

S. BUFKIN.

BAND CUTTER AND FEEDER.

(Application filed Oct. 7, 1897.)

(No Model.)

4 Sheets—Sheet 1.

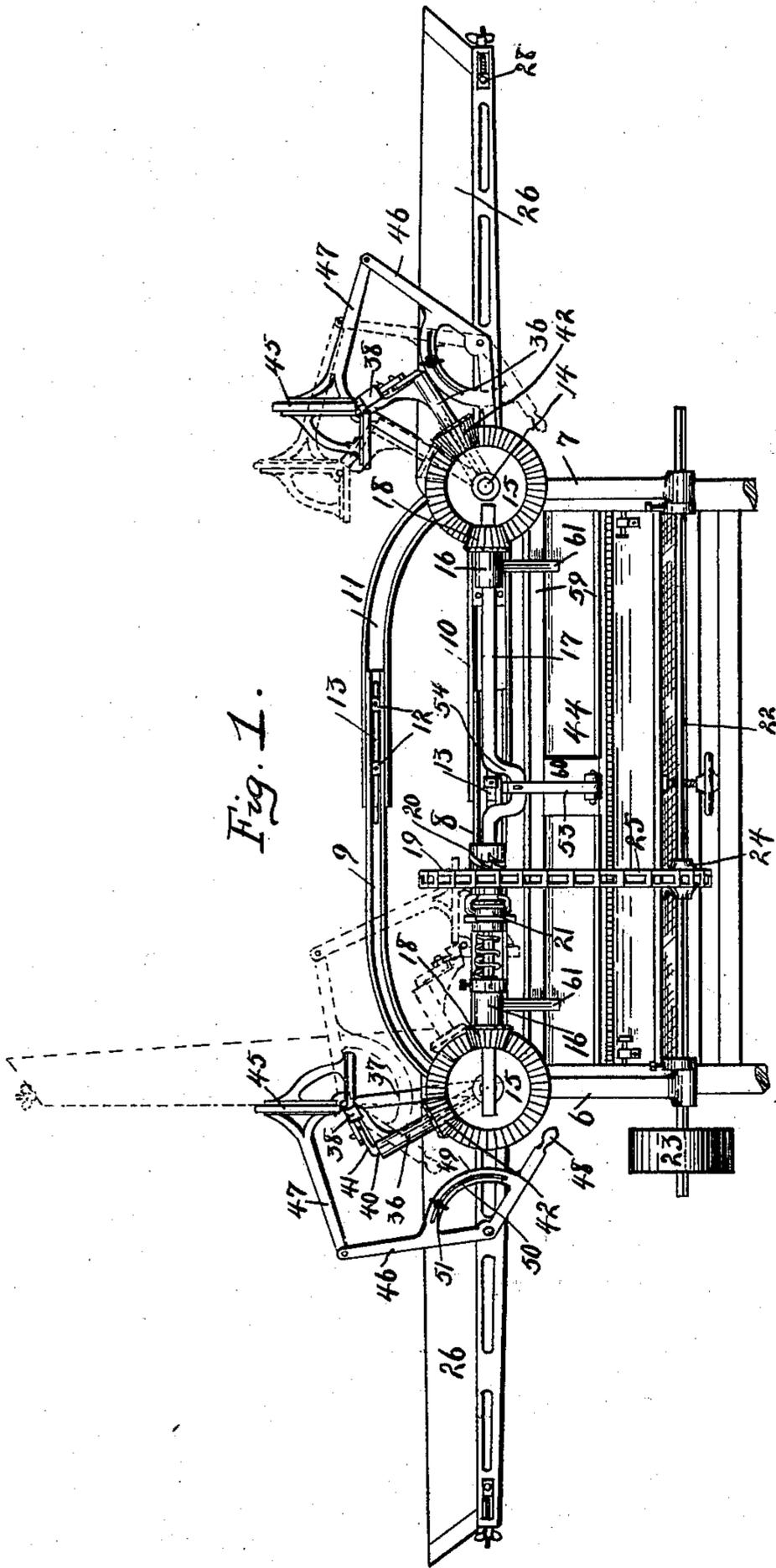


Fig. 1.

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No. 671,581.

