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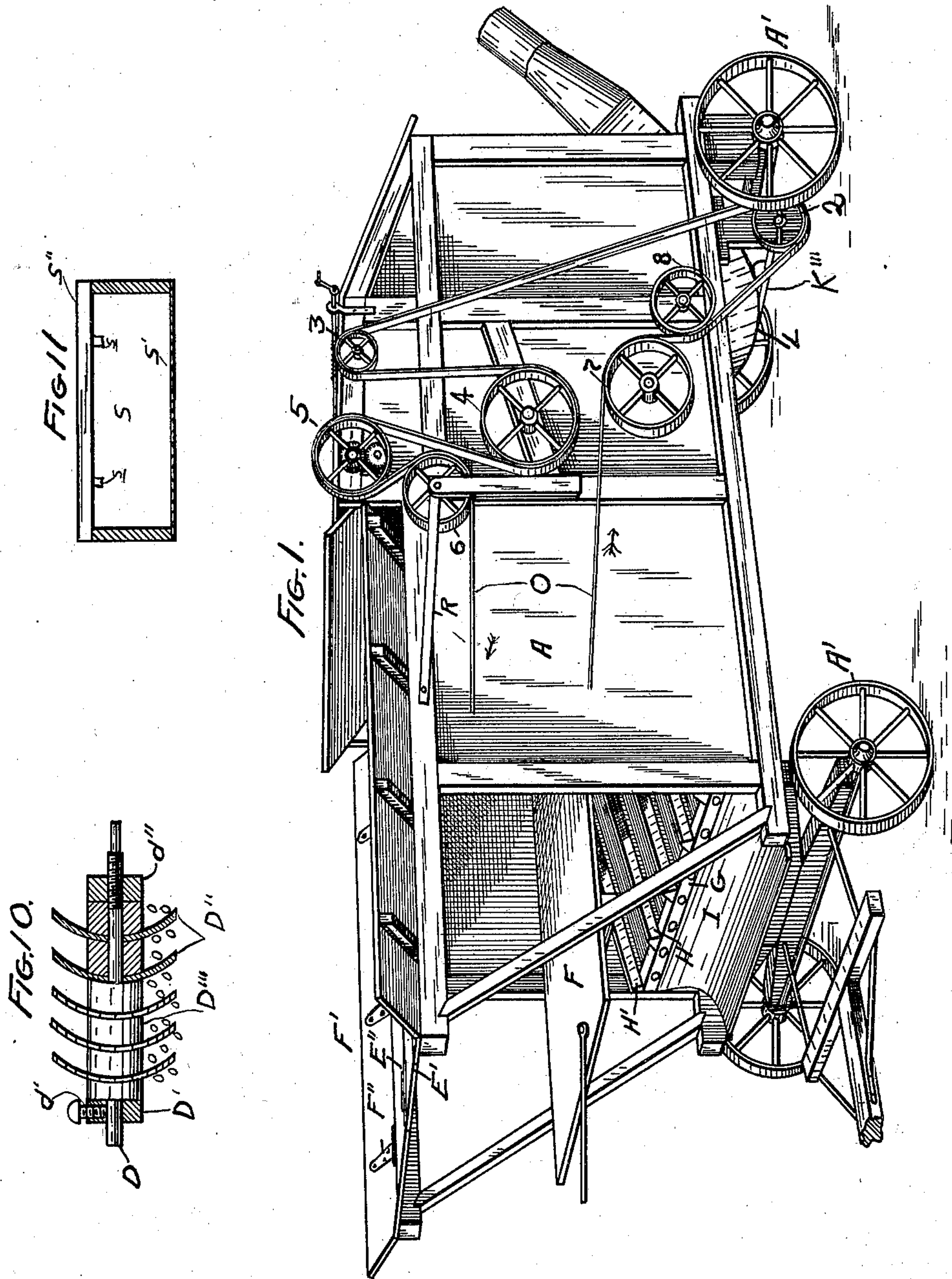
Patented Sept. 2, 1902.

