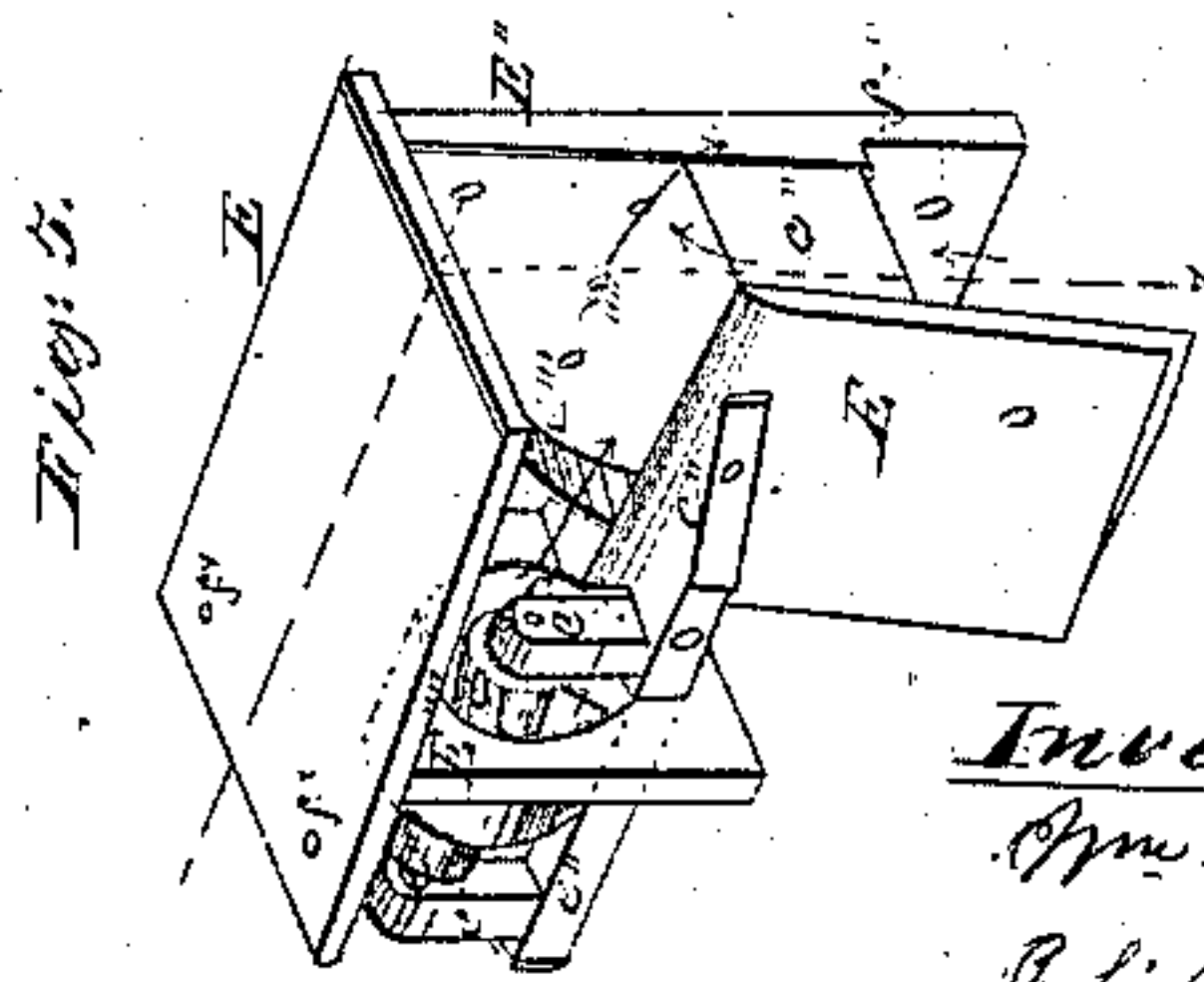
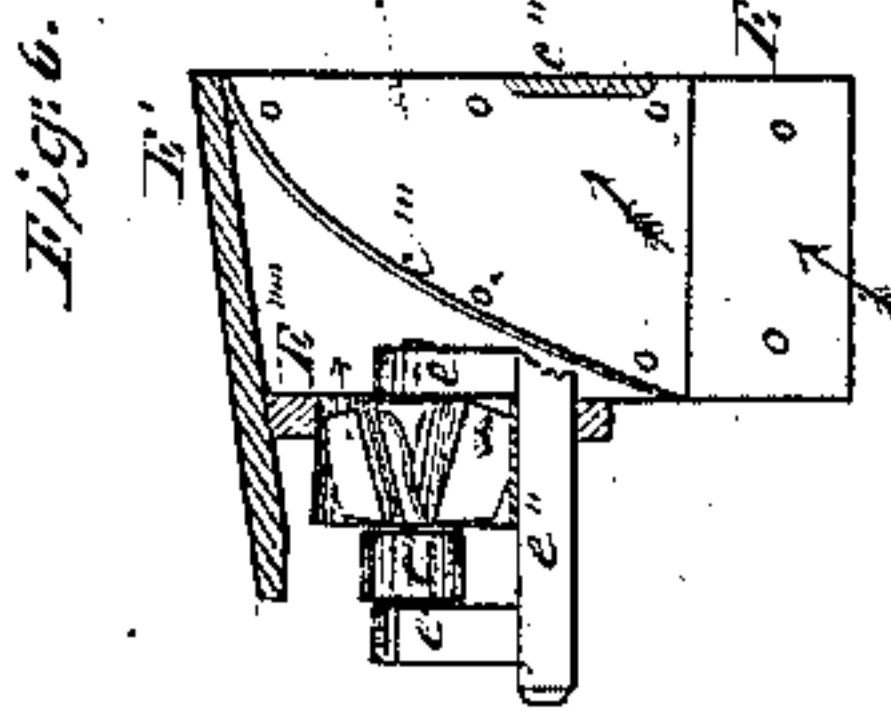
