

A. M. SCHREUDER.
 DRYING MACHINE.
 APPLICATION FILED AUG. 26, 1909.

962,865.

Patented June 28, 1910.

4 SHEETS—SHEET 1.

Fig. 1.

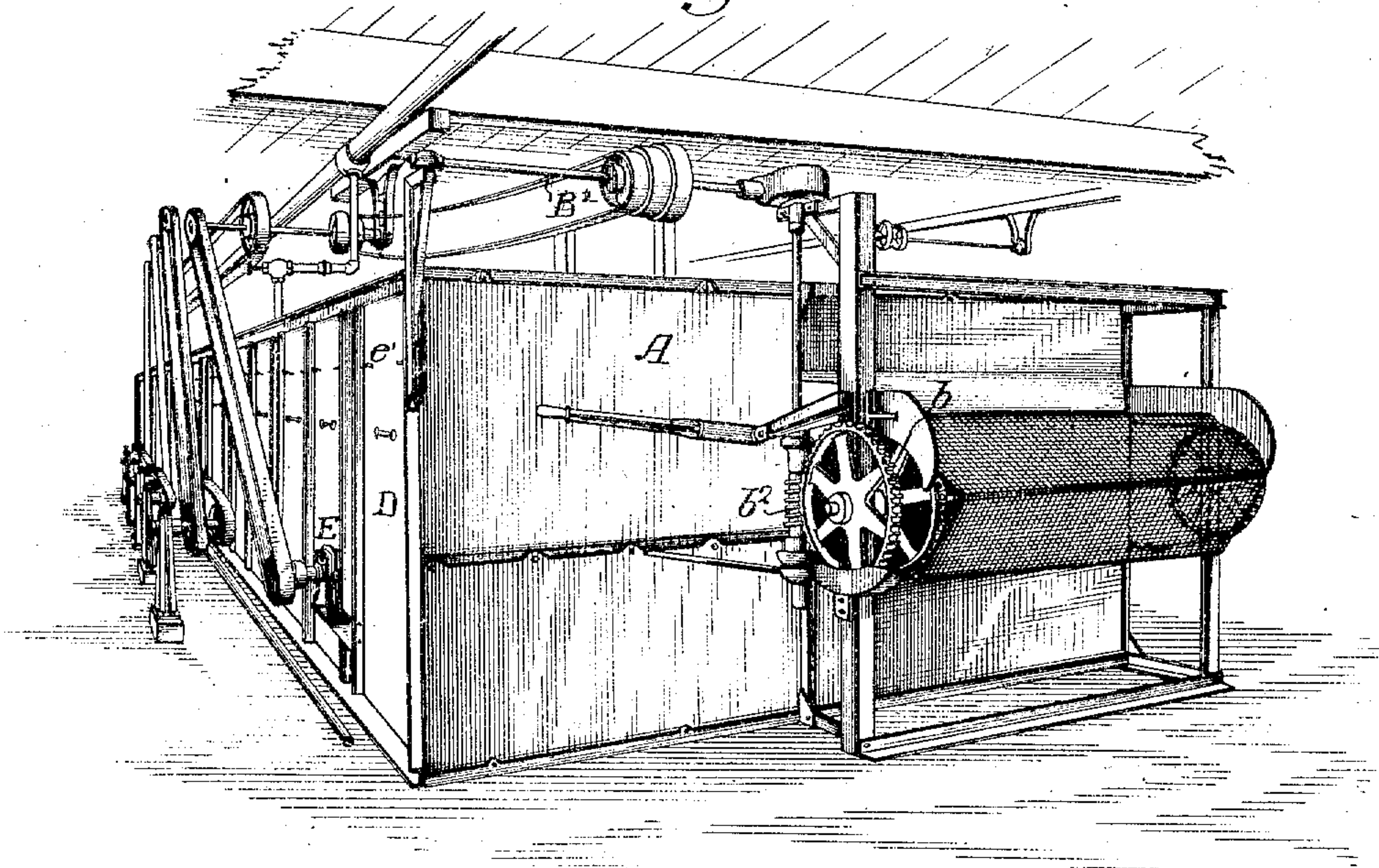


Fig. 9.