J. K. SMITH.
CORN HUSKING MACHINE.

(Application filed June 18, 1900.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES:
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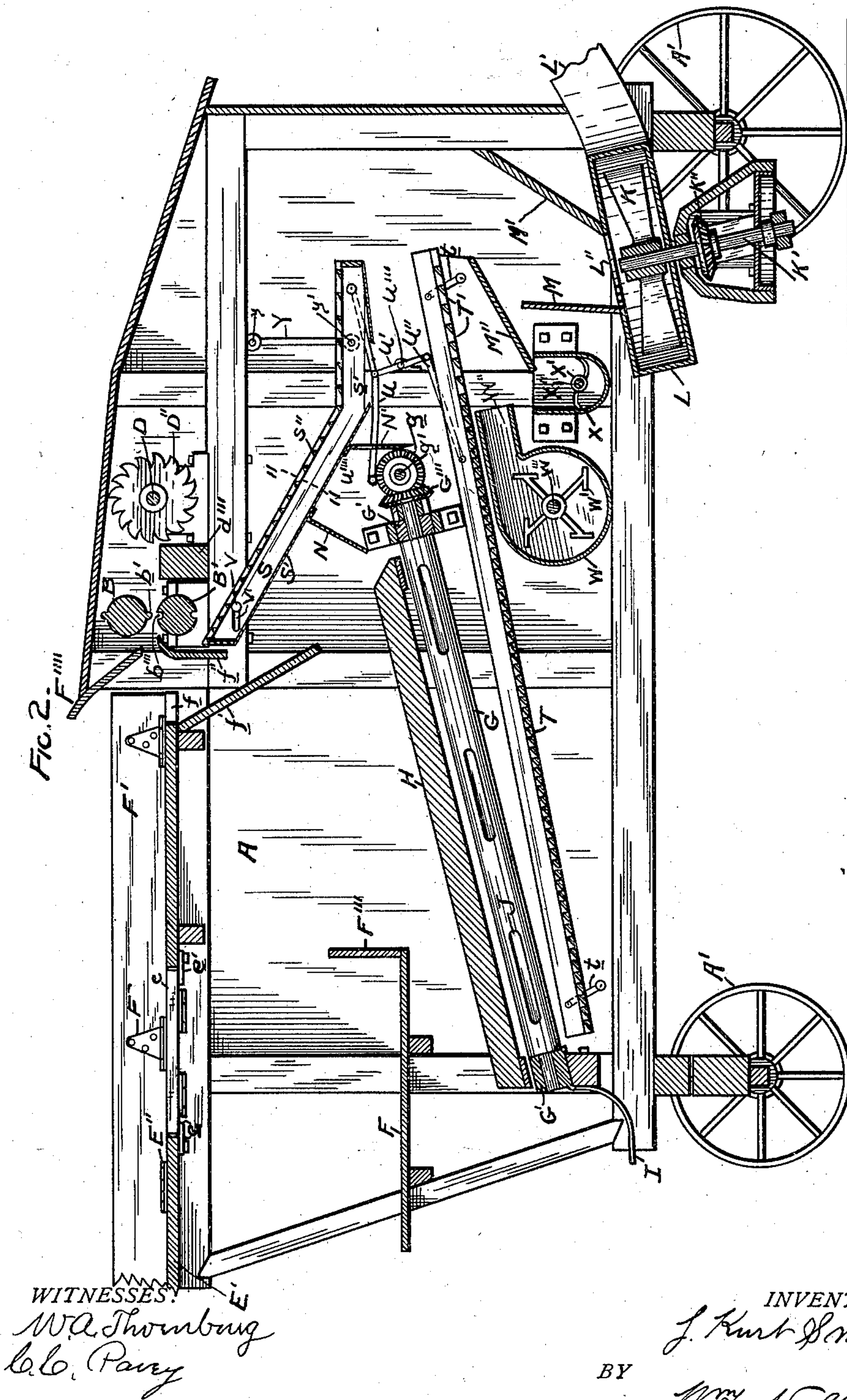
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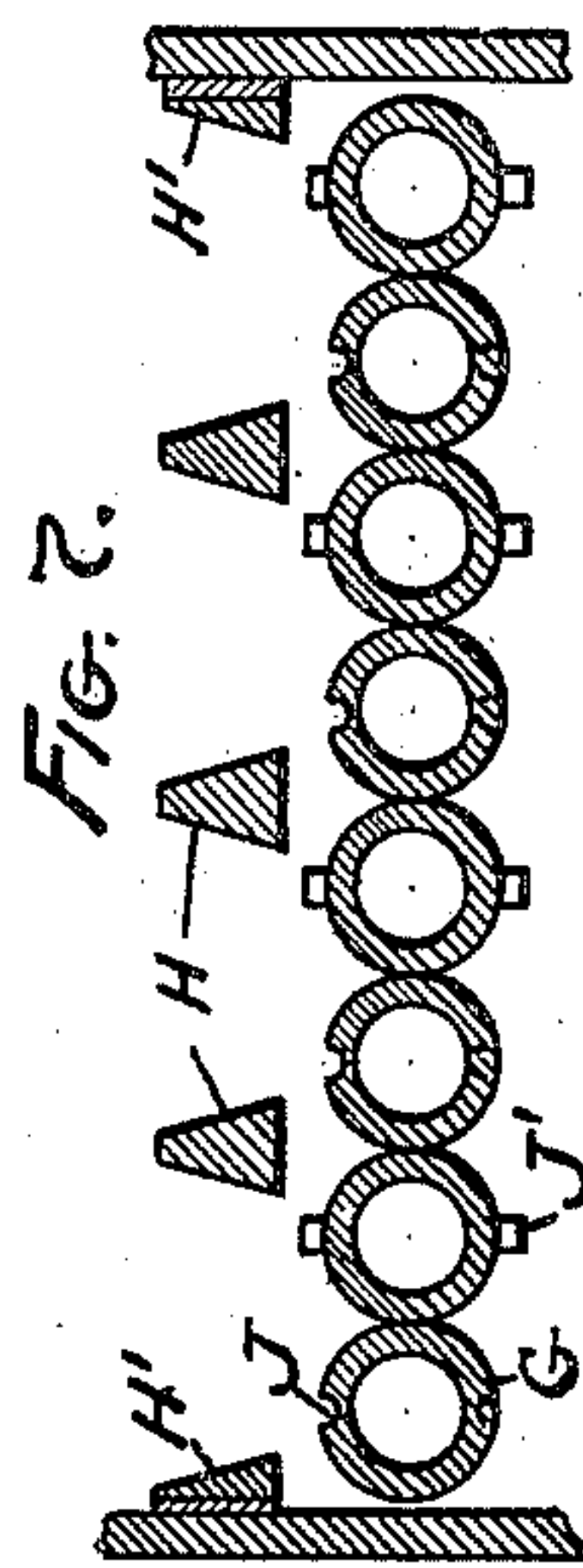