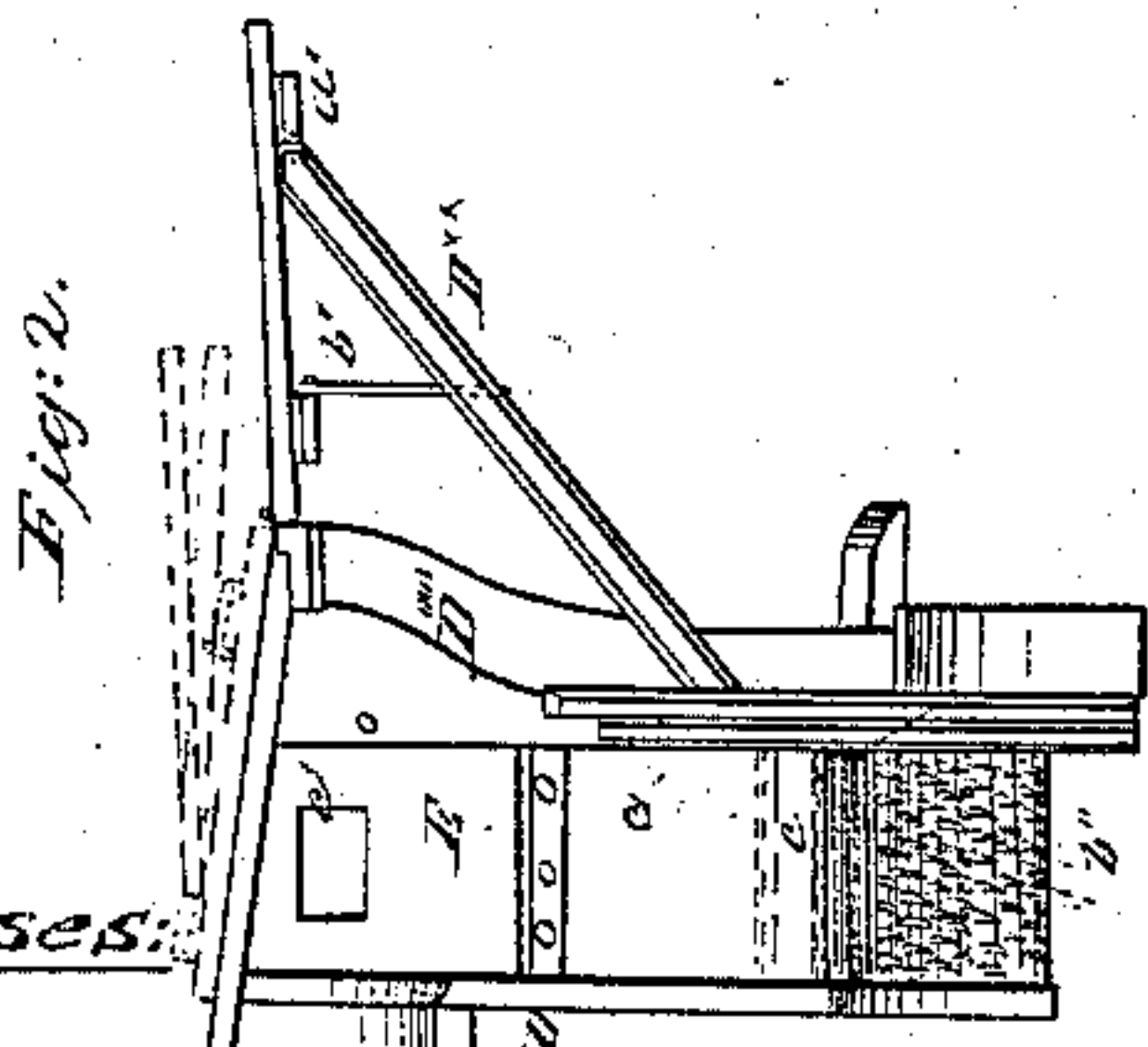