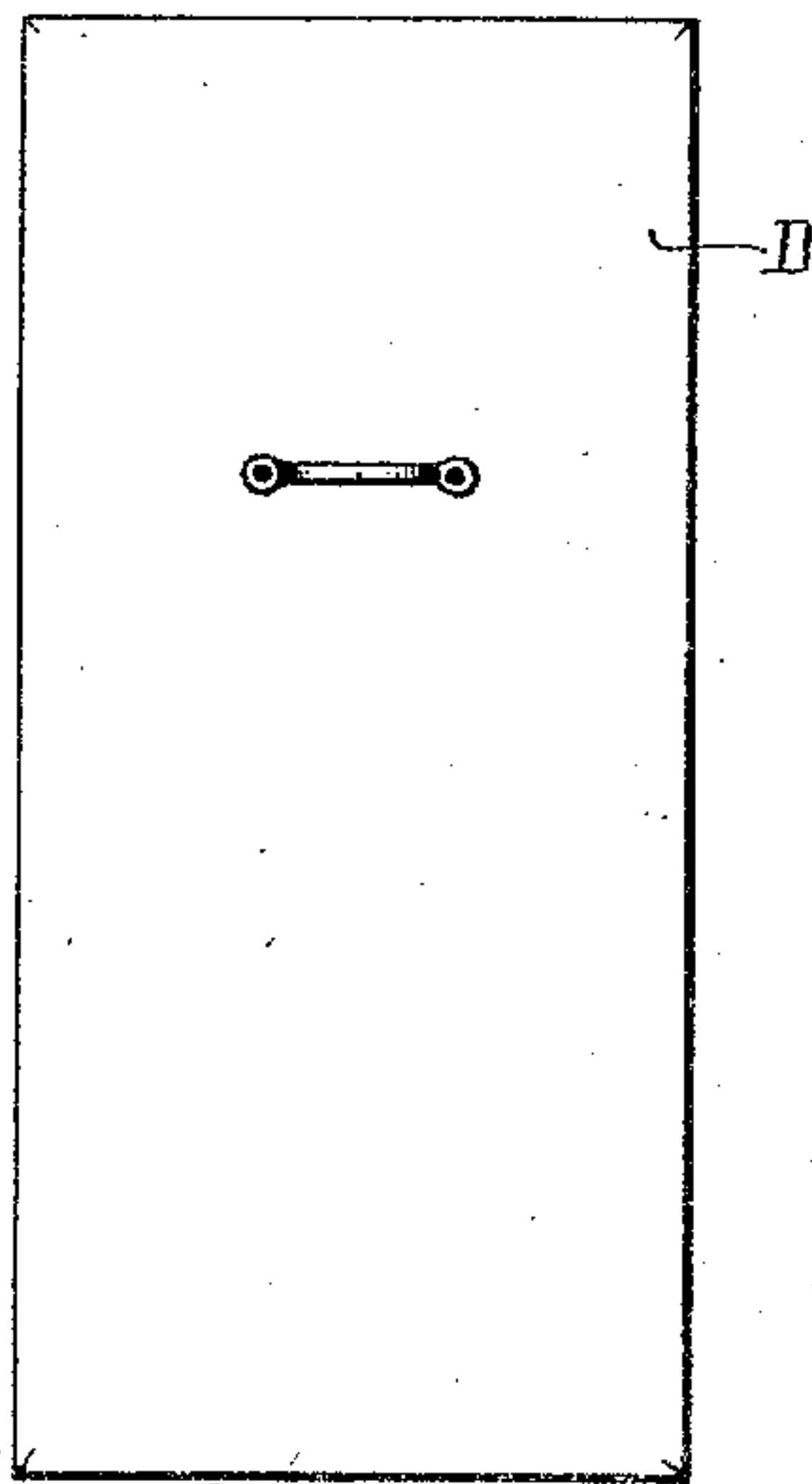
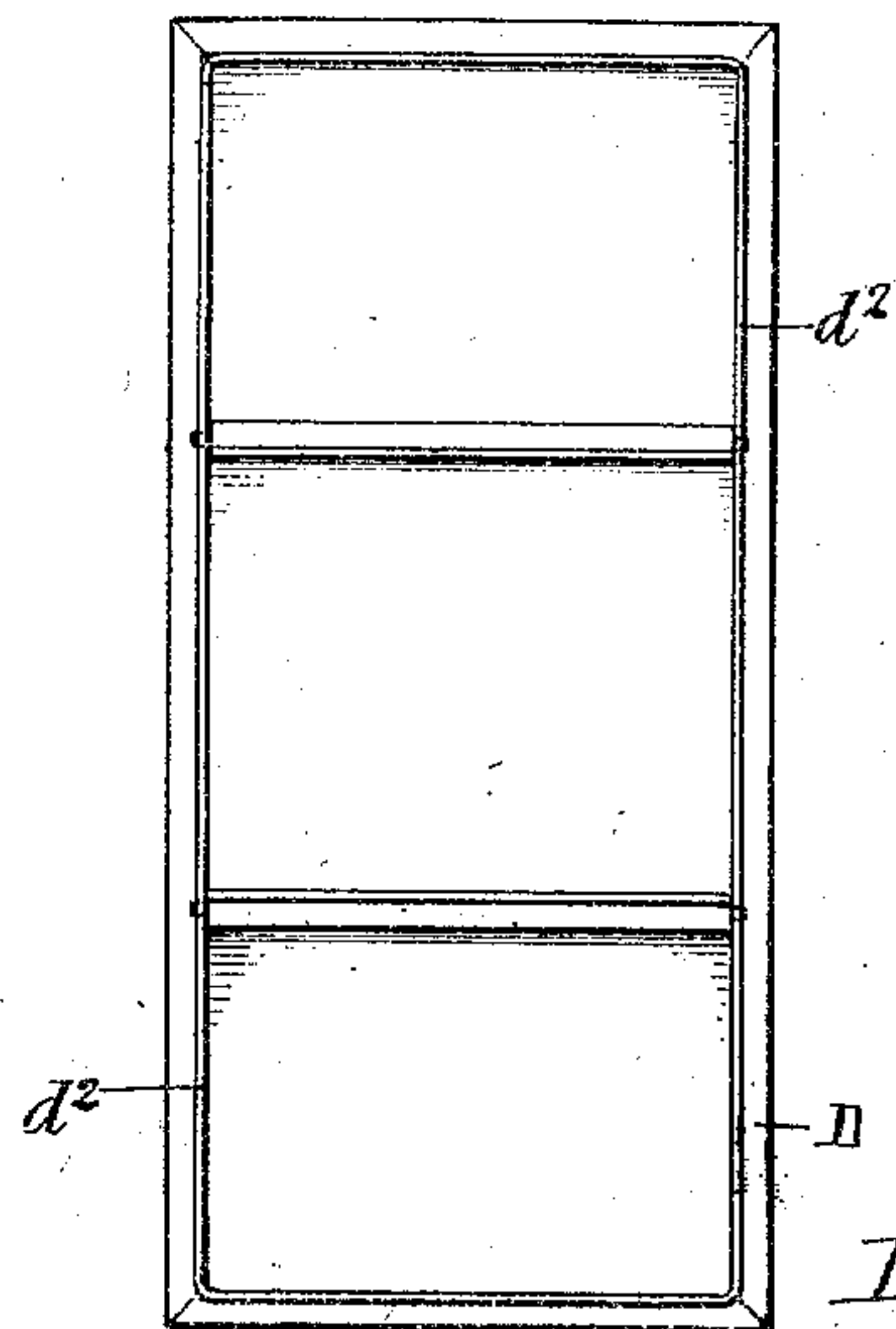


Fig. 10.



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Wills A. Bunnell

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 by his Attorneys
Horace M. Norman

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4 SHEETS—SHEET 2.