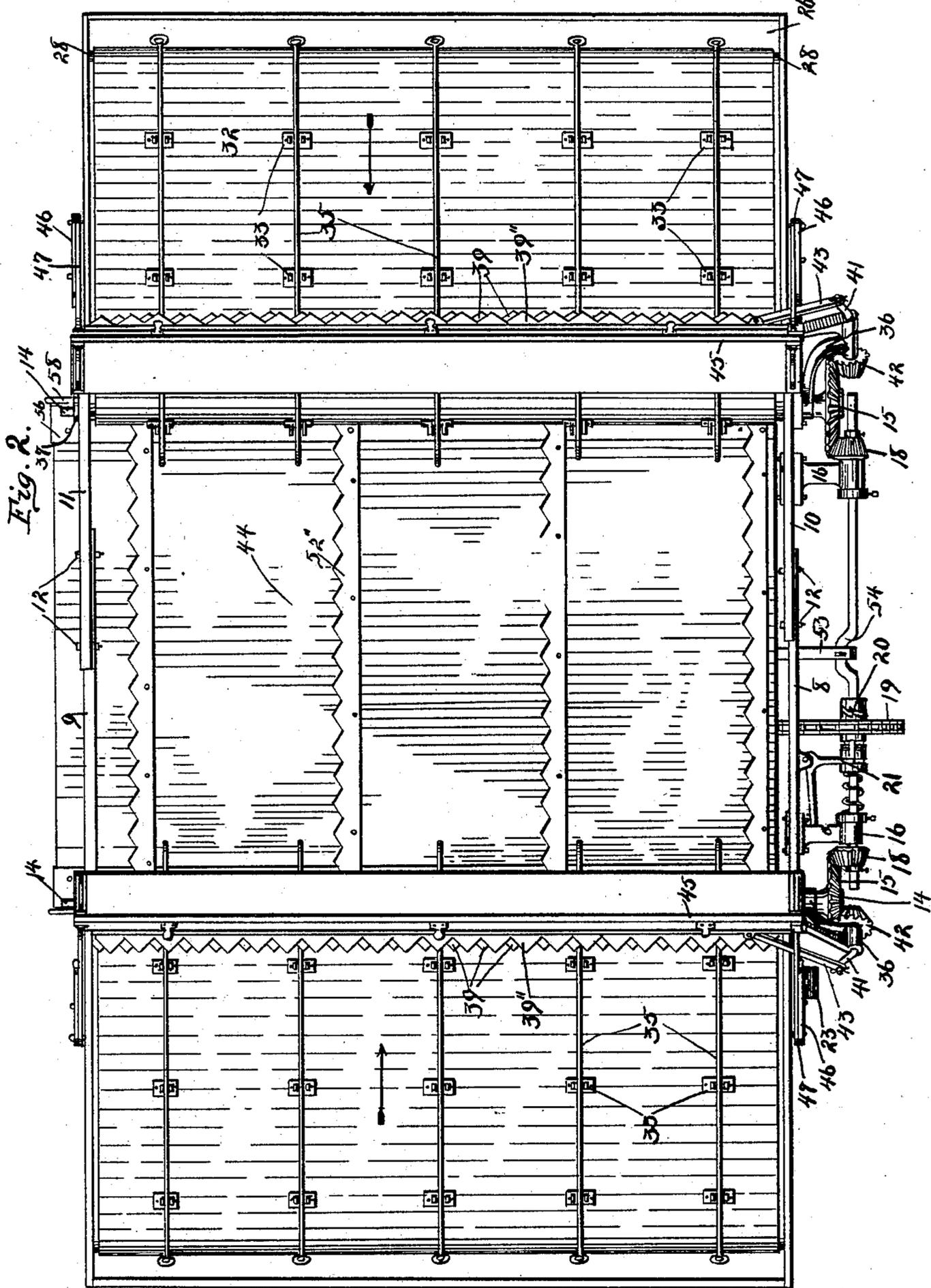
Patented Apr. 9, 1901.

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4 Sheets—Sheet 2.



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4 Sheets—Sheet 3.