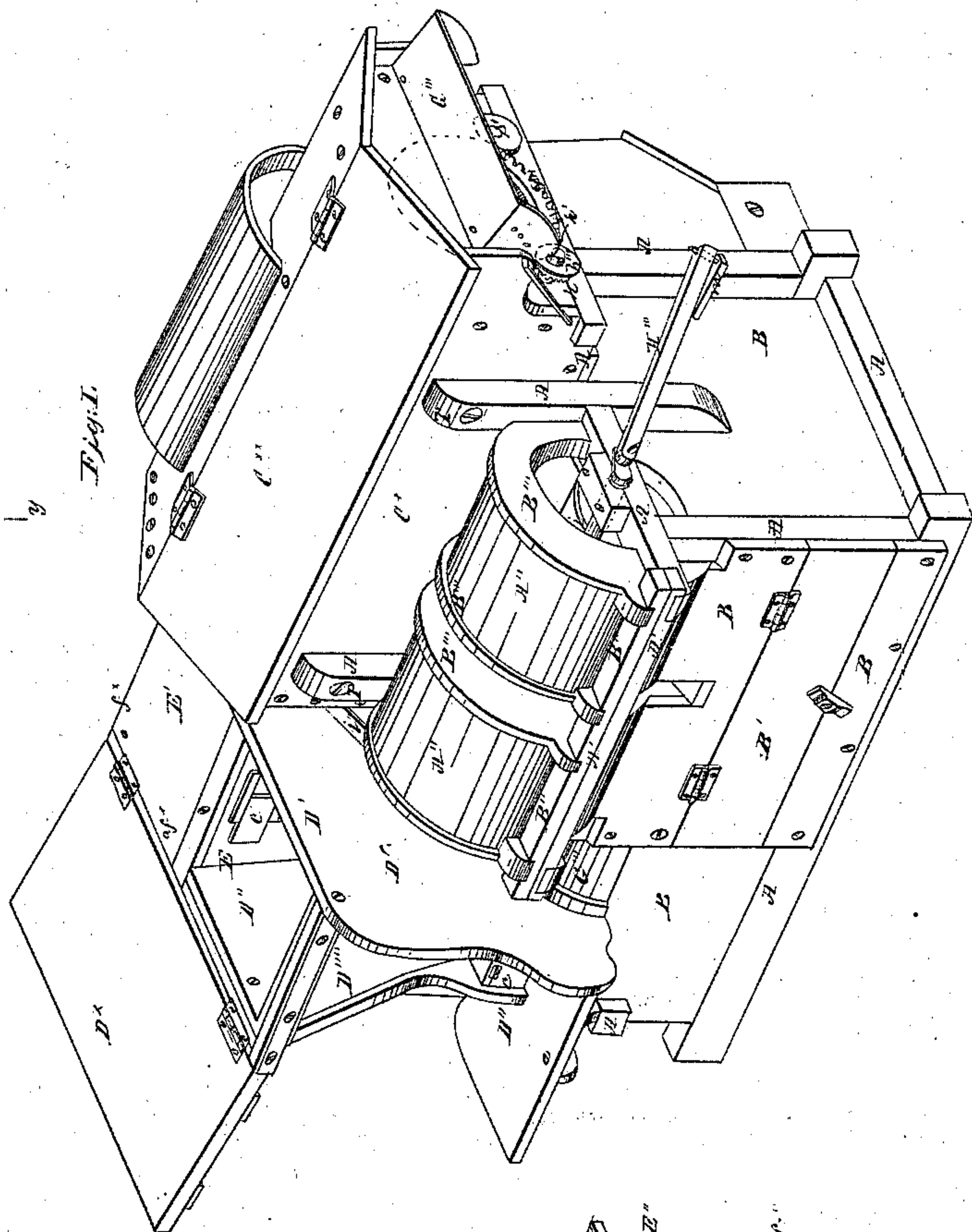
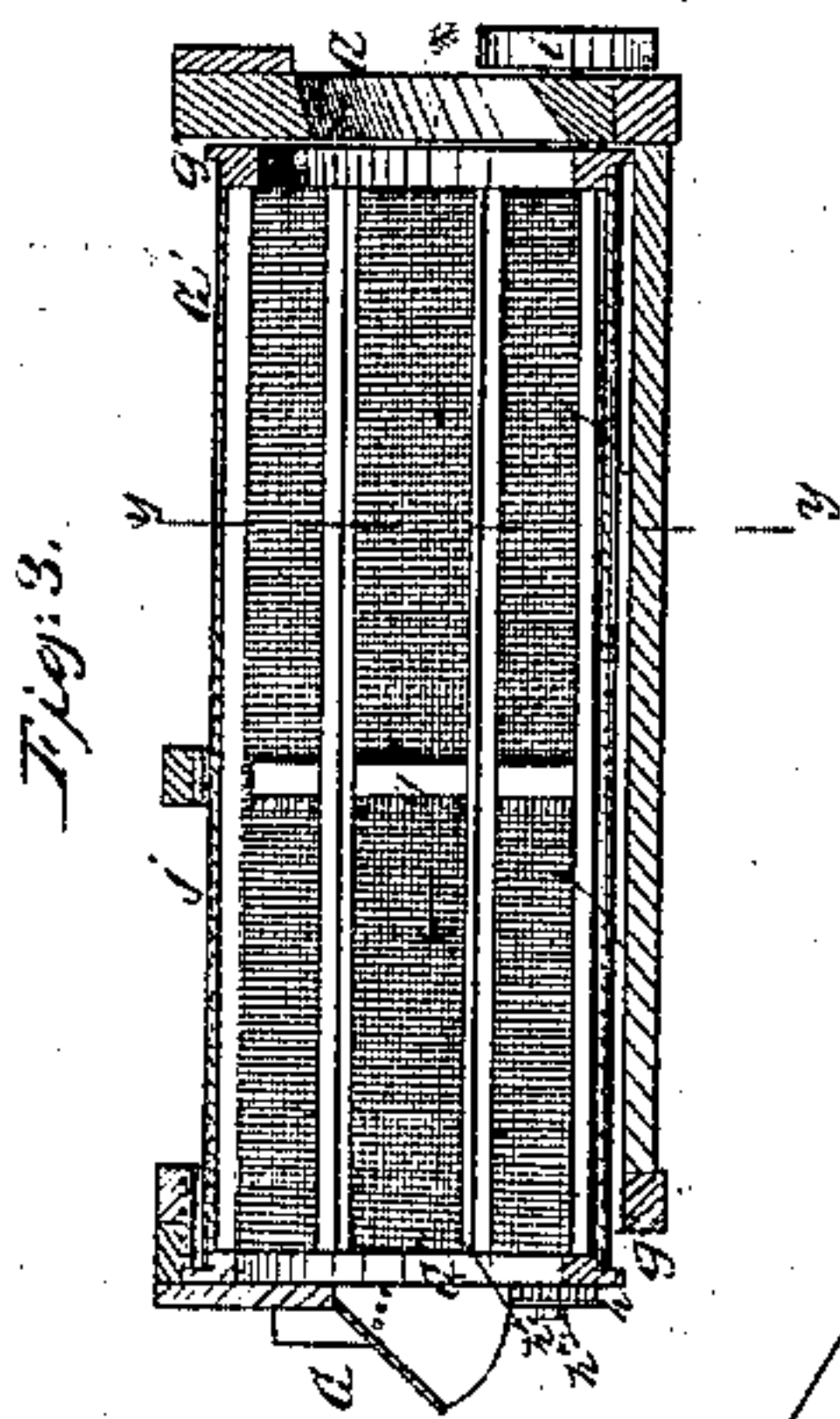