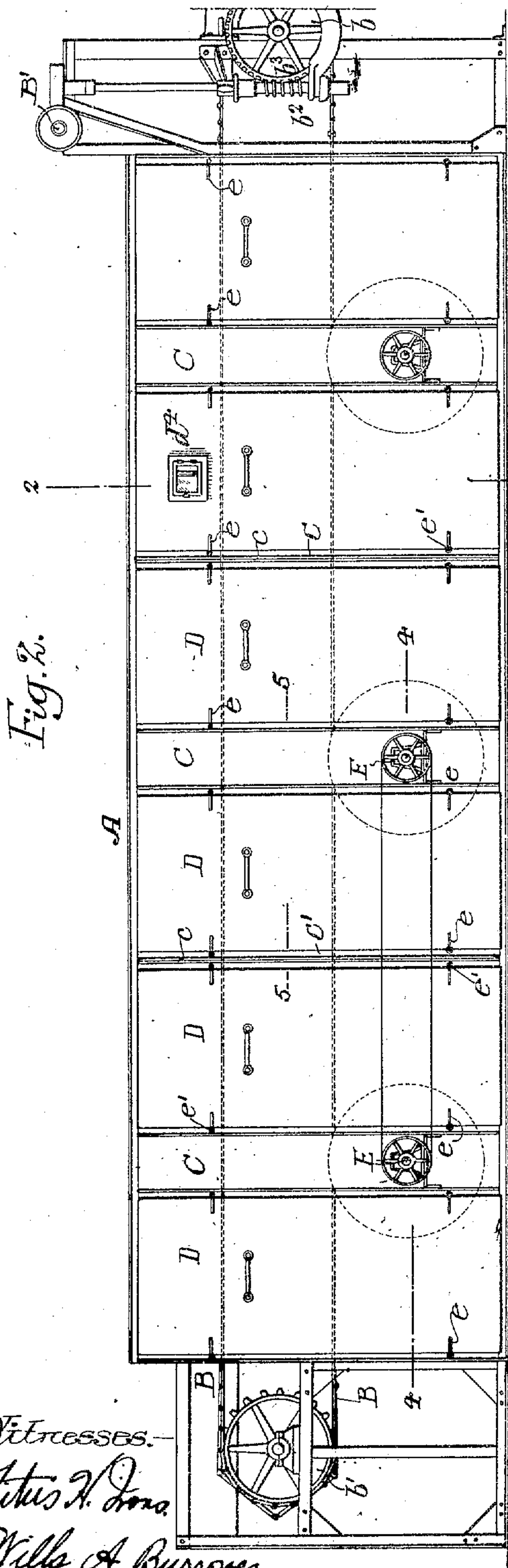


Fig. 2.

Witnesses:
 Lewis H. Jones
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Fig. 13.



Fig. 5.

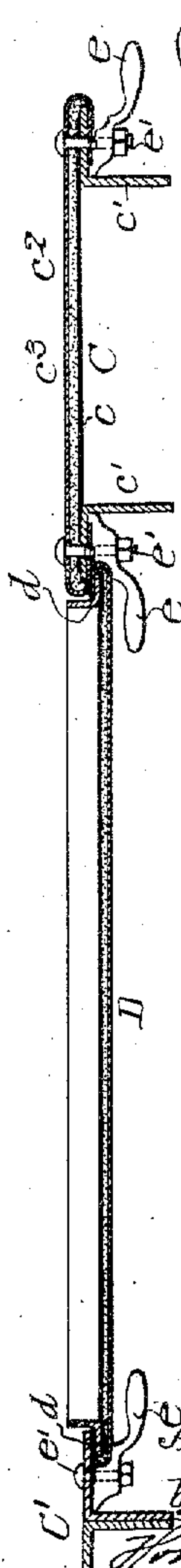


Fig. 6.

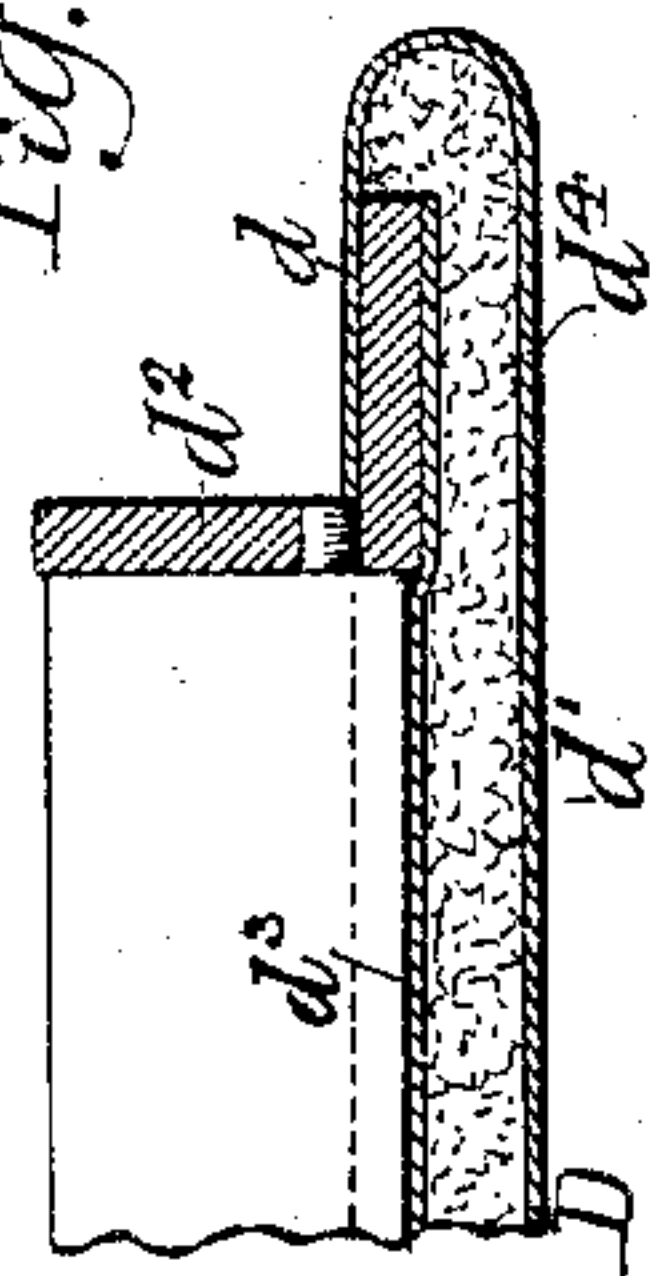


Fig. 12.