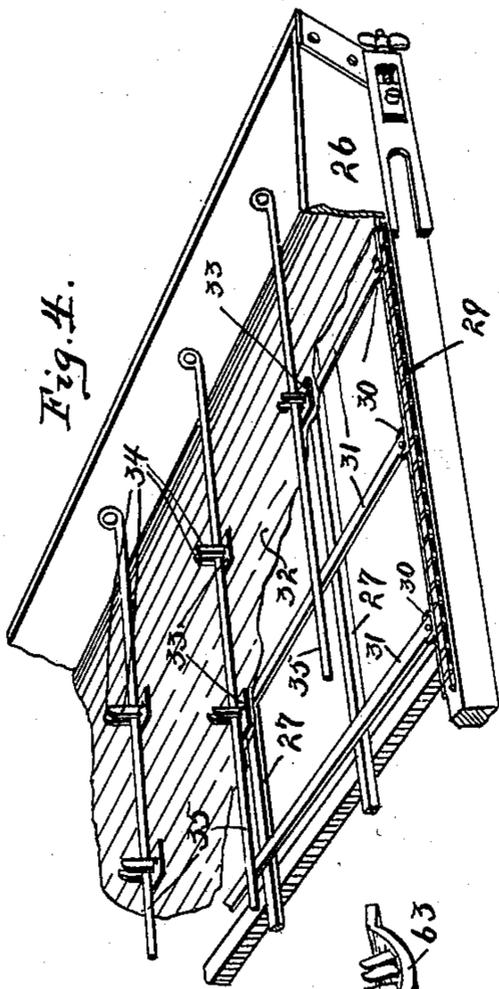


Fig. 4.

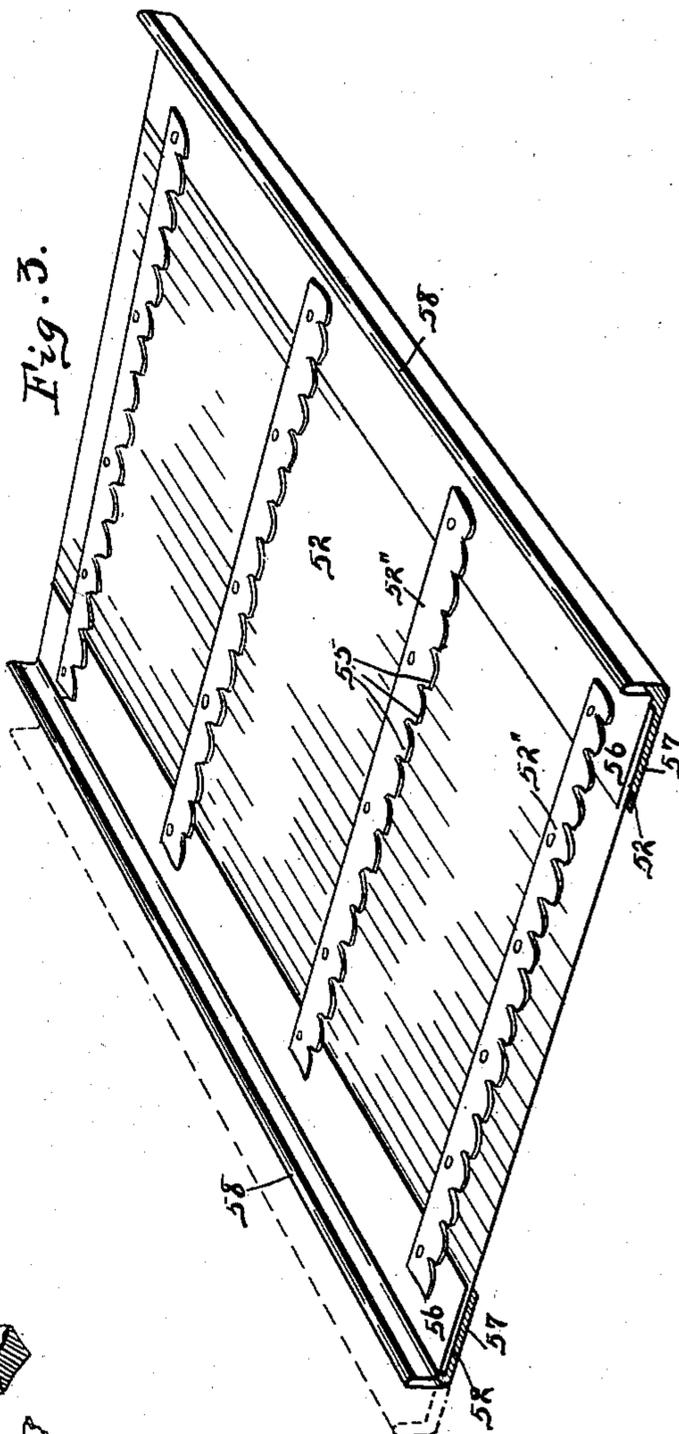


Fig. 5.

