in a relatively wide spout or discharge-trough E. With this arrangement the relatively fine portion of the materials will fall through the perforations in the floors or bottom walls of the screening troughs or chutes and will in each case then fall or slide from off the top walls of the different chutes or troughs and descend to the spout or discharge-trough E. On the other hand, the screenings or relatively coarse portion of the materials will, assuming that the apparatus is being employed for screening sand, clay, or other like materials, be received and finally discharged by the spout D. In the case of grain, however, the dirt, dust, and undesirable portions will pass through the perforations in the troughs or chutes and be received by the spout E, while the good grain will be received by the spout D; but whatever the nature of the materials it will be seen that they are forced to pass from one inclined trough or chute to another and that in so doing they are not only subjected to a sufficient screening action, but also to a thorough heating and drying action. As previously explained, the tubing of which the frame or body of the structure is composed serves as an efficient system of piping for the distribution of steam or other heated gases. In this way the steam-heating system which is provided for furnishing sufficient heat to give a proper drying action serves also as the sole means for supporting the screening devices.

The casing or inclosure B is preferably of sheet metal and is preferably composed of plates or sections which have their upper edges bent over and hung or seated upon the pipes a^5 , a^6 , a^7 , and a^8 . In this way both the casing of the structure and the troughs or screening-chutes are composed of sheet-metal sections which are hung upon the various horizontal sections of the tubing. In this way the structure as a whole is very strong and simple and involves practically a minimum number of parts and amount of material. At the same time and as a further advantage the structure is such that the apparatus can be built up to any desired height. In other words, the upright piping of the framework of steam-pipes is preferably composed of sections, and these sections may correspond in length to the sections of the metal casing or inclosure. Thus any number of sections can be employed, according to the height desired for the struc-

ture as a whole, and in addition the steam-piping, which is practically wholly inclosed within the chamber provided by the casing, serves both as the supporting medium for the entire structure and as the means for heating the chamber. In this way I provide a very simple, efficient, and economical form of apparatus.

It is obvious that the steam-pipes serve as a steam-radiator for heating the chamber provided by the inclosure.

What I claim as my invention is—

1. Apparatus for drying and screening materials, comprising an upright framework composed of a system of steam-pipes for supplying the heat, a plurality of angularly-disposed screening devices mounted on said piping, and a casing or inclosure composed of sheet-metal sections also mounted upon said piping.

2. Apparatus for screening materials, comprising a plurality of screening devices arranged one above the other and connected end to end to form a zigzag or back-and-forth channel for the downward passage of the materials, a casing inclosing said screening devices, steam-pipes constituting the sole means for supporting said screening devices and casing, said pipes being within the chamber provided by said casing, and a pair of discharge-spouts arranged one above the other, the said channel for the downward passage of the materials terminating at its lower end in the upper of said spouts, and the chamber provided by said casing terminating at its lower end in the lower of said spouts the casing being composed of separable sections removably mounted on the said pipes.

3. A screening device, comprising an inclined trough or chute having a perforated floor or bottom wall, an apron of canvas or other suitable material adapted to rest upon the materials while moving downward upon said perforated floor or bottom wall, a casing inclosing said trough, and steam-pipes constituting the sole means for supporting both the casing and the trough, said pipes being within the casing the casing being composed of separable sections removably mounted on the said pipes.

4. Apparatus for drying and screening materials comprising a vertically-disposed framework composed of steam-pipes, screening devices extending in zigzag fashion from top to bottom of said framework, and a suitable inclosure for said framework and screening devices, said inclosure consisting of sheet-metal sections hung upon the outer portions of said framework, and both the inclosure and the screening devices being supported by the steam-piping thus constituting the framework of the structure.

5. Apparatus for drying and screening materials, comprising an upright framework composed of steam-pipes, said framework comprising four vertical corner-pipes and horizon-

tal connecting-pipes, screening devices removably mounted upon certain of said horizontal pipes and extending in zigzag fashion from top to bottom of said framework, and an inclosure mounted upon said framework, said inclosure consisting of sheet-metal sections having their upper ends bent over and removably hung upon certain of said horizontal pipes, the framework thus composed of steam-pipes supporting both the screening devices and the said inclosure.

6. Apparatus for drying and screening materials, comprising a suitable upright framework provided with horizontally-disposed steam-pipes, screening devices extending in zigzag fashion from top to bottom of said framework, said screening devices having their junctures or meeting ends removably secured to said steam-pipes, and an inclosure supported by said framework and inclosing said steam-pipes and screening devices the casing being composed of separable sections removably mounted on the said pipes.