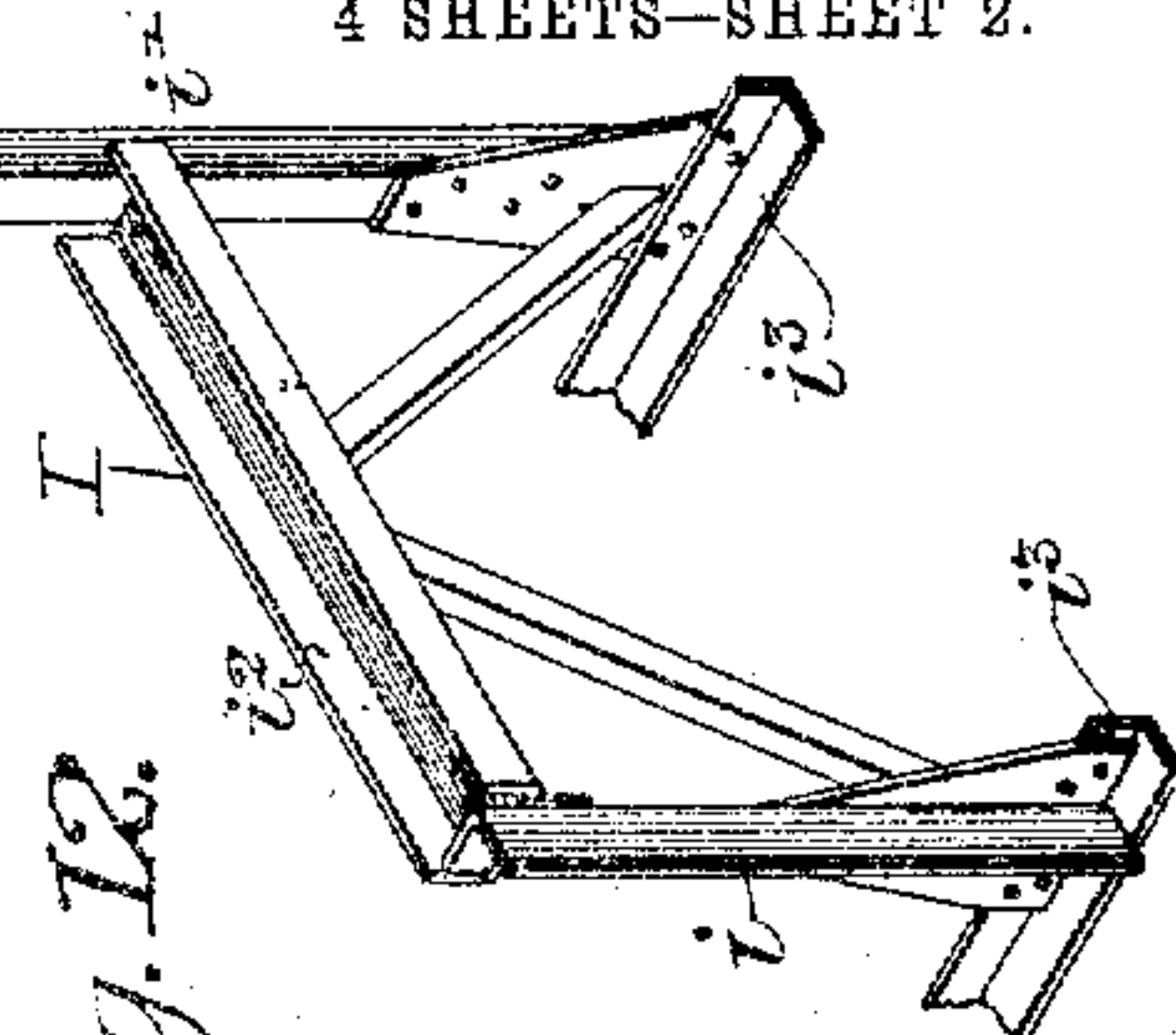
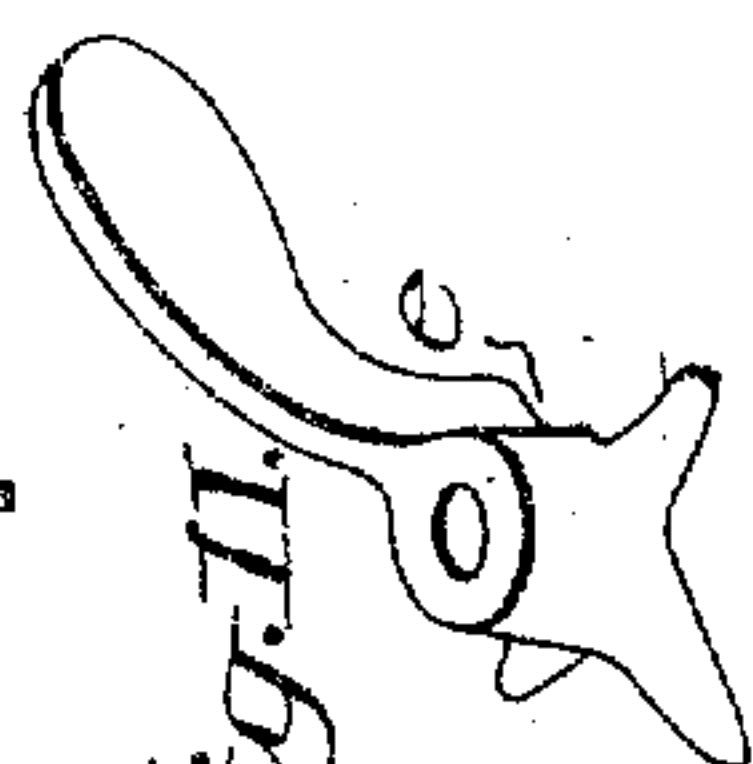