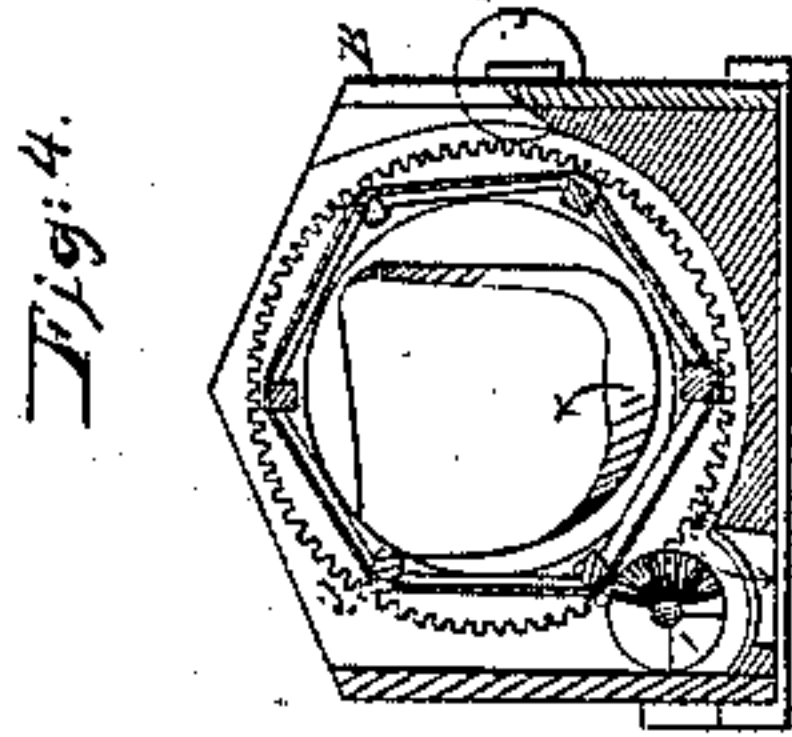