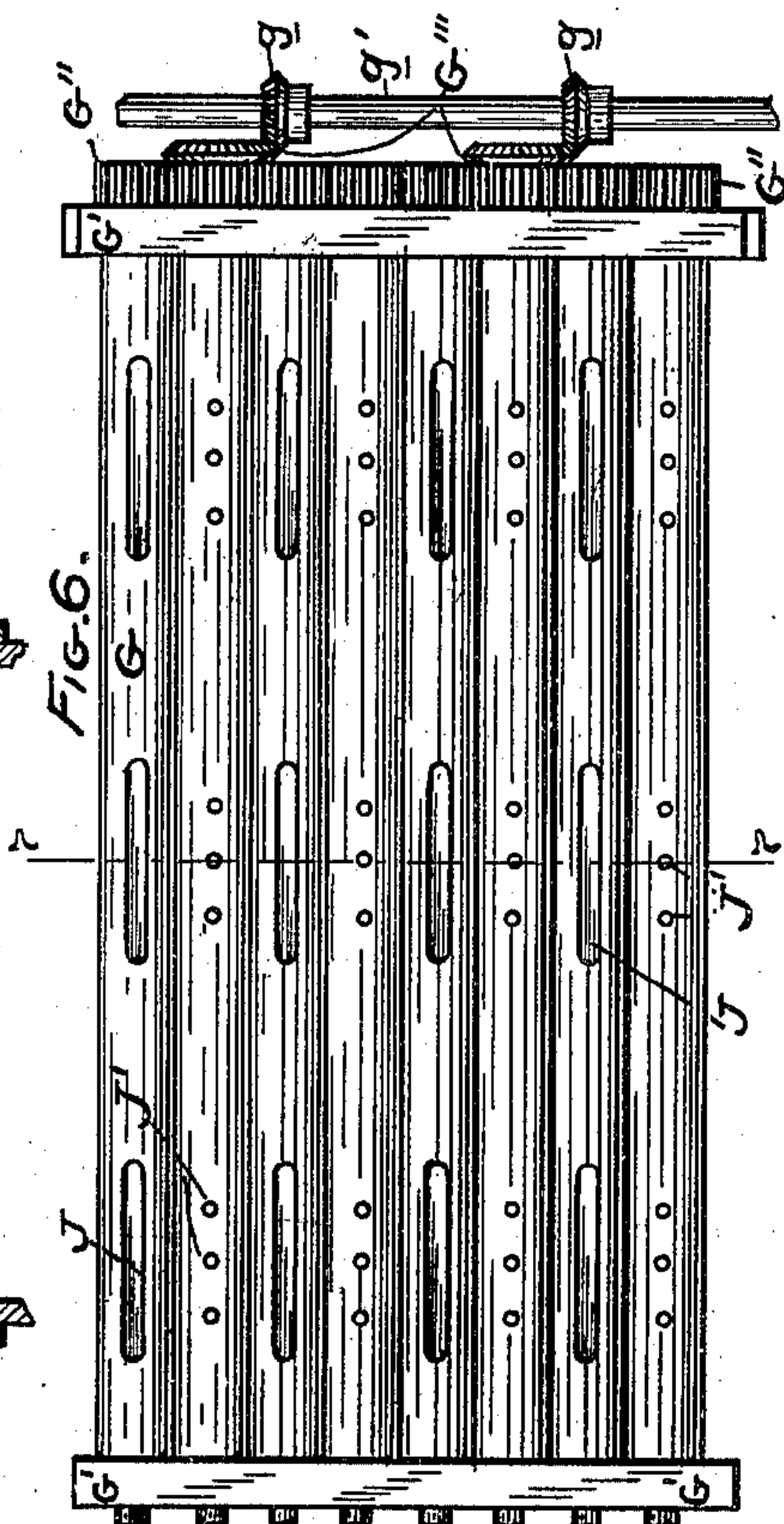
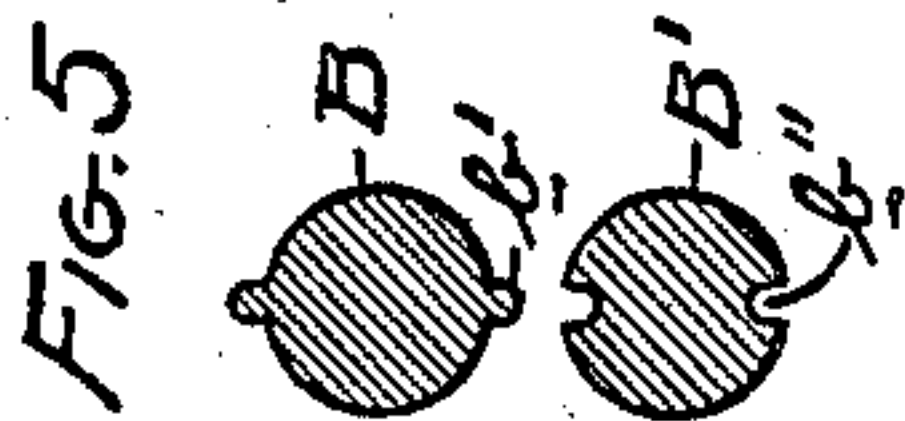
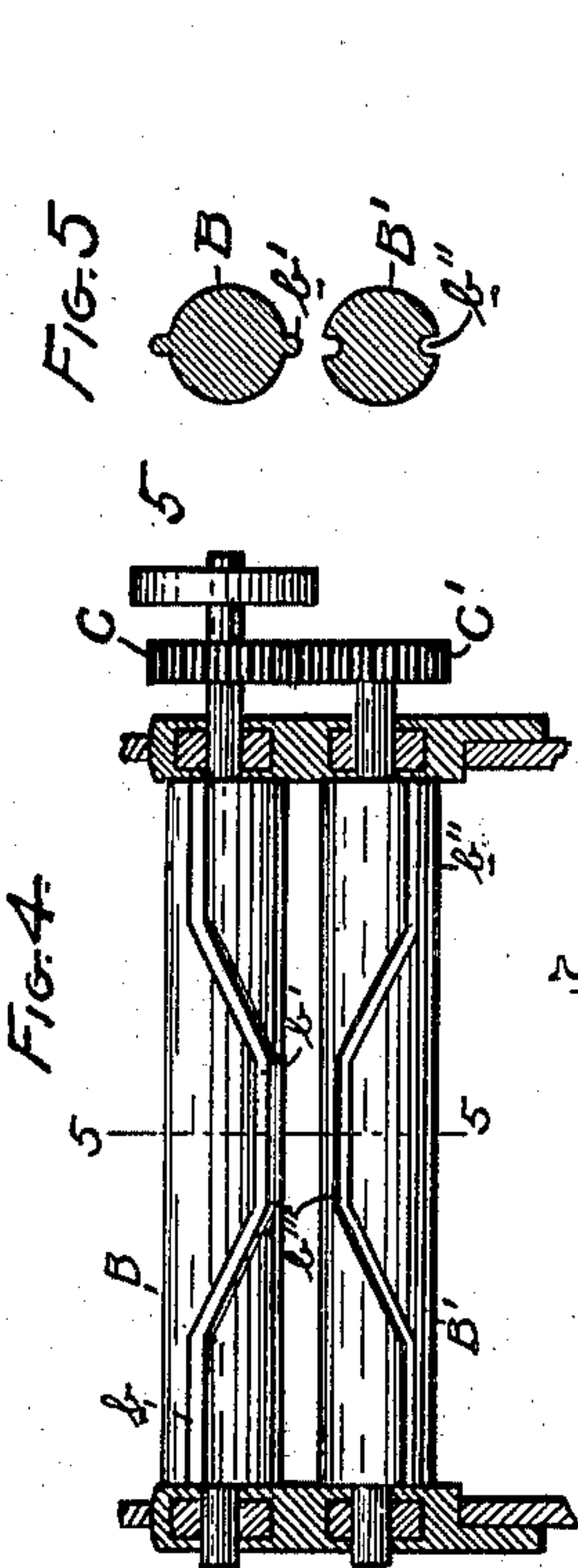
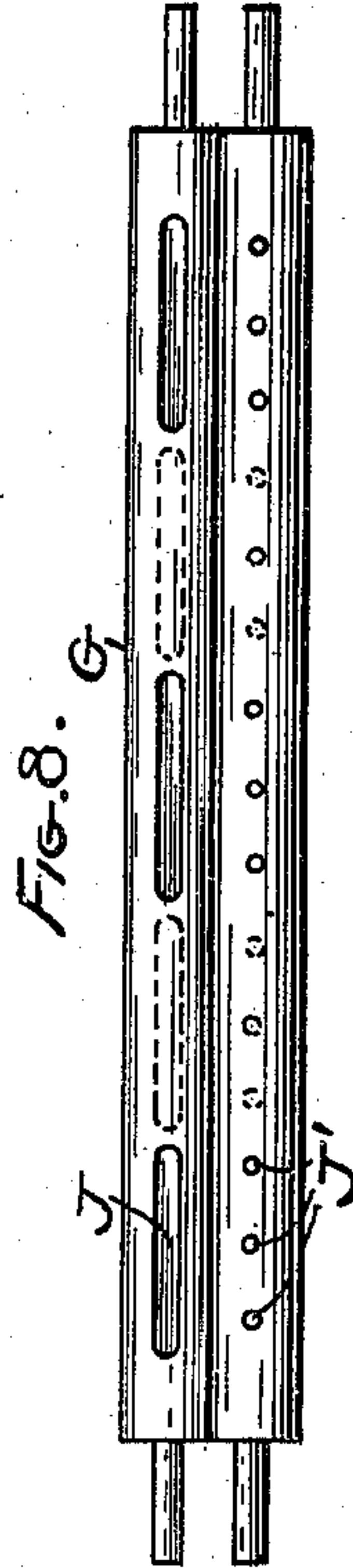