7. A screening apparatus comprising a plurality of troughs or chutes arranged one above the other and connected to provide a zigzag or back-and-forth channel for the downward passage of the materials, each trough or chute consisting of a lower sheet-metal member having sides and a perforated bottom and of a sheet-metal top, a casing inclosing said screening devices, and steam-pipes inclosed by said casing, said pipes serving both as the supporting-framework for the entire structure, and as the means for heating the chamber provided by the casing the casing being composed of separable sections removably mounted on the said pipes.

8. Apparatus for drying and screening materials, comprising an upright framework composed of a system of steam-pipes, a hopper at the top of said framework, a pair of discharge-spouts at the lower end of said framework, a series of screening devices extending in zigzag fashion from the hopper to said spouts, and a sheet-metal casing inclosing the pipes and screening devices, said piping constituting the sole means for supporting the casing and screening devices, and for heating the interior of the casing, the chamber provided by said casing terminating at its lower end in one of said discharge-spouts, and the zigzag path or channel provided by said screening devices terminating at its lower end in the other of said spouts the casing being composed of separable sections removably mounted on the said pipes.

9. Apparatus for drying and screening materials, comprising a plurality of screening devices arranged to provide a zigzag or back-and-forth and downward path for the materials, a system of steam-pipes comprising upright members for supplying the heat, and adapted also to serve as the upright supporting members of a framework for supporting

the said screening devices, and a casing for inclosing said devices supported also by said pipes, the upright pipes being inclosed, the casing being composed of separable sections removably mounted on the said framework.

10. Apparatus for drying and screening materials, comprising a plurality of screening devices arranged one above the other and connected to provide a zigzag or back-and-forth channel for the downward passage of materials, steam-pipes having horizontal sections arranged to support said screening devices at their junctions, and a casing inclosing said screening devices and steam-pipes, said pipes constituting an upright framework for supporting said casing and devices the casing being composed of separable sections removably mounted on the said pipes.

11. Apparatus for drying and screening materials, comprising suitable screening devices, a casing inclosing said screening devices, relatively wide and narrow discharge-spouts at the bottom of the casing, the wide spout communicating with the interior of the casing and the narrow spout with the screening devices, and a system of steam-pipes inclosed within and adapted for heating the chamber provided by said casing, the entire structure being supported by said pipes the casing being composed of separable sections removably mounted on the said pipes.

12. Apparatus for drying and screening materials, comprising suitable screening devices, a system of steam-pipes for supplying the heat and adapted also to serve as the supporting-framework for said screening devices, there being four upright corner pipes, and means for inclosing said devices supported also by said pipes, the upright pipes being inclosed.

13. Apparatus for drying and screening materials, comprising an upright supporting-framework of steam-pipes, said framework including four upright corner pipe members, and including also suitably-disposed horizontal pipe members connecting the said upright members at intervals, removable screening devices mounted upon certain of the said horizontal pipe members and extending in zigzag fashion from the top of the framework toward the bottom, and a removable sheet-metal casing supported on certain of said horizontal pipe members and inclosing said upright pipe members, whereby the said framework of steam-pipes serves both as the supporting medium for the entire structure and as the means for heating the inclosing chamber provided by the said casing.

14. Apparatus for drying and screening materials, comprising an upright framework of steam-pipes having four upright corner pipe members, and including also suitably-disposed horizontal connecting pipe members, the lower ends of said upright pipe members being suitably mounted for supporting the entire structure in an upright position, screening devices supported by the said framework of steam-pipes, and a casing supported by the steam-pipes and inclosing the said screening devices, whereby the framework thus constructed of steam-pipes serves both as the supporting medium for the entire structure and as the means for heating the inclosing chamber provided by said casing.

15. Apparatus for drying and screening materials, comprising a supporting-framework of steam-pipes, the said framework including upright pipe members extending upwardly in sections, screening devices supported by the framework of pipes and extending downwardly in removable sections, and a sheet-metal casing also supported by said framework of pipes and extending downwardly in sections corresponding to the sections of the upright piping.

16. Apparatus for drying and screening materials, comprising an upright supporting-framework of steam-pipes, said framework including upright pipe members extending upwardly in sections, and including also suitably-disposed horizontal connecting pipe members, a steam-inlet pipe connected with the upper end of the framework of pipes, an outlet connected with the bottom portion of the framework of piping, screening devices removably mounted in sections on the said piping, and a sheet-metal casing also removably mounted upon the piping and composed of sections corresponding to the sections of the upright piping.

17. The combination of an upright steam-radiator composed of sections arranged one on top of the other, screening means carried by the radiator and composed of sections arranged one above the other, and an inclosure also composed of sections corresponding in length to the sections of the radiator and mounted thereon, said inclosure surrounding both radiator and screening means.

Signed by me at New Orleans, Louisiana, this 15th day of April, 1902.

JOHN J. GLEDHILL.

Witnesses:

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A. E. LIVANDAIS.