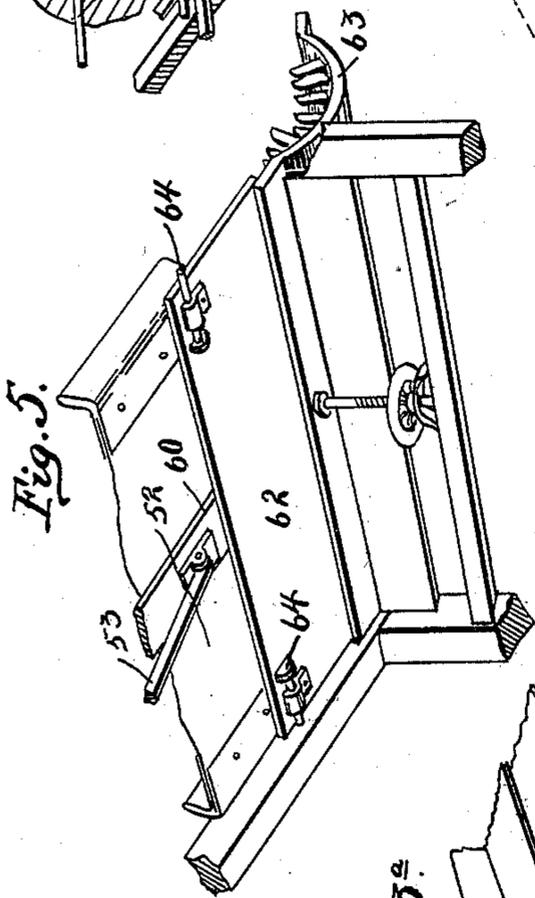


Fig. 6.

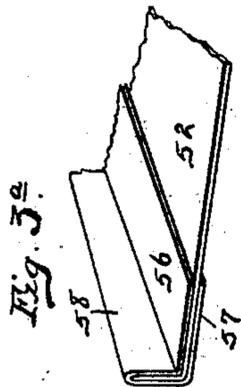


Fig. 7.

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4 Sheets—Sheet 4.