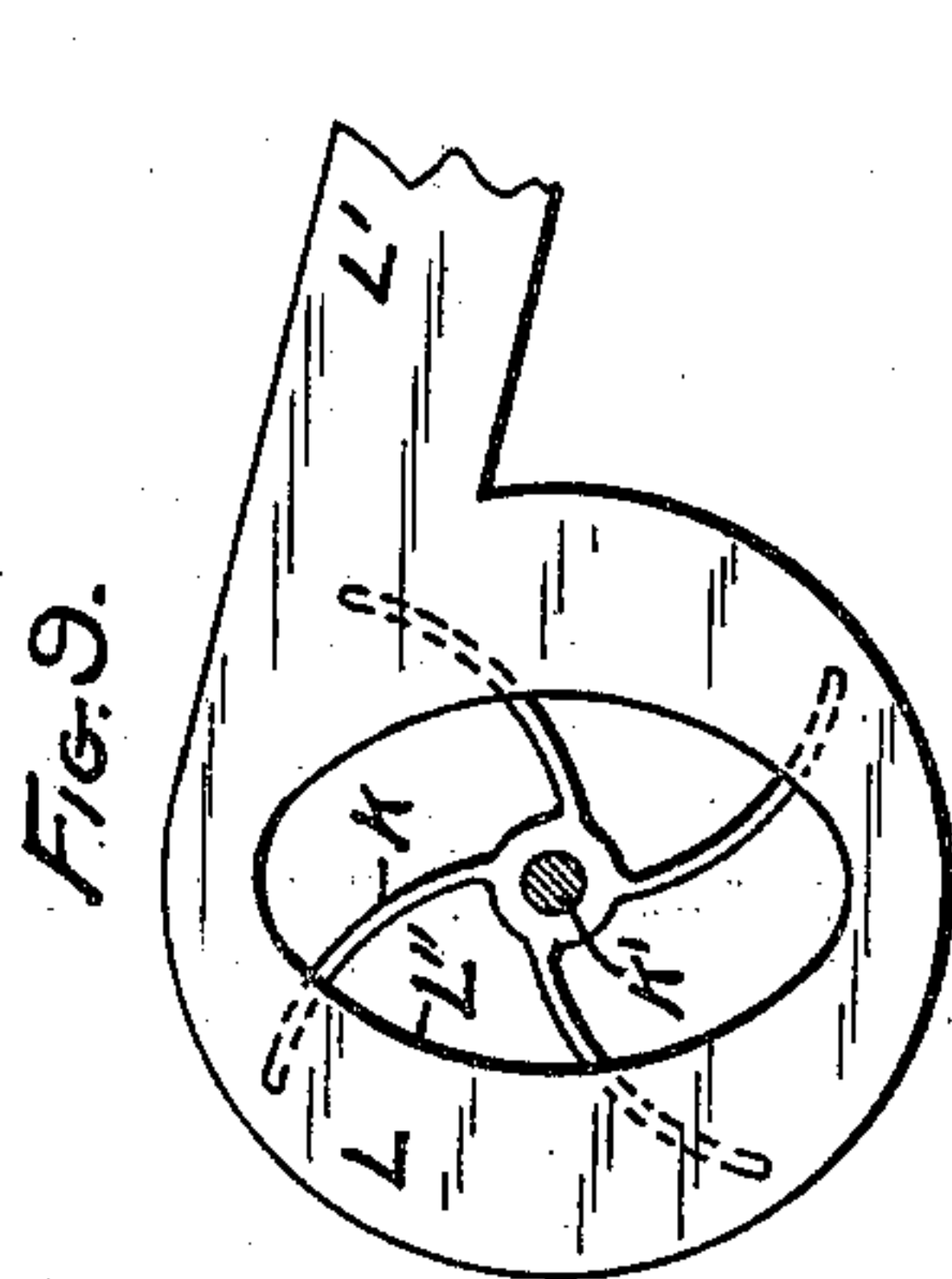
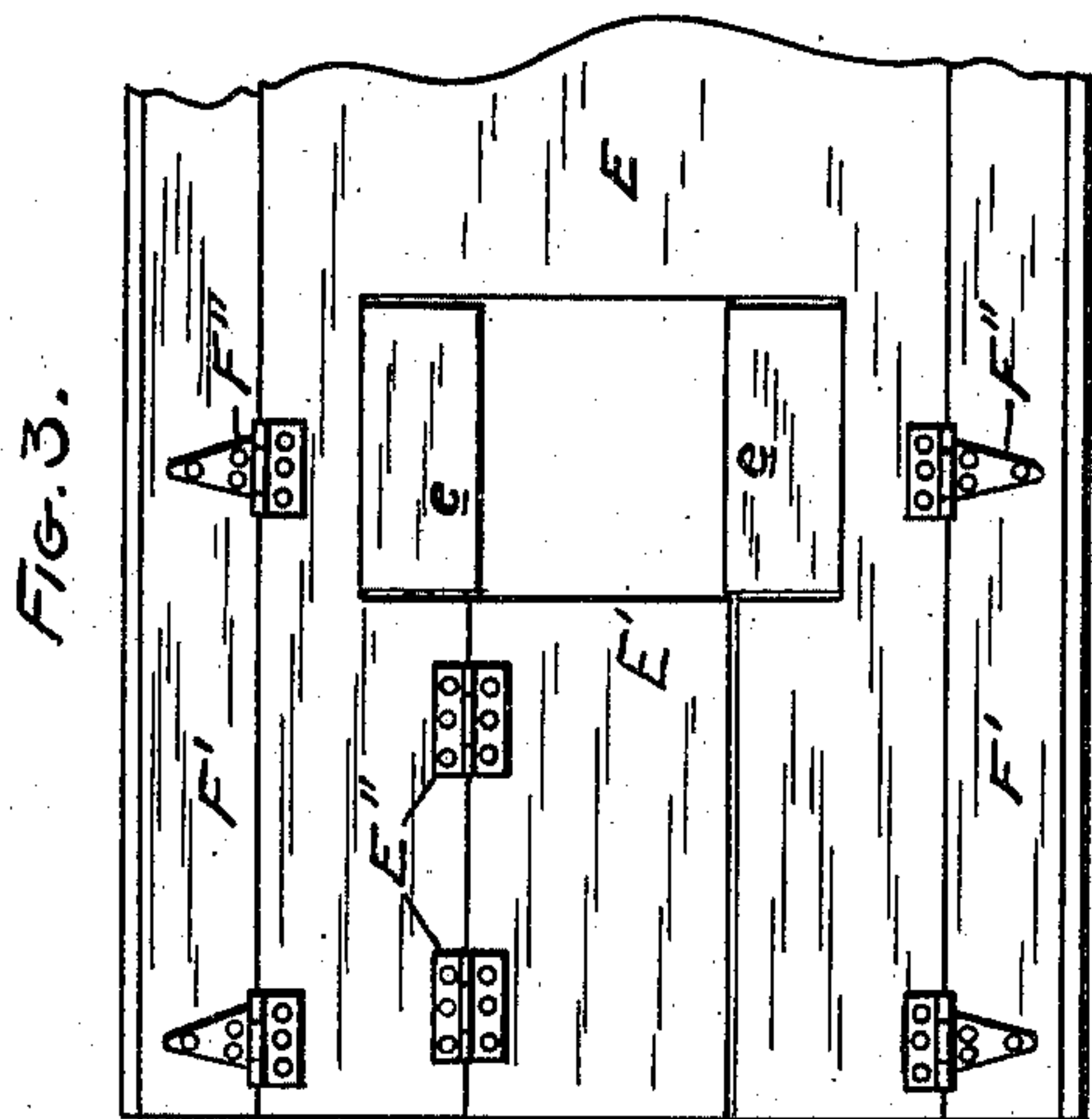
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3 Sheets—Sheet 3.