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N^o 32209.

Patented Apr. 30, 1861.



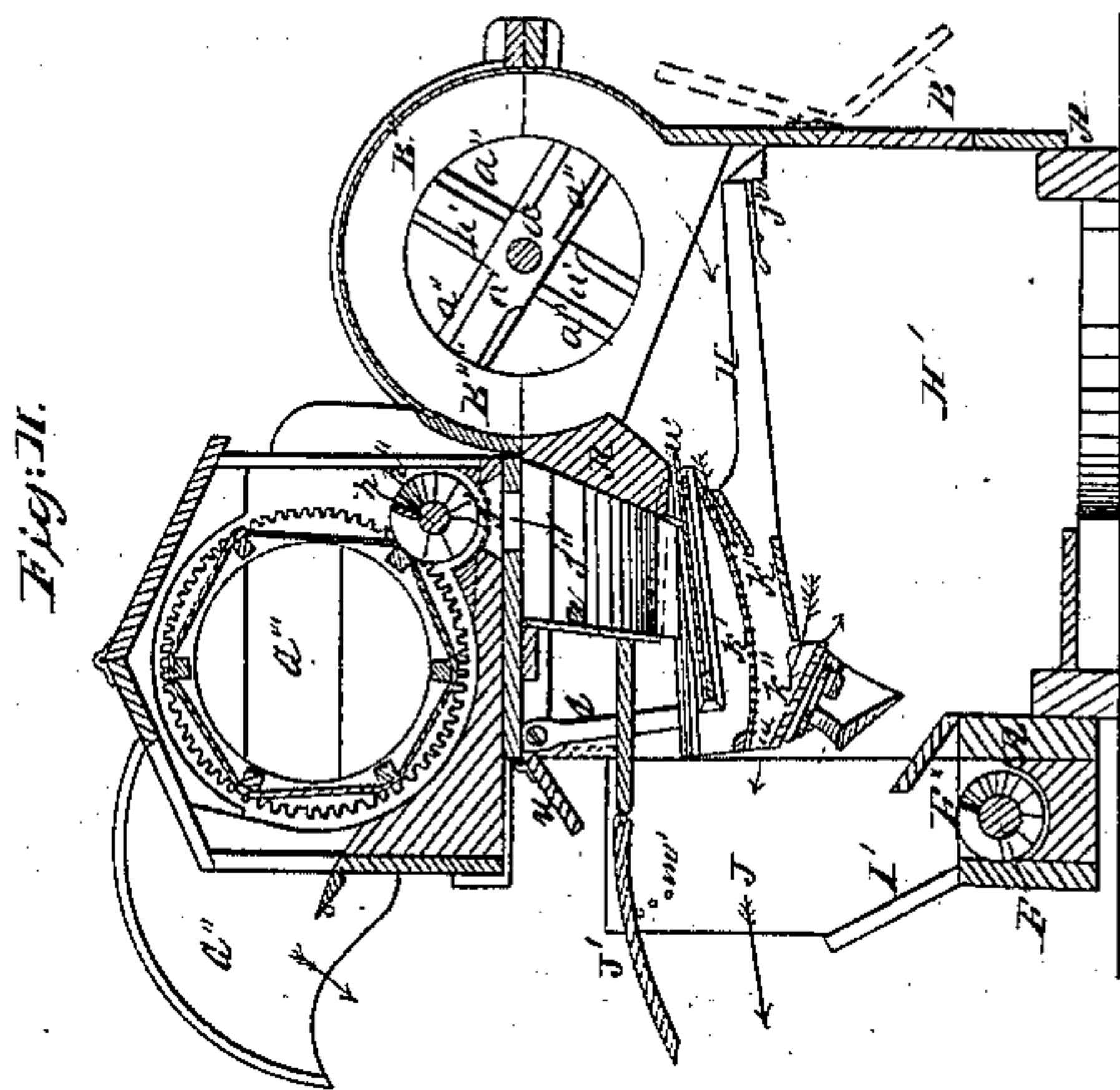
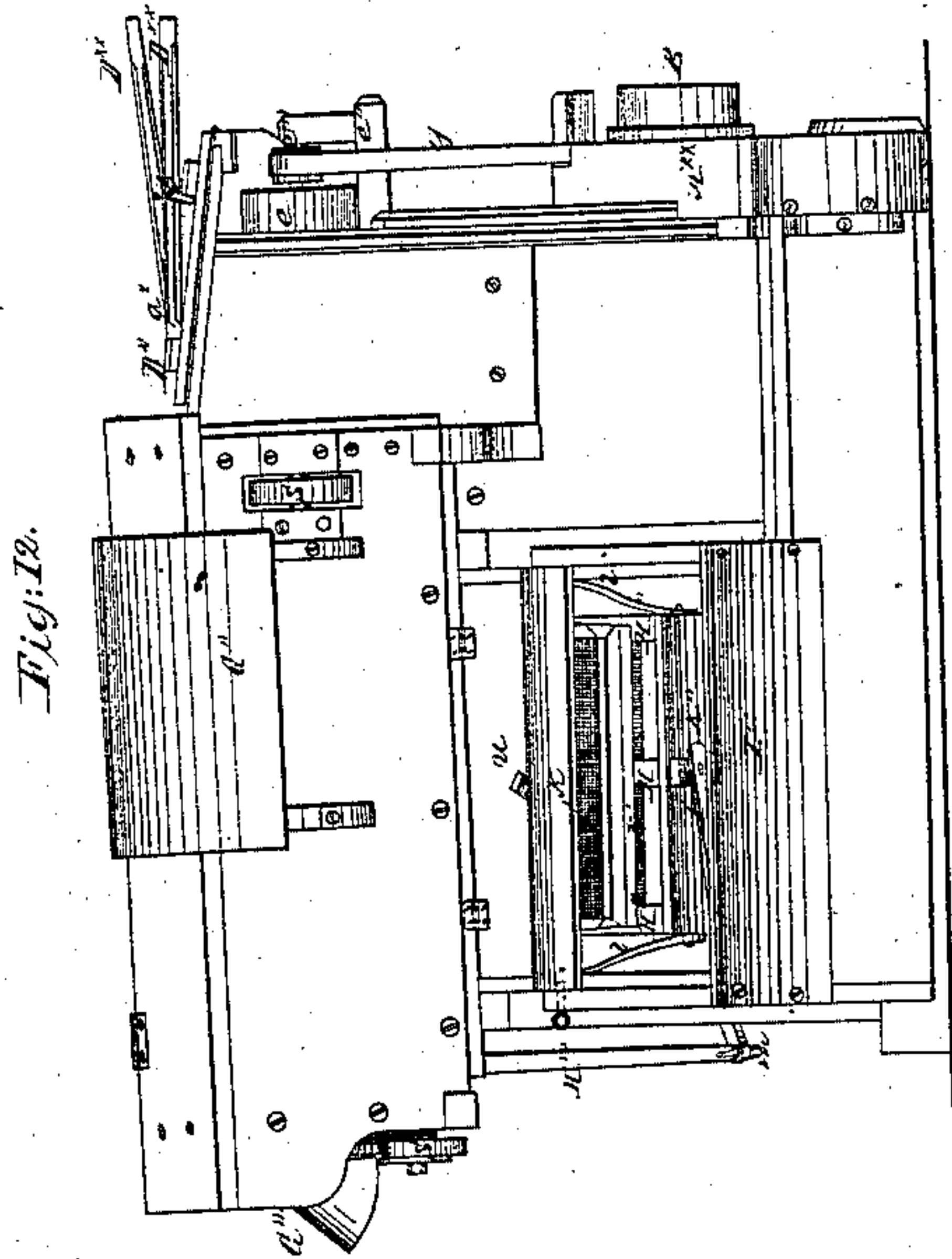
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UNITED STATES PATENT OFFICE.