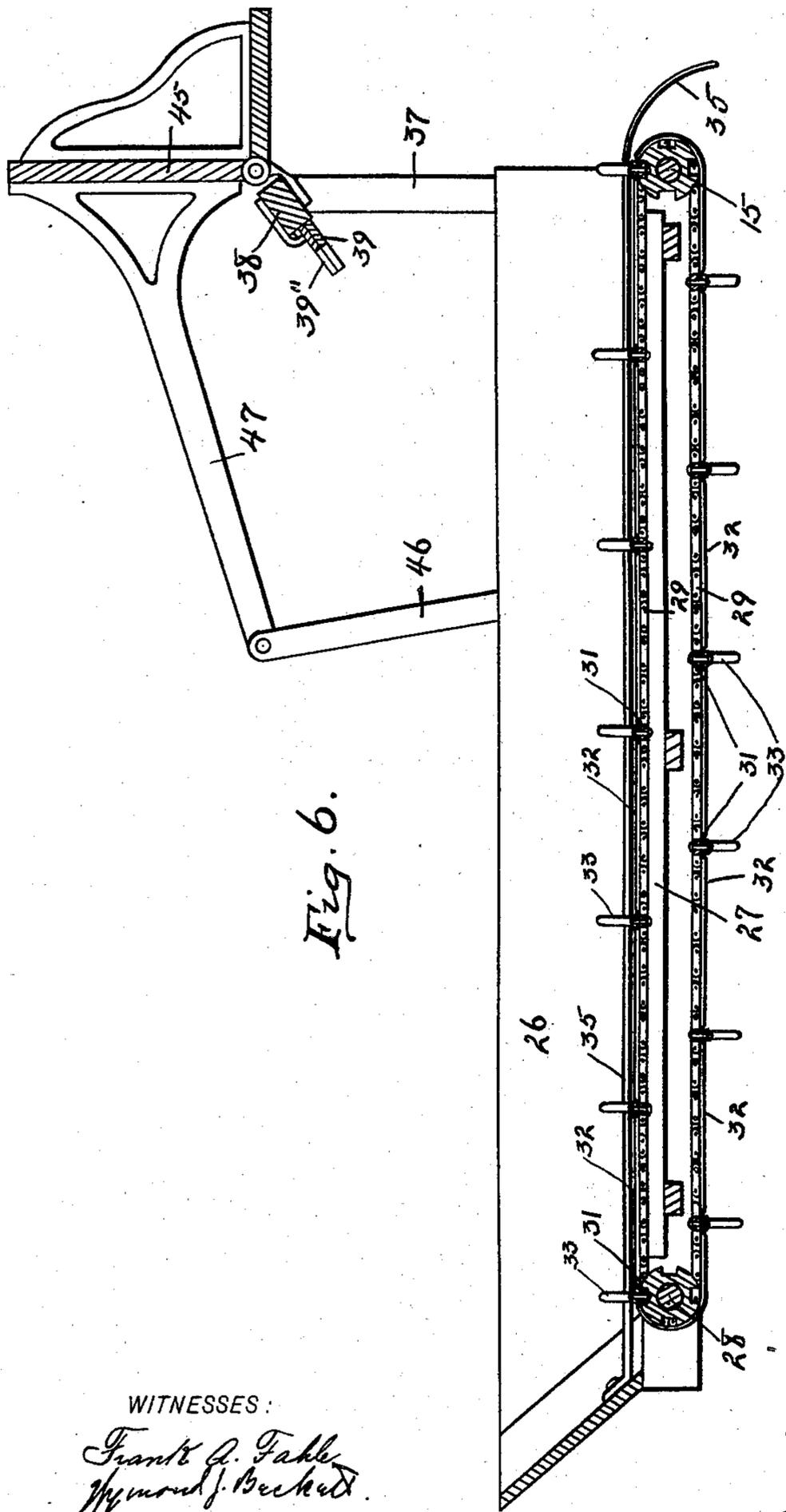


Fig. 6.

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UNITED STATES PATENT OFFICE.

SAMUEL BUFKIN, OF INDIANAPOLIS, INDIANA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE NATIONAL MACHINE COMPANY, OF COLUMBUS, INDIANA.

BAND-CUTTER AND FEEDER.

SPECIFICATION forming part of Letters Patent No. 671,581, dated April 9, 1901.

Application filed October 7, 1897. Serial No. 654,331. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL BUFKIN, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Band-Cutter and Feeder, of which the following is a specification.

My invention relates to an improvement in band-cutters and feeders.

10 The objects of my invention are to produce a cutter and feeder which may be easily attached to various makes of separators; to provide means for regulating the quantity of material passing to the separating-cylinder and concave; to provide means for preventing the material from becoming choked on the feeder-tables; to provide an improved form of carrying-belt for the feeder-tables; to provide an improved feeder-table construction; to provide an improved form of shaker-table which may be easily made to fit any separator; to provide means by which the operator may easily reach the separating-cylinder and concave; to provide means by which the cutter and feeder may be arranged to be easily transported without disturbing its position on the separator, and to provide such other improvements as shall hereinafter be pointed out.

30 The accompanying drawings illustrate my invention.

Figure 1 is an end elevation thereof. Fig. 2 is a plan. Fig. 3 is a perspective view of the shaker-table. Fig. 3^a is a detail, on a larger scale, of a portion of the table 52. Fig. 4 is a detail of one of the feeder-tables and the belt forming a part thereof. Fig. 5 is a detail of the means for allowing access to the separating-cylinder and concave. Fig. 6 is a transverse vertical section on a plane parallel with shaft 17.

In the drawings, 6 and 7 indicate a pair of frames adapted to rest upon the sides of a separator. Frame 6 is provided with a pair of inwardly-extending transverse arms 8 and 9, and frame 7 is provided with a similar pair of arms 10 and 11. The inner ends of arms 8 and 10 and arms 9 and 11 are adjustably secured together by means of bolts 12, passing through slots 13, so that the frames may

be adjusted to the width of the separator to which my device is to be attached.