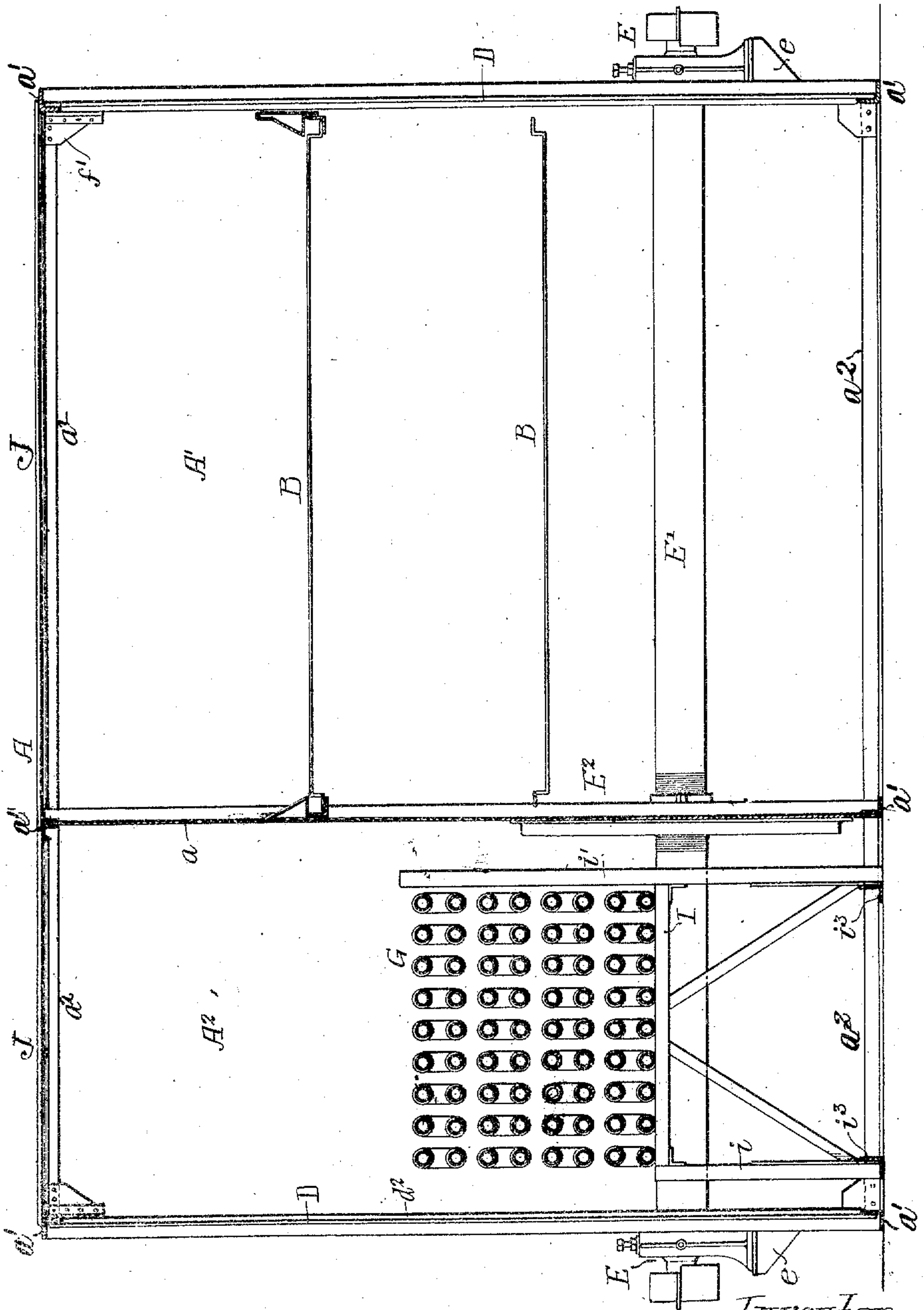
Fig. 11.



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Fig. 3.



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4 SHEETS—SHEET 4.