WILLIAM ROWE, OF CHARLESTOWN, VIRGINIA.

IMPROVEMENT IN MACHINES FOR THRASHING AND CLEANING CLOVER.

Specification forming part of Letters Patent No. 32,209, dated April 30, 1861.

To all whom it may concern:

Be it known that I, WILLIAM ROWE, of Charlestown, in the county of Jefferson and State of Virginia, have invented certain new and useful Improvements in Clover Thrashers and Cleaners; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 represents a perspective view of my improved machine in position for operation. Fig. 2 represents a rear view of the hopper or feeding attachment detached, the folding feed table or board being represented in two different positions. Fig. 3 represents a rear longitudinal center view of the revolving screen with a part of its supporting-frame on a line $x x$, Fig. 10, as it would appear detached. Fig. 4 represents a transverse section of the revolving screen on line $y y$, Fig. 3, looking in the direction of arrow 1. Fig. 5 represents a perspective view of inclined chute and combined blast and suction fan detached. Fig. 6 represents a section of the same on line $z z$. Fig. 7 represents a plan or top view of the machine with the cover to revolving screen and double blast-fan together and with the parts represented in Figs. 2, 5, and 6 and the concave which covers the second or finishing cylinder removed. Fig. 8 represents an end view of the machine when in condition for use, as seen in Fig. 1, looking in the direction of arrow 2, Fig. 7. Figs. 9, 10, and 11 are sectional views of the machine when complete, as shown in Fig. 1 on lines $t t$, $w w$, and $v v$, Fig. 7, respectively, looking in the direction of arrow 2, with the exception that in Fig. 10 the fan-case A'' is removed. Fig. 12 represents a rear view of the machine with the feeding-table folded up, as shown in red lines, Fig. 2, looking in the direction of arrow 3, Fig. 8; and Fig. 13 represents a portion of the machine detached and reversed.

In the drawings, A represents the main frame of the machine, provided with suitable side or panel boards B. The portion of the machine under the bottom of fan-case A' is unoccupied by machinery, and is so left for the reception of a suitable box or measure to receive the thrashed and cleaned clover-seed. Access to this part of the machine can be had

through door B' . The other end of the machine is occupied by the thrashing-cylinders C C' , placed upon the same shaft b , which turns in suitable bearings. Cylinder C' is covered with a perforated metallic casings through which teeth of any required or desired size and form may be driven or screwed into the body of the cylinder, which can be made solid or hollow and of any suitable material. When the cylinder is of considerable length, it may be well to provide it with a binding ring or rings, as seen at c , and it should also be provided with fans d on one or both ends to give a strong current of air. Neither the fans nor the stay-rings should project beyond the ends of the teeth.

On front of the cylinders are supported stationary teeth $b' b''$, the teeth b' being driven or screwed into one of the side boards B in front of cylinder C, the inner surface of which is made concave, the teeth being so arranged or adjusted as respects those on the revolving cylinder C that their outer ends will come quite near to each other, but not so near as to touch. The concave in which the cylinders C C' revolve may be provided to any desired extent with stationary teeth, the judgment of the constructor governing in the matter.

The teeth in cylinder C' and in its concaves are to be of a somewhat finer character than those employed in cylinder C and its concaves, and I find it well to fasten them into thick leather or other suitable yielding material made fast to the cylinder and its concaves for the purpose of preventing the seed being broken or cracked in the final operation of cleaning the "sacks" from the seed.

C''' represents a removable concave provided with teeth, as above, and which covers the front upper part of cylinder C' , as indicated in Figs. 1 and 10. The upper front surface of cylinder C is covered by the feeding-box D, the right-hand side of which is represented by D' , the foot-board or stand for the feeder by D'' , the left-hand side by D''' , the front side by D'''' , and the back or rear part by E, while to the left upper edge of the feed-box is hinged a folding feed-table D^x , as fully shown in Fig. 1. This table has hinged supports D^{xx} , one at each end, which support the table when turned back, as seen in black lines, Figs. 1 and 2, their lower ends resting

against the side D''' of the feed-box, but which can be folded down upon each other when the machine is not in use, as shown in red lines, Fig. 2, where feed-table D^x is shown turned up and over the feed-box. Each standard D^{xx} is hinged to the table at two places, as seen at $a^x b^x$, so that one can fold over the other, thus rendering the machine very compact when not in use. Concave C'' is fastened to the side piece D' and to the side piece D''' by screws $c^x c^x c^x$.

The combined blast and suction fan box E is located just back of the feed-box and is fastened thereto at the top by screws f^x . Box E' is composed of rear part E'' , front piece E''' , and end pieces c'' and E'''' , the latter being cut out for the reception of the suction and blast fan e , which is supported in bearings $e' e'$, rising up from piece c'' , so as to turn or revolve in a case made fast to the part E'''' . An inclined chute c''' is fitted between the parts E'' and E''' , the wide part of the chute being fastened to the under side of E' , while its lower narrow end is fastened to the lower inner edge of the piece E'''' or to a piece fastened thereto. It will therefore be observed that the wind, as it is forced in by the fan e , will pass by the side of chute c''' and over the top of end piece c'' .