Mounted in suitable bearings in each of frames 6 and 7 is a longitudinal shaft 14, upon one end of which is secured a gear 15. Mounted upon each of arms 8 and 10 is a standard 16, in the outer end of which is formed a suitable bearing, in which is journaled a transverse shaft 17, upon which is adjustably secured a pair of gears 18, each adapted to mesh with one of gears 15. For the purpose of driving shaft 17 I mount upon said shaft a loose sprocket-wheel 19, suitable clutch mechanism 20, and clutch-operating mechanism 21, by means of which the sprocket 19 may be brought into or out of driven engagement with the shaft 17. Mounted in suitable bearings in frames 6 and 7 is a second transverse shaft 22, provided with a driving-pulley 23 and a sprocket 24, a chain 25 being passed over said sprocket and the sprocket 19. Pivotaly mounted upon each of shafts 14 is a frame 26, which forms the foundation for the feed-table. Frame 26 is provided with a series of longitudinal bars 27, the purpose of which will appear. Mounted near the outer end of each of frames 26 is a shaft 28, upon which is mounted a pair of sprocket-wheels, over which and similar sprocket-wheels carried by shaft 14 are passed endless chain or link belts 29. Belt 29 is composed of the usual links; but several of the links of each chain are provided with projecting ears 30, to which are secured the ends of bars 31, which extend between and connect the two belts. Mounted upon each of shafts 14 and 28 is a roller, over which is passed a covering 32, of canvas or other suitable flexible material. Covering 32 is secured to the bars 31 by means of a series of pronged drags 33, the said drags being mounted upon the canvas and rivets passed through the base of the drags, the canvas, and the bars 31, the said drags being so placed as to lie immediately above the longitudinal bars 27. The drags 33 are arranged in rows along the endless belt, and each is provided with a pair of upright ears 34, which straddle one of a series of spring stripper-bars 35, the outer ends of which are secured to the outer side of frame 26, and the

inner ends of which are extended slightly beyond the inner end of the belt and bent downward. By the above-described arrangement the canvas covering is divided into a number
 5 of short sections, each of said sections being supported between two of the bars 31, the covering as a whole being positively driven by means of the endless link belts and the connecting-bars 31, so that there is no stress upon the
 10 canvas, it merely serving to prevent the short grain from falling through the table. By this construction the canvas is free to shrink or stretch without affecting the tightness of the belt as a whole. The grain is supported
 15 by the stripper-bars, bars 35, and the longitudinal bars 27 of the frame 26 and is positively driven forward by the drags 33. Pivotally mounted upon each of shafts 14 at the forward and rear ends, respectively, are arms
 20 36 and 37, the upper ends of which are connected by a bar 38, upon which is mounted a series of cutters 39, adapted to cooperate with a reciprocating cutter 39', which is mounted in suitable guides thereon. Passing through
 25 arms 36, at right angles to shaft 14, is a short shaft 40, the upper end of which is formed into a crank 41 and to the lower end of which is secured a gear 42, which meshes with gear 15, the arrangement being such that arms 36 and 37 may be swung around
 30 shaft 14, gear 42 remaining constantly in mesh with gear 15. Crank 41 is connected with the reciprocating cutter by means of a pitman 43. By mounting the cutter upon the outer ends of arms 36 and 37 and pivoting the said arms upon shaft 14 the height of the cutter from the feed-table may be regulated, thus regulating the depth or amount of material which shall pass at any given time
 40 to the shaker-table 44, which leads to the separator.

It is to be borne in mind that the object of the cutters is primarily to divide the bundles of grain, whether the said grain has been
 45 bound into positive bundles and tied with cord or not, so that only a certain definite portion of the grain is allowed to pass at any given time beneath the cutters and onto the vibrating table, which leads to the separator-cylinder. It is true that the cutters also operate to sever the bundle-bands; but this is only a minor function.

In order to prevent any grain from passing over the top of the cutter, I hinge upon bar
 55 38 a guard-board 45, which projects upward a sufficient distance to form a dam for the grain.

In operation the cutters part the grain of the bundle, and in order to allow the surplus to pass freely downward and beneath the cutter the guard 45 must be maintained in a substantially vertical position in whatever position the cutters are placed. In order to automatically maintain the guard 45 in this
 60 position in all positions of the cutter, I pivot at each end of frame 26 an arm 46, the upper end of each of which is pivotally connected

with the outer end of one of a pair of arms 47, mounted one at each end of the guard 45. For the purpose of adjusting the height of
 70 the cutters one end of arms 46 may be provided with a suitable handle 48 and with a segment 49, provided with a slot 50, through which may be passed a thumb-screw 51, which enters a portion of frame 26 and by means of
 75 which the arm 46 may be held in any desired position.