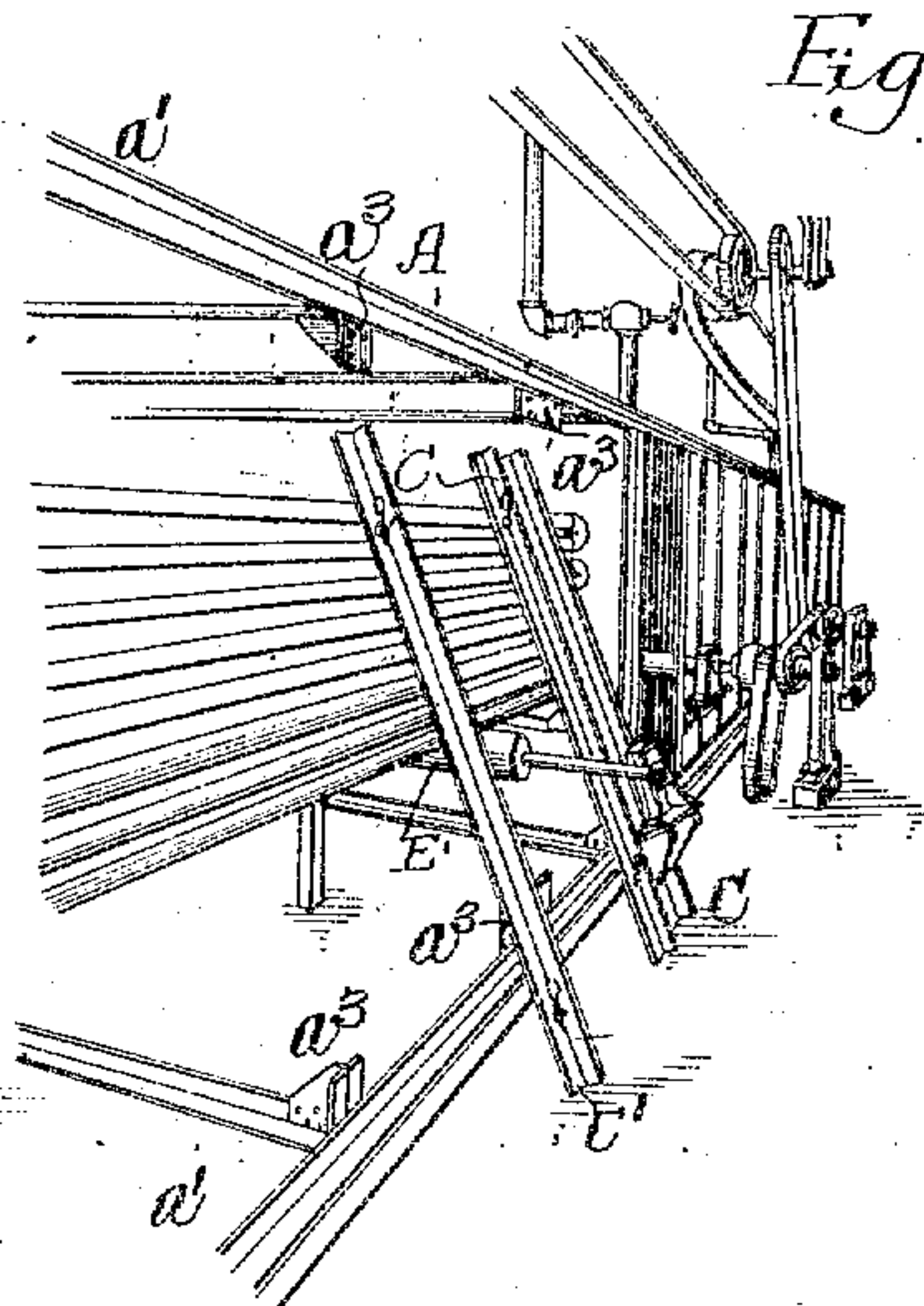
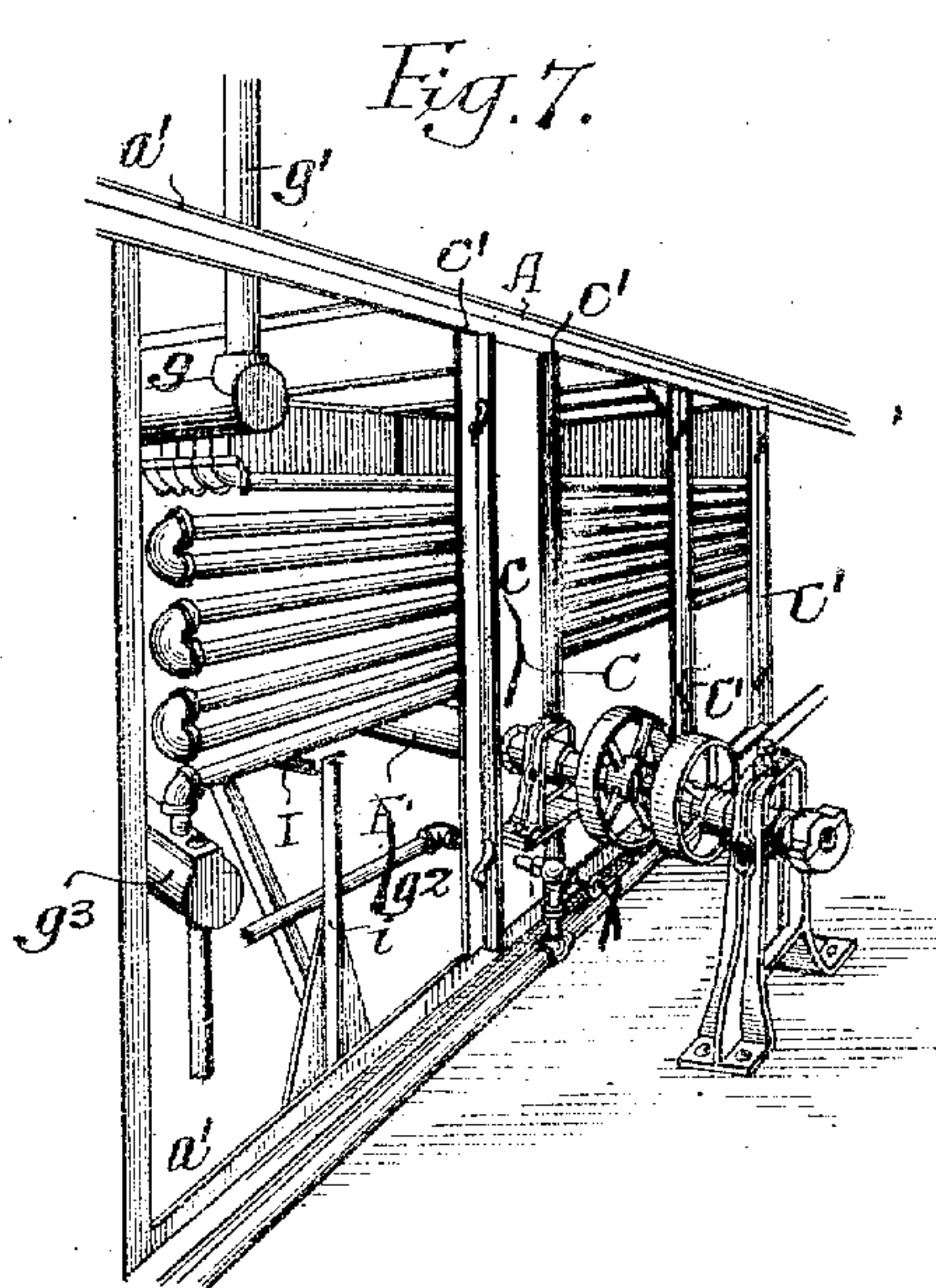
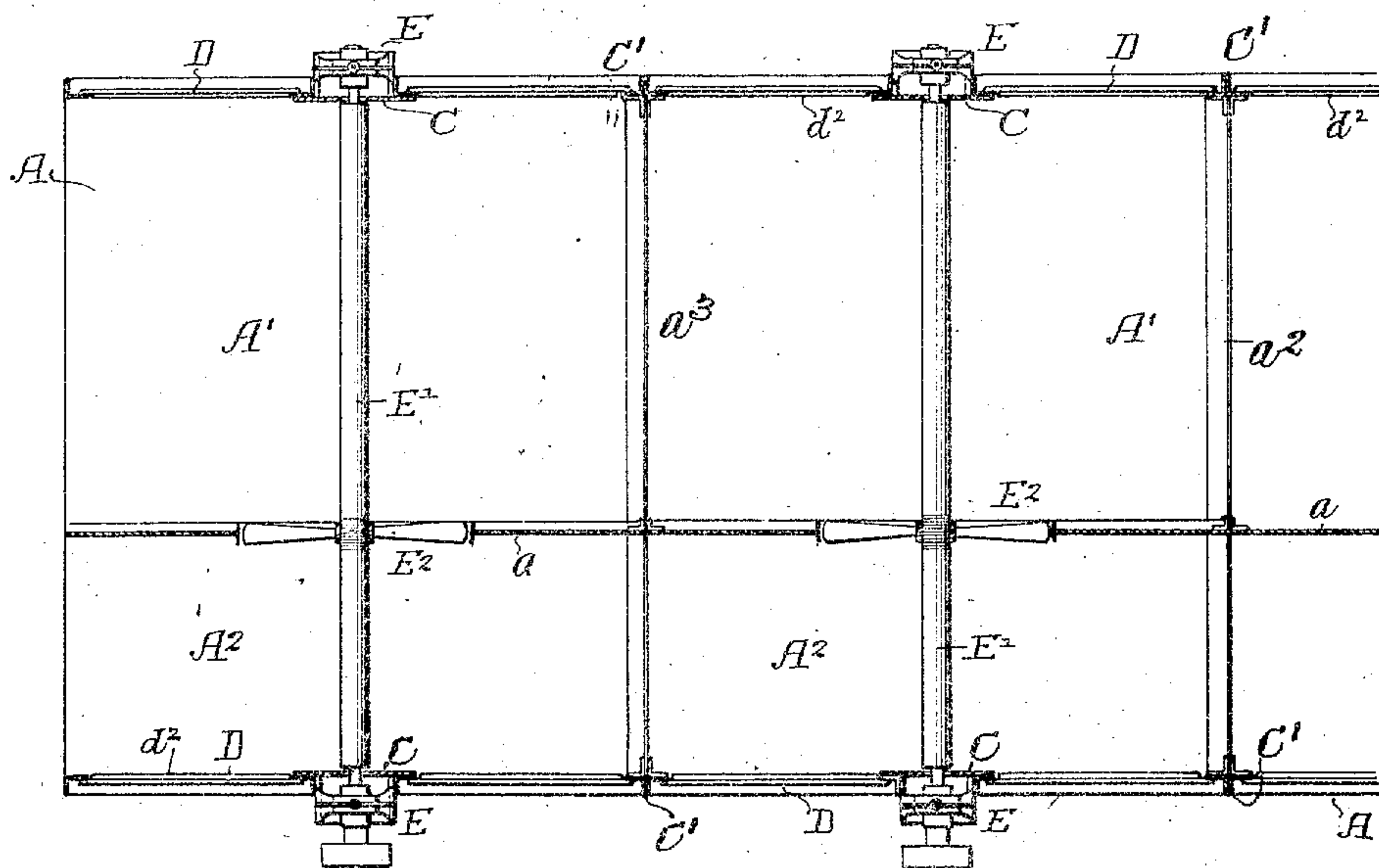