The operation of the machine is as follows: The cut clover stalks and heads, being fed into the box D from the table D^x , descend and are caught by the teeth on cylinder C , which is revolved by power applied to pulley B^x on the end of shaft b and are carried around against the stationary teeth on the concave C'' and below it, whereby the straw is broken up and the heads of clover torn and separated. The straw and partially-thrashed clover are carried by the force of cylinder C and the current of air caused by its fans and thrown up against the under side of chute c''' , by which the moving mass is directed into the open end G of revolving screen-cylinder G' . This operation is greatly facilitated by fan e , which sends a very powerful current of air directly past the front side of c''' into the screen G' , whereby a strong suction is caused, and all dust, partially-thrashed clover, and broken straw are drawn up from thrashing-cylinder G' and forced into the screen in a sort of whirling motion, whereby the separation of the seed from the sacks or hulls is greatly facilitated. The fine dust is blown through the screen and out of the adjustable exit-way G'' , while the straw is forced along and delivered at the opposite end of the cylinder which is open, but provided with a swing door or cap G''' , which can be adjusted to leave the opening greater or less, as fully indicated in Fig. 1. Screen G' is fastened to pieces g' , supported at each end by gear-wheels $g'' g''$ and in the middle by a tubular support g''' . Gears $g'' g''$ gear into and partially rest upon small gear h on the ends of shaft h' , which is provided with a screw h'' to work in a suitable

concave below it. The outer sides of gears h are provided with circular projections h'' , so that the screen cannot work endwise in the least, as its gears $g'' g''$ fit in between the projections h'' . The left end of shaft h' projects beyond the screen-frame, and is provided with a pulley i , whereby motion is communicated from pulley i' on the end of fan-shaft a by means of a belt i'' , as fully shown in Fig. 7, the belt being shown partially in Fig. 1. During the passage of the broken straw and clover-heads through the revolving screen G' the sacks or bolls containing clover-seed drop through the screen, together with any other thrashed seed, and are forced or moved into the concave of screw h'' by means of elastics j , such as strips of leather fastened lengthwise on the outside of screen G' . As soon as the sacks or bolls containing the seed come within the action of screw h'' they are directed back toward the thrashing-cylinders and pass over a grate j' under the screw h'' , so that all the seed which has been thrashed or completely separated is allowed to pass down through said grate j' and an opening in top board B , as seen at j'' , upon the first sieve k , thence through the second sieve k' upon the inclines $k'' k''$, from whence the seed upon the incline k'' slides back, while that upon incline k''' slides forward, the whole falling down between the inclines into a receptacle placed in the space H' under the sieves and double-fan box A' , access being had thereto through door B' . The sieves $k k'$ and inclines $k'' k''$ are supported and connected by side pieces $H'' H''$, while sieve k' and the inclines are further supported by a center piece H , hinged at j''' to the front of the machine, so that its front end can vibrate laterally, the rear end of the above parts being sustained by pendent arms $l l$. The necessary rocking motion is communicated to the sieves by means of a crank on the end of double-fan shaft a , upon which works one end of a connecting-rod H''' , whose other end is connected or pivoted to one end of a right-angled rocker-piece m , pivoted in the side of the frame, with its other end connected by piece I to the sieve device, as indicated in Fig. 12, so that as the fan-shaft revolves a rapid rocking motion is imparted to the sieves. The current of air generated by the double fans which work on shaft a passes under the center of frame-piece A , as indicated in Fig. 11, thence both above, between, and below the sieve and out at the adjustable exit J , which can be enlarged or reduced in size by door J' , which can be held in different positions by a pin placed in holes m' . The wind in passing through, as above stated, has to pass through the falling seed, and thus carries out all chaff, dust, and other impurities, leaving the clover-seed clean as it falls into the receptacle placed under the machine.

I have now shown how the seed which falls down through the grate j is cleaned; but this

is a small proportion of the seed, the largest part remaining in the sacks or bolls, which are carried back by screw h'' and dropped down through an opening J'' in the bottom of its concave and top board B , as indicated in Figs. 7 and 10, upon the finishing thrashing-cylinder C' . As the sacks and bolls fall upon the cylinder C' they are caught by its teeth and carried around against the teeth on the concave C''' , whereby the seed are completely shelled or thrashed from the sacks, and that, too, without breaking or cracking the seed, since the teeth of the cylinder and concave are fastened to elastic material, whereby they are caused to yield somewhat. The seed, chaff, dust, and other matter are carried round and thrown up and thence laterally through the opening K directly upon sieve k , from whence the chaff, dust, and other impurities are blown out the exit J , while the seed falls down into the receptacle, as before explained.

To provide against the loss of any seed in case some of the sacks or bolls should happen to pass entirely through the machine without the seed being separated therefrom, a box is placed at the rear side of the machine, provided with a long shaft F , upon which is fastened a screw F^x . This box is open on top under where the chaff is blown out at J , while an inclined guide-board I is extended up nearly on a line with the bottom of the sieves. The result is that all the sacks or bolls containing seed fall so as to strike against the guide I , and are thence guided down onto screw F^x , by which they are carried back to the thrashing end of the machine and delivered into the lower end of box or case A^{xx} , which supports one end of shaft F . A pulley F' is fastened to the end of shaft F , so as to turn in case A^{xx} , and by which motion is communicated to shaft F and screw F^x from a pulley f''' on shaft b by means of a belt f' . The belt f' is provided with cleats or projections f'' , and by which the sacks or bolls delivered into the case A^{xx} are carried up opposite an opening n in the end of the machine, through which the air is drawn by the action of cylinder C , whereby the said sacks or bolls are drawn in by the suction and carried up over the edges of the cylinder and are subjected to another fresh thrashing operation with the fresh stalks which are being fed in. The lower part of case A^{xx} is provided with a grate, as seen in Fig. 12, so that any seed which is completely separated from the sacks can fall or drop out without going through the machine again. It will thus be seen that the stalks and heads of clover are first subjected to cylinder C , by which the heads of clover are broken from the stalks and the sacks or bolls separated, and during which operation some of the seed is completely thrashed out, after which the stalks are delivered from the machine, as well as the thrashed clover, while the sacks or bolls are returned to cylinder C' and subjected to a second thrashing

operation, whereby the sacks or bolls are torn apart and the seed left in a condition to be separated from the chaff, dust, and other impurities by the common sifting and fanning operation. Cylinders C' C' are both on one shaft; but their teeth are separated by a dividing-ring L . The teeth on the concaves to each cylinder are also divided by suitable divisions, so that there is no connection between the two—that is, the material which is being operated upon by one cylinder has no connection with that in the other apartment, and the only way that the sacks or bolls can get from cylinder C to C' is by the course heretofore described. Openings covered with gratings are left in the bottom boarding B under the cylinders, so that air can pass up or fine seed drop out; also, for the purpose of letting water run out freely in case the machine should happen to be exposed to the weather.