For the purpose of receiving the grain as it passes from the endless belts of the feed-tables and for feeding the same to the separator-cylinder and concave I provide an inclined vibrating table 44, which may be vibrated by means of a pitman 53, pivoted at one end near the lower end of the table and at the other end connected with a crank 54,
 80 formed in shaft 17. Table 44 may be of any desired form; but I prefer to make the said table in the following manner in order that it may be easily adjusted in width to fit any make of separator. My table 44 consists,
 85 first, of a flat sheet of metal 52, to the upper face of which are riveted several transverse strips 52', provided upon their lower edges with a series of slightly-upturned teeth 55. The ends of strips 52' are left free, for a purpose
 90 which will appear. Mounted upon both side edges of plate 52 is a side piece, which consists of a doubled strip of metal forming a pair of lips 56 and 57, between which the edge of sheet 52 may be inserted, lip 56 being
 95 also inserted beneath the free ends of strips 54. In order to form sides for the table and at the same time to stiffen the edges thereof, the doubled strip is bent upward at the doubled edge to form an upright portion 58.
 100 The table thus formed is supported by an I-shaped frame consisting of cross-pieces and the longitudinal connecting-piece 60. In this construction the side pieces of the table are not riveted in position until the device is fitted
 105 to a separator, at which time the width of the table is determined, the edges of plate 52 inserted between lips 56 and 57 the required distance, and rivet-holes punched and rivets inserted through the free end of strips 52',
 110 lips 56 and 57, and plate 52. It will be understood, of course, that the side piece just described may be placed upon both edges of plate 52 or upon a single edge thereof.

It is often desirable to be able to easily and quickly reach the separator-cylinder and concave without removing or disturbing the cutter and feeder. For this purpose the upper end of the table 44 is supported upon a pair of fingers 61 61, carried one by each of arms
 120 8 and 10 of frames 6 and 7. The lower end of said table is then supported upon a transverse board 62, the inner lower edge of which is supported upon the concave 63 or upon any other suitable ledge and the upper outer edge
 125 thereof held in position by means of a pair of catches 64, the ends of which are inserted in holes formed in the frame of the separator. By this arrangement the board 62 may be

easily removed by withdrawing catches 64. The lower end of table 44 will then drop, thus leaving a clear opening into the separator-casing immediately in front of the cylinder and concave.

The operation is as follows: In order to mount the device upon the separator, the usual feed-tables are removed, and the distance between the shafts 14 is regulated by means of bolts 12, so that the frames 6 and 7 are secured together in position to fit upon the separator-casing. Table 44 is then adjusted in width, as previously described. Pulley 23 is then connected with any suitable source of power, the arrangement being such that the endless belts 32 will be driven in the directions indicated by the arrows thereon. The bundles of grain are then thrown upon the belts 32, the weight of the bundles being supported first by bars 35 and through them by the bars 31 of the belt and bars 27 of the frame, the covering of canvas being loose and merely operating to prevent the short grain from falling through. As the belts 32 advance the bundle is carried forward until it is brought into engagement with the cutters 39 39", by which it is separated, the cutters also operating to sever the band if the material has been bound into bundles. The grain then spreads out upon the belt, and the lower portion thereof—*i. e.*, that portion below the cutters—is moved positively forward by the drags 33 and is carried over the inner ends of the stripper-bars 35 and deposited upon table 44, which feeds it downward to the separator-cylinder. All of the grain which happens to lie above the cutters is first brought into contact with the guard 45 and by that is retained until the lower portion has passed forward. Then the surplus is allowed to fall and be carried forward by the belt. It is desirable that the guard 45 be substantially vertical, for the reason that if it be inclined toward the center of the machine the grain is liable to crawl over and does not quickly fall upon the belt, while if the guard be inclined toward the feed-table the surplus grain will become choked between the guard and cutters, so that it will both impede the operation of the cutters and will be prevented from falling quickly to the table and passing beneath the cutters. In order to regulate the amount of grain passing to the shaker-table, the operator loosens screw 51, grasps handle 48, and by swinging arms 46 causes guard 45, together with the cutters 39 39", bar 38, arms 36 and 37, shaft 40, and gear 42, to swing about the shaft 14 as a center. It will be noticed in this connection that as the cutters are lowered they are advanced toward the outer edge of the feed-table, so that the available area thereof is diminished, while as the cutters are raised they recede from the outer edge of the table, so that the available area thereof is increased. By this arrangement also the driving-gears remain constantly in engagement with each

other and the guard 45 is maintained in a substantially vertical position.