Fig. 4.



Witnesses—

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Howard M. Mum

UNITED STATES PATENT OFFICE.

ANDREW M. SCHREUDER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE PHILADELPHIA TEXTILE MACHINERY COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

DRYING-MACHINE.

962,865.

Specification of Letters Patent.

Patented June 28, 1910.

Application filed August 26, 1909. Serial No. 514,786.

To all whom it may concern:

Be it known that I, ANDREW M. SCHREUDER, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Drying-Machines, of which the following is a specification.

This invention relates to certain improvements in the construction of machines for drying material, the material to be dried being conveyed through an inclosed casing in which heated air is circulated. Heretofore, the casing of driers of this type were usually made of wood and the main object of the present invention is to make a casing entirely of metal and to arrange the sides of the casing that they can be readily detached so that access may be had to any part of the apparatus.

A further object is to provide the casing with a non-conducting lining and to provide means for properly supporting the steam pipes used in heating the apparatus.

In the accompanying drawings,—Figure 1, is a perspective view of my improved drier; Fig. 2, is a side view; Fig. 3, is a transverse sectional view on the line 3—3 Fig. 2; Fig. 4, is a sectional plan view on the line 4—4 Fig. 2; Fig. 5, is a sectional plan view on the line 5—5 Fig. 2; Fig. 6, is an enlarged view of part of Fig. 5; Fig. 7, is a perspective view of the drier showing the panels removed; Fig. 8, is a perspective view showing the uprights removed; Figs. 9 and 10, are detached views of one of the panels; Fig. 11, is a perspective view of one of the eccentric hand bolts; Fig. 12, is a perspective view of one of the pipe chairs, and Fig. 13, is a sectional view through one of the uprights.

A is the casing of the drier having two compartments A^1 and A^2 separated by a longitudinal partition a , as illustrated in Figs. 2 and 4.

B is the endless conveyer for carrying the material through the drier. The drier can be divided into as many compartments as desired by the use of transverse partitions. The conveyer passes around sprocket wheels b — b' carried by shafts mounted on suitable bearings at the ends of the machine. The sprocket wheels b in the present instance are driven through the worm b^2 and worm wheel

b^3 from the power driven shaft B' , though any suitable means may be used to drive the conveyer.

The frame of the casing A is made of structural steel and those parts which need not be removed are riveted together while the detachable parts are secured by bolts.

a^1 — a^1 are longitudinal angle members tied together by transverse members a^2 and angle bars are used where necessary to stiffen the frame.

The partition a is part of the permanent structure, but uprights C, C' as well as panels D at each side of the casing are removable so that access may be had to either compartment A^1 or A^2 . The uprights C' are made of two angle bars placed side by side, as illustrated in Figs. 4 and 5 and riveted together, while the uprights C are made of plates c and angle bars c' ; one angle bar being at each edge of the plate, as illustrated in Fig. 5. These uprights are detachably secured to plates a^3 permanently secured to the upper and lower framework of the drier as shown in Fig. 8. The uprights C are preferably lined with non-conducting material c^2 , such as asbestos, and a plate c^3 incloses the lining and laps over the edges of the angle bar c' , as clearly shown in Fig. 13.

The panels D extend from top to bottom of the casing and overlap the angle bars forming the uprights C, C' and are held in place in the present instance by eccentric clamp bolts e pivoted at e' . These clamp bolts can be of any form desired and by simply turning them in a vertical position the panels will be released and they can be readily removed, but when the panels are placed in position and the clamps turned as indicated in Figs. 1 and 3, then the flanges d of the panels will be pressed against the fixed portion of the frames by the bolts and will be held rigidly in position. I preferably place a non-conducting filling d' in each panel d so as to prevent, as much as possible, the radiation of heat. The panels are made of angle bars d^2 and a sheet of metal d^3 is placed against the angle bars, then the lining of asbestos, or other non-conducting material d' is placed against the plate, after which the plate is placed in position and bent around one

member of the angle bar d^2 , thus confining the non-conducting material and the plate d^3 to the angle frame d^2 . No bolts are necessary to fasten the plate d^4 to the frame.