WITNESSES:
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UNITED STATES PATENT OFFICE.

JOHN KURT SMITH, OF HARTFORD CITY, INDIANA.

CORN-HUSKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 708,500, dated September 2, 1902.

Application filed June 18, 1900. Serial No. 20,671. (No model.)

To all whom it may concern:

Be it known that I, JOHN KURT SMITH, a citizen of the United States, residing at Hartford city, county of Blackford, and State of Indiana, have invented a new and useful Corn-Husking Machine, of which the following is a specification.

My invention relates to a new and useful corn-husker and fodder-shredding device for cutting the fodder into shreds.

A further object is to construct a machine with cleaning devices to thoroughly clean the fodder and husks of all loose corn, so that none will escape.

The invention also relates to a machine so constructed that the operator can stand within the frame and the stalks be fed to him from both sides thereof and by him to the snapping-rolls, also in constructing the snapping-rolls in rigid bearings, the rolls being spaced apart, and placing the shredding-knives in the rear of the snapping-rolls, and in providing a pneumatic exhaust-fan for stacking the cut fodder and husks.

A further object is to construct the husking-rolls so that they can husk the ears without the aid of beaters or other means for forcing the ears onto the rolls.

These and other objects not hereinbefore mentioned are accomplished by the construction illustrated in the accompanying drawings, wherein like characters of reference indicate corresponding parts in the several views, and in which—

Figure 1 is a perspective view of my improved machine. Fig. 2 is a vertical longitudinal section through Fig. 1. Fig. 3 is a top plan view of the front or feeding portion of the frame. Fig. 4 is a side elevation of the snapping-rolls. Fig. 5 is a cross-section on the line 5 5, Fig. 4. Fig. 6 is a top plan view of the husking-rolls with the guide-pieces removed. Fig. 7 is a cross-section on the line 7 7, Fig. 6, showing in addition the guide-strips and the side of the frame. Fig. 8 is an enlarged detail view of two or one pair of husking-rolls. Fig. 9 is a top plan view of the fan-casing and fan. Fig. 10 is a side elevation of the shredding-knives, showing the means for securing them to the shaft; and Fig. 11 is a cross-section on the line 11 11, Fig. 2.

In the drawings, A designates the casing, supported on the wheels A'. The casing is open at its front end and has its sides and rear portion closed.

B B' designate the snapping-rolls. These rolls are rigidly journaled on the frame near the upper rear end of the casing, one above the other, preferably about one-half inch apart, although the distance can be varied in some cases. The upper roll B is a smooth cylinder provided with a longitudinal projection or rib *b*. This rib, as plainly shown in Fig. 4, has its central portion extending forward in the direction on which the roll revolves, as shown at *b'*. The lower roll B' is also a smooth cylinder provided with a complementary concave groove *b''*, provided with the central forward extension *b'''*. By rigidly journaling the snapping-rolls on the frame a large amount of stalks can be fed therethrough without chocking the rolls or forcing the rolls out of gearing. By providing one roll with the projection or rib which has the forwardly-extending central portion and the other roll with the complementary groove the stalks will be pulled through the rolls as fast as they can be fed by the operator or even two operators located in the center of the machine, who receive the stalks from either or both sides of the machine, as hereinafter described. As before stated, the rolls are cylindrical in cross-section and have a smooth outer surface, with the exception of the rib and groove, and are spaced apart in rigid bearings, and when the rib is opposite the groove in the lower roll it will be noticed that there is still the same space between the rolls, thereby preventing the rolls from chocking. By forming the groove in the lower roll rounded or concave, the stalks cannot stick therein, as they might if the groove was formed square. The upper roll B is provided with a pinion C on its shaft, which meshes with a pinion C' on the shaft of the lower roll. Motion is imparted to the rolls by means of the pulley 5 on the shaft of the upper roll.