In band-cutters and feeders heretofore produced, owing to the fact that they are considerably wider than the separator to which they are attached, it is necessary to change the position of the feeder before the separator may be moved from one field to another, the general habit being to lift the entire mechanism from the separator and, swinging it around, place it lengthwise upon the top of the separator-casing. In the present construction in order to prepare the machine for transportation the cutters are lowered to their lowest position, and then the entire frame 26, being pivoted upon shaft 14, as is the cutting mechanism, may be swung up into the position shown in dotted lines at the left of Fig. 1, the width of the cutter and feeder being then substantially the same as the separator. Again, in preparing the device for shipment before it has been attached to a separator the frames 26 may be folded up, as described, so that it occupies a minimum amount of space.

I claim as my invention—

1. In a band-cutter and feeder, the combination with a pair of feed-tables, means for moving the grain upon said tables toward the center, and an intermediate adjustable connecting-framework between the two tables whereby the distance between said tables may be regulated and the device thereby made to fit any width separator.

2. In a band-cutter and feeder, a frame, a shaft mounted in said frame, a feed-table pivotally mounted upon the shaft, a pair of arms also pivotally mounted on the shaft, a reciprocating cutter carried by the outer ends of said arms above the feed-table, intermediate connecting mechanism between the shaft and cutter, and means for swinging said cutter about the shaft and rigidly holding it at any desired distance from the feed-table, whereby the amount of material passing from the feed-table may be regulated.

3. In a band-cutter and feeder, a frame, a shaft mounted in said frame, a feed-table pivotally mounted upon said shaft, an endless-belt carrier mounted in said feed-table and passing around said shaft, a pair of arms also pivotally mounted on the shaft, a reciprocating cutter carried by the outer ends of said arms above the feed-table, intermediate connecting mechanism between the shaft and cutter, and means for swinging said cutter about the shaft and rigidly holding it at any desired distance from the feed-table whereby the amount of material passing from the feed-table may be regulated.

4. In a band-cutter and feeder, a frame, a shaft mounted in said frame, a feed-table, a pair of arms pivotally mounted upon the shaft, a cutter carried at the outer ends of said arms above the table, a guard hinged at the outer ends of said arms, a pair of arms secured to

said guard, a pair of arms pivoted to the feed-table and pivotally connected, at their upper ends, with the first-mentioned arms, and means for swinging the second arms and maintaining them in any desired position, whereby the cutter may be swung about the shaft and the guard maintained in a substantially vertical position.

5. In a band-cutter and feeder, a frame, a shaft mounted in said frame, a feed-table pivoted upon said shaft, a pair of arms pivotally mounted upon the shaft, a cutter carried at the outer ends of said arms above the feed-table, a guard hinged at the outer ends of the arms, a pair of arms secured to said guard, a pair of arms pivoted to the feed-table and pivotally connected, at their upper ends, with the first-mentioned arms, and means for swinging the second arms and maintaining them in any desired position, whereby the cutter may be swung about the shaft and the guard maintained in a substantially vertical position.

6. In a band-cutter and feeder, a feed-table therefor consisting of a frame, a pair of longitudinal shafts mounted one at each side of said frame, a pair of endless link belts connecting said shafts, a series of bars secured to and connecting said belts, a flexible covering mounted upon and secured only to said bars, a series of bifurcated drags secured to the said bars through the covering, thus holding the covering in position, and a series of

stripper-bars secured at one end to one side of the frame and projecting over the endless belt between the fingers of the drags, substantially as described.

7. A feed-table consisting of a plate, and an adjustable side therefor consisting of a doubled strip between the lips of which one edge of said plate may be inserted, the said strip being bent upward, at its doubled edge, to form the side of said feed-table, substantially as described.

8. A feed-table consisting of a plate, a series of transverse strips secured thereto, and an adjustable side consisting of a doubled strip between the lips of which the edge of said plate may be inserted, the said strip being bent upward at its doubled edge to form a side of said feed-table, substantially as described.

9. In a band-cutter and feeder, the combination with a pair of feed-tables arranged to deliver toward each other, of a pair of arms extending from the adjacent sides of each of said tables, and means for adjustably securing said arms together whereby the tables may be held at any desired distance apart and thereby caused to fit any separator, substantially as described.

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