5 The roof panels J are also made detachable and are preferably lined with non-conducting material.

The uprights C are arranged at intervals and support the brackets e of the bearing E in which the fan shafts E' are mounted. In the present instance the panels alternate with the vertical members c , but it will be understood that this arrangement may differ in other types of driers. The fan shaft E' carries a fan E^2 of any suitable construction, mounted in an opening in the partition a so that when the fan shaft is driven it will cause a circulation of air through the compartments A' and A^2 .

10 The heating pipes C are mounted on chairs I of the type illustrated in Fig. 12, these chairs are made entirely of metal and have two uprights i and i' secured to angle bars i^3 , the uprights support the transverse channel member i^2 and are suitably braced. The upright i' is at the back of the chair nearest the partition a and extends above the channel member and acts to retain the pipes C in position laterally. The pipes rest directly upon the channel members i^2 . The chairs are very rigid and simple in construction and when the panels and uprights are removed and the steam connections uncoupled, the entire steam coil can be moved out from the side of the drier without having to dismantle the entire apparatus as heretofore. It will be noticed in referring to Fig. 7 that the series of steam coils are connected to an upper manifold g to which the steam supply pipe g' is connected, this supply pipe extends through the roof so as not to interfere with the removal of the sides. The drip pipe g^2 is connected to a longitudinal return pipe at the floor. In some instances it may only be necessary to remove the uprights C' to gain access to the coil of pipes, but if the coil is to be entirely removed, then the uprights C' as well as the uprights C should be detached.

50 The bearings E for the fan shaft are so constructed that they can be readily withdrawn from the shaft when the uprights C, to which they are attached, are removed, without detaching them from said uprights as shown in Fig. 8.

I may provide one or more of the panels D with thermometer doors d^4 , as shown, the doors being preferably glazed so that the thermometer on the inside of the casing can be readily examined without opening the door.

I preferably make the entire apparatus of steel, all the supporting members being made of angle shapes and the panels, tops and ends of comparatively thin sheet steel

lined with asbestos or other non-conducting material.

In some instances I may make the uprights C and C' fixed parts of the apparatus and not removable, and this construction can be particularly used on the conveyer side of the machine, but on the steam coil side it is preferable to make both standards detachable.

I claim:—

1. The combination of a drier made of metal consisting of a framework having removable standards on one side and removable panels between said standards; a longitudinal partition in the drier and an endless conveyer on one side of the partition; heating pipes on the other side of said partition in position to be removed through the opening provided by the removal of the standards and panels; with means for circulating the air through both compartments of the drier.

2. The combination in a drier of a casing made of metal consisting of longitudinal angle bars and transverse bars, a longitudinal partition dividing the interior of the casing into two compartments, a conveyer in one compartment, heating pipes in the other compartment and means for circulating the air in the drier, a series of uprights on each side of the drier, detachable panels secured between the uprights, the uprights on the side of the drier containing the steam pipes being detachable so that ready access may be had to the steam pipes on the removal of the uprights and panels.

3. The combination in a drier of a casing made of metal consisting of a series of longitudinal angle bars and transverse bars firmly secured together, a series of uprights, one set of uprights being wider than the other, bearings carried by the wide uprights, a shaft mounted in the bearings, a fan mounted on the shaft for circulating the air in the drier, said drier having a longitudinal partition dividing it into two compartments, an endless conveyer in one compartment, heating means in the other compartment, a series of detachable panels between the uprights on the casing.

4. The combination in a casing made of metal consisting of a series of longitudinal angle bars connected by transverse bars, detachable side and top panels and uprights at each side, one series of uprights being wider than the other, bearings carried by the wide uprights, a fan shaft mounted in the bearings, a longitudinal partition within the casing of the drier, an endless conveyer in one compartment of the drier, a series of steam pipes in the other compartment of the drier, the steam inlet to the said pipes being through the roof of the drier and the outlet of the steam pipes being through the wide uprights so that all the panels can be re-

moved and access may be had to all parts of the drier without touching the steam connections.

5 5. The combination in a drier of a casing made entirely of metal having longitudinal angle bars at the corners and transverse bars connecting the angle bars, a longitudinal partition dividing the casing into two compartments, all of the said parts being riveted or permanently secured together, a series of uprights at each side extending from the floor members and the roof members, said uprights being detachably secured in place by panels arranged to overlap the uprights and means for attaching said panels to the uprights, an endless conveyer in one compartment, a series of heating pipes in the other compartment, circulating fans mounted in openings in the partition, shafts for said fans, bearings for the shafts mounted on the outside of the uprights, the shafts passing through the uprights.

6. The combination in a drier of a casing, a longitudinal partition extending through the casing and dividing it in two compartments, an endless conveyer in one compartment, a series of heating coils in the other compartment, chairs for supporting said heating coils and having two vertical members and a transverse member, one of said vertical members extending up alongside the pipes, the side of the casing of the drier being detachable so that access can be had to the coils.

35 7. The combination in a drier of a metallic casing having detachable panels, each panel consisting of a quadrangular frame made of angle bars, two plates spaced apart, the inner plate resting against one of the flanges

of the angle bars and non-conducting material between the two plates, the outer plate being turned in against the inner side of said flange, the parts being held together without rivets or other fastenings.

8. The combination in a drier of a casing made of metal consisting of longitudinal and transverse bars and uprights spaced apart, panels lined with non-conducting material, and detachably secured between the uprights and forming the sides of the drier roof panels, longitudinal partitions having openings therein and separating the casing into two compartments, an endless conveyer in one compartment, a series of chairs mounted in the other compartment, steam heating pipes mounted on said chairs, the inner members of the chairs extending up alongside of the heating pipes so as to hold them in position, the uprights on that side of the drier in which the heating pipes are mounted being detachable so that the inner sides can be removed when it is desired to detach the heating pipes, the steam inlet for said pipes being through the roof of the drier and the outlet pipes being through one or more of the uprights, fans mounted in the openings in the longitudinal partitions, shafts for the fans, said shafts extending through certain of the uprights, bearings secured to the outside of the uprights and supporting said shafts.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

ANDREW M. SCHREUDER.

Witnesses:

W. M. BROWN, Jr.,

W. M. A. BARR.