On the frame, in rear of the snapping-rolls, is journaled a shaft D. Motion is imparted to this shaft by means of the pulley 3 on the outside of the casing. On one end of this shaft, within the casing, is a block D', held

in place by a set-screw d' . The inner side of this block is concave. D'' designates a rotary shredding-knife. These knives are circular and concavo-convex or dish-shaped, as shown in Fig. 10. These knives are placed on the shaft at intervals, being spaced apart by means of the concavo-convex blocks D''' , and extend entirely across the interior of the casing. The knives on one end of the shaft are held in place by the block D' , and on the other end of the shaft is a nut d'' for forcing up the knives and concavo-convex blocks, so that the knives will be firmly held on the shaft. Between the snapping-rolls and shredding-knives is placed a cutting-bar d''' . As the object of these knives is to shred the stalks after the ears have been removed by the snapping-rolls, the importance of forming the knives in the shape shown will become apparent. The stalks will leave the snapping-rolls substantially parallel with each other and with the sides of the casing. If the knives had ordinary straight sides, there would be some stalks which would pass between the knives and not be shredded; but in my construction there is no vacant space, and some part of the knives is bound to reach and cut the stalks. The operation of these knives is plainly shown in Fig. 10, where I have shown several rows of stalks in the act of being shredded.

E designates the top of the casing in front of the snapping-rolls, which is also used as the feed-board for the snapping-rolls. This top extends from a point beyond the front end of the casing to nearly the snapping-rolls. The front part of this top E is provided with a hinge-door E' , which is secured in place by means of the hinges E'' . This hinge-door extends from the front of the frame to an aperture located about the central portion of the top and is wide enough to allow the operator to pass through the opening to the aperture when the door is raised. Below the top of the casing and above the husking-rolls is positioned a platform F , which supports the operator or operators when in the act of feeding the snapping-rolls. This platform extends in the frame far enough to be under the aperture in the casing.

F' designates side feed or guide boards, which are hinged to the side of the casing by means of the hinges F'' and are adapted to be folded over when the machine is being transported from place to place. The platform F is provided with the vertical foot-board F''' at its rear end to prevent the operator's feet from reaching the husking-rolls. The aperture in the top of the casing is wide enough to allow the presence of two operators; but if only one operator is feeding the aperture can be made smaller by means of the flap-doors e on opposite sides of the aperture, which can be raised and held in place by means of the buttons e' , making just room enough for one operator, and thereby preventing any stalks from falling upon the plat-

form F . It will be noticed that the operator is located near the longitudinal center of the machine and a sufficient distance from the snapping-rolls so that it would be impossible for the operator in feeding to have his hand caught between the rolls. It will also be seen that the stalks can be fed to the feed-board from either side of the machine or both sides at one time and that two feeders can be employed. The stalks are fed butt-end first, and the rolls being spaced apart and revolving at a high speed will carry the stalks through as fast as they can be fed.

F'''' designates a guide-board extending from above the frame to a point adjacent the space between the snapping-rolls. The top of the frame is cut away, as shown at f , to allow the ears to fall into the husking-rolls and are further directed by means of the guide-boards f' and f'' .

G designates the husking-rolls. By referring to Fig. 6 it will be seen that I show eight of these rolls arranged side by side; but it is evident that any suitable number could be used when desired. These rolls are placed at an angle in the machine and are journaled in the cross-pieces G' . These rolls are rigidly journaled close together, and their upper ends are provided with meshing pinions G'' . Two or more of the rolls are provided with bevel gear-wheels G''' , which mesh with bevel gear-wheels g on the shaft g' , which extends across and to the outside of the frame. Motion is imparted to this shaft by means of the pulley 4.

It will be seen that by gearing the rolls together by means of the pinions they will revolve in pairs, one roll of each pair revolving in opposite directions. One roll of each pair is provided with a series of longitudinal slots J , about the length of an ordinary ear of corn, and the other roll with a series of pins J' , arranged in sets, preferably three in each set, adapted when the rolls revolve to enter the groove in the other roll. The grooves and pins are arranged on opposite sides of the rolls, as plainly shown in Fig. 8, but not in a diagonal line across. As shown in said Fig. 8, the portion directly across from the groove is smooth and the portion directly across from the groove shown in dotted lines will also be smooth. The pins in the adjacent roll are similarly arranged. Above the rolls are the guide-strips H . These strips are triangular in cross-section, the point being at the top, and will guide the ears to the pair of oppositely-revolving rolls.

H' designates guide-strips on the sides of the casing to further guide the ears to the rolls. The husking-rolls, like the snapping-rolls, are mounted in rigid bearings, but revolve at a less rate of speed. When the ears fall onto the rolls they will naturally fall into the grooves and be held there while the pins will pull off the husks, allowing the husks to fall through and the ears to pass down onto the rattler I . By providing one of the rolls with the grooves, the ears fall therein,

and are prevented from slipping or moving away from the pins, while the pins are grasping the husks, so that the husks will always be entirely removed. The grooves will also have a tendency to turn the ears over. The ears are carried from the rattler by any suitable conveyer. (Not shown.)

N N' designate flexible aprons for protecting the gearing for running the husking-rolls. During the process of snapping the ears from the stalks and the husks from the ears I find by experience it sometimes happens that some grains of corn will become detached from the ears. With that purpose in view I place under the snapping-rolls and shredding-knives a vibrator S. By referring to Fig. 11 it will be seen that the vibrator has the wooden sides and bottom S'. On top of the vibrator are a series of transverse strips S'', which are adapted to hold the shredded stalks and allow the grains to fall down on the bottom when the vibrator is agitated, as hereinafter described. To prevent any of the shredded stalks which might lie transversely on the vibrator from falling, I place under the strips S'' longitudinal strips s. The vibrator has a downwardly-extending portion and a horizontal portion, as plainly shown in Fig. 2. At or about the point where the horizontal portion commences the bottom S' is provided with an opening s', which allows the grains of corn and whatever chaff there is with the corn to fall downward onto the vibrator T.