The power to operate all of the various parts of the machine is derived from shaft b as follows: Shaft b extends outside of the machine sufficiently far to receive pulleys f''' , B^x , and B^{xx} . The power to drive the machine is applied to pulley B^x , while the blast and suction fan e is driven from pulley B^{xx} by a belt g and shaft F and screw F^x by belt f' on pulley f''' . The other end of shaft b extends through the side or partition board B , which separates the space H' from cylinder C' and is provided with a pulley o , upon which runs a bolt o' to drive pulley p , fastened to the edges of fans a'' , attached to arms a' on shaft a , from which motion is communicated to the sieves and screw-shaft h' , as before stated. The fans on shaft a are divided, as shown in the drawings, for the purpose of facilitating the ingress of air. The top caps A'' A'' and side pieces B''' are connected to front piece B'' and to rear piece B''' , so that all of said parts can be removed at once and together by simply removing one or two screws. The under casing A' extends only part way under the fans, (see Fig. 11,) thus leaving the air a free passage to the sieves. The screw-shaft h' has its bearings supported in a frame or box marked C^x and within which the screen G' is placed. The top of this frame or box is provided with a hinged cover or lid G^{xx} , whereby the screen can be examined at pleasure. Gears g'' g'' on the ends of screen G' rest against and turn in contact with friction-rolls whose bearings are in the rear of frame or box C^x . By simply taking out screws T T , Fig. 1, box or frame C^x together with screen G' and screw h'' , can all be removed together. The parts shown in Figs. 2 and 5 can also be removed together or separately. Concave C''' can also be removed very quickly, and that, too, without even taking out a screw, after the parts shown in Fig. 2 have been detached. The case A^{xx} can also be removed by taking out screws e^x e^x , when screw F^x can be drawn out of its box.

A^x is a projection or curved shield fastened to the outside of the part D''' to afford a sort

of chute for the air as it enters the opening n , and A^{xxx} is a similar guide-piece fastened to the end board B for a like purpose.

To the bottom of E is hinged a swinging valve or door c , which is forced forward by a current of air when the machine is in operation, as shown in red lines in Fig. 9. The object of this valve c is to prevent the stalks when fed in small quantities from falling in a mass down upon the first thrashing-wheel C instead of going down gradually. Of course the feeder can press the stalks into box D in such quantities as to force the valve back; but in this case the stalks would be held by the box itself from falling down too rapidly. The current of air which operates valve c is that which passes under the end of E''' or between the end of E''' and the surface of wheel C, the main current passing up, together with the stalks, on the opposite side of E''' into the screen G' through its open end G. Even the air which strikes against c passes up between E''' and E and thence into the screen, as indicated in Fig. 9.

c' is a slide-door whereby the passage G into screen G' can be examined and cleaned out when necessary without taking the machine apart.

t is a hinged door just over the concave C''' for admission into the passage which leads from the end of screw h'' down to cylinder C' , and which is kept closed by a button t' on the upper end of concave C''' .

U is a hinged door on the back of the machine, whereby access can be had to that part of the machine under screen G' .

$u u'$ are leather partitions or valves to keep the various currents of air from blowing out dust and chaff in an improper direction. They can be moved, however, back and forth by hand.

The separation of the cylinders can of course be effected in various ways, and therefore I do not confine myself to the mode above described. It will be well to apply fans to cylinder C' the same as to C, and I also apply fans f to the side of pulley F' to keep it from clogging, and also to give a slight current of air.

In the construction of my machine the frame can be differently constructed, as well as the parts connected therewith, and therefore I do not confine myself to the particular construction now shown, which has been devised with particular reference to making the parts so that they can be quickly detached and put together again. It will also be seen that the action of fan e is such that all the dust from thrashing-cylinder G is drawn by suction into screen G' , from whence it is ejected and may be carried into any particular place.

Having described my improved clover thrasher and cleaning machine, what I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of two thrashing-cylinders with a clover-separating machine, when said cylinders are arranged to rotate on the same axial line, the cylinders operating independently, as and for the purposes stated.

2. The combination of the cylinders C C' with their concaves C'' and C''' , substantially as and for the purposes stated.

3. The combination of cylinders C C' with feed-box D, blast and suction fan e , screen G' , and screw h'' , substantially as and for the purposes stated.

4. The combination of screen G' with the box-frame C^x and screw-shaft h' , with its guide-gears, as and for the purposes set forth.

5. Making the feed-box D so that it, together with the parts connected therewith, as shown in Fig. 2, can all be removed, as and for the purposes stated.

6. So making and connecting the parts shown in Fig. 5 as that they can be quickly detached for repairs or examination of the machine.

7. A clover thrashing and cleaning machine in which the parts are constructed and combined to operate in relation to each other as shown and described.

In witness whereof I have hereunto subscribed my name.

WM. ROWE.

In presence of—

E. M. AISQUITH,
F. A. SIMPSON.