The vibrator T is hung below the husking-rolls by means of the links t, which are pivoted to the vibrator and sides of the casing, while the vibrator S has one end supported by means of a pin V, extending from the sides of the casing, engaging a slot V' on the side of the vibrator, and the other end supported by means of the link Y, having its upper end pivoted to the casing at y and its lower end pivoted to the vibrator at y'. The vibrator T is provided with transverse strips, the same as the vibrator S. In this vibrator the strips are arranged side by side, forming a closed bottom until near the rear end, where they are spaced apart, as shown at T'. Beneath these open spaces is a bottom M'', carried by the vibrator, which leads into a trough X'.

U' designates a rock-shaft centrally pivoted to the side of the casing at U'''. The upper end of this rock-shaft is pivotally connected with a link U, which has one end pivotally connected to the vibrator and the other end pivoted to the end of a crank U''' on the end of the shaft g'. The lower end of the rock-shaft U' is pivotally connected to a link U'', which in turn has its opposite end pivotally connected to the vibrator T. All of this construction is plainly shown in Fig. 2. It will plainly be seen from this construction that when the machine is set in motion the two vibrators will oscillate by means of the rock-shaft U' and connections and have a constant

tendency to throw the loose grains toward the rear of the machine.

Below the vibrator T is positioned a fan-casing W, which has an opening W'' extending in the direction of the rear of the machine and in a line substantially parallel with the bottom of the vibrator. Within this casing is a fan W', mounted on a shaft W'''. The shaft and fan are driven by the pulley 7.

Located in the trough X is a screw conveyer X', mounted on a shaft X''. The conveyer is to convey the corn to the outside of the casing and is actuated by the pulley 8.

M M' designate deflectors to deflect and guide the shredded stalks and husks to the opening L'' in the fan-casing L. K designates the fan within this casing, which is revolved by any suitable mechanism, that which is shown consisting of a short shaft K', on which the fan is mounted, a bevel gear-wheel K'' on the shaft meshing with a bevel-gear (not shown) on the shaft K'''.

The fan-casing L, as before described, is set at an incline in the casing and is provided with a spout L' on one side of the center, as shown in Fig. 9. The opening L'' in the top of the main casing is oblong across the frame, thereby allowing a greater opening for the shredded stalks and husks to fall into the fan-casing and at the same time not destroy the draft. The fan-casing is positioned directly below the rear ends of the vibrators, so that the shredded stalks and husks will have a direct fall into the fan-casing. By making the opening in the casing oblong transversely across the machine all the fodder and husks will fall into the casing; but the force of the suction will not be diminished. It will also be noticed that there will always be an abundance of air, for the reason that the front of the casing is open and the sides and rear closed, thereby making a strong draft when the fan is running.

In the operation of the machine, as before described, the stalks after having the ears snapped off are shredded by the knives D'' and fall onto the vibrator S. Any loose corn will fall onto the bottom S' and out through the opening s' onto the open portion T' of the vibrator, then onto the bottom M'' to the trough and conveyer X', while all chaff will be removed by the fan W'. In the meanwhile the shredded stalks will fall over the rear end of the vibrator S into the fan-casing and be removed through the opening L' by the fan. The husks after being removed from the ears will fall onto the vibrator T and work their way up and fall off the rear end into the fan-casing and be removed, as hereinbefore described. If there is any loose corn, it will fall through the open portion onto the bottom M'' and also be conveyed to the outside of the casing, as before described.

O designates a belt for running the different parts of the machine. This belt is connected

to an engine or other suitable source of power (not shown) and moves in the direction of the arrows shown in Fig. 1. The belt first passes around the pulley 7, running the fan 5 W', then around the pulley 8, running the conveyer, then around the pulley 2, running the fan K, then in an upwardly direction around the pulley 3, running the shredding-knives, then in a downwardly direction around 10 the pulley 4, running the husking-rolls and vibrators, and then upwardly again around the pulley 5, running the snapping-rolls, and then downwardly around the idler 6 back to the engine.

15 R designates a belt-fastener on which the idler is journaled. By this arrangement it will be seen that a single belt actuates the principal parts of the machine and that the various pulleys and idlers are arranged for 20 this purpose.

I am aware that many minor changes can be made in the construction and arrangement of parts without in the least departing from the nature and principles of my invention.

25 Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination substantially as described, a pair of snapping-rolls bearing a

fixed relation relative to each other, means 30 for operating said rolls, and correspondingly-located ribs and grooves on the rollers each comprising longitudinally-disposed portions arranged out of alinement and inclined intermediate portions connecting said longitudinal 35 portions.

2. In combination substantially as described, a series of husking-rolls located side by side, means for operating said rolls, and each alternate roll being provided with a series of separated grooves of a length substantially that of an ear of corn all grooves of the series being arranged in alinement longitudinally of the roll, and each intermediate roll being provided with a plurality of separated 45 series of projecting pins also arranged in alinement longitudinally of the roll and adapted as the roll revolves to engage the corn seated in the grooves of the adjacent roll, and guides H arranged to feed the corn to a point 50 between each pair of rolls.

In testimony whereof I have hereunto set my hand in the presence of two witnesses.

J. KURT SMITH.

Witnesses:

CHARLES H. RIFE,
FRANK E. HOOVER.