(No Model.) 2 Sheets—Sheet 1.

J. T. SMITH.

FLAX OR HEMP BRAKE.

No. 494,174. Patented Mar. 28, 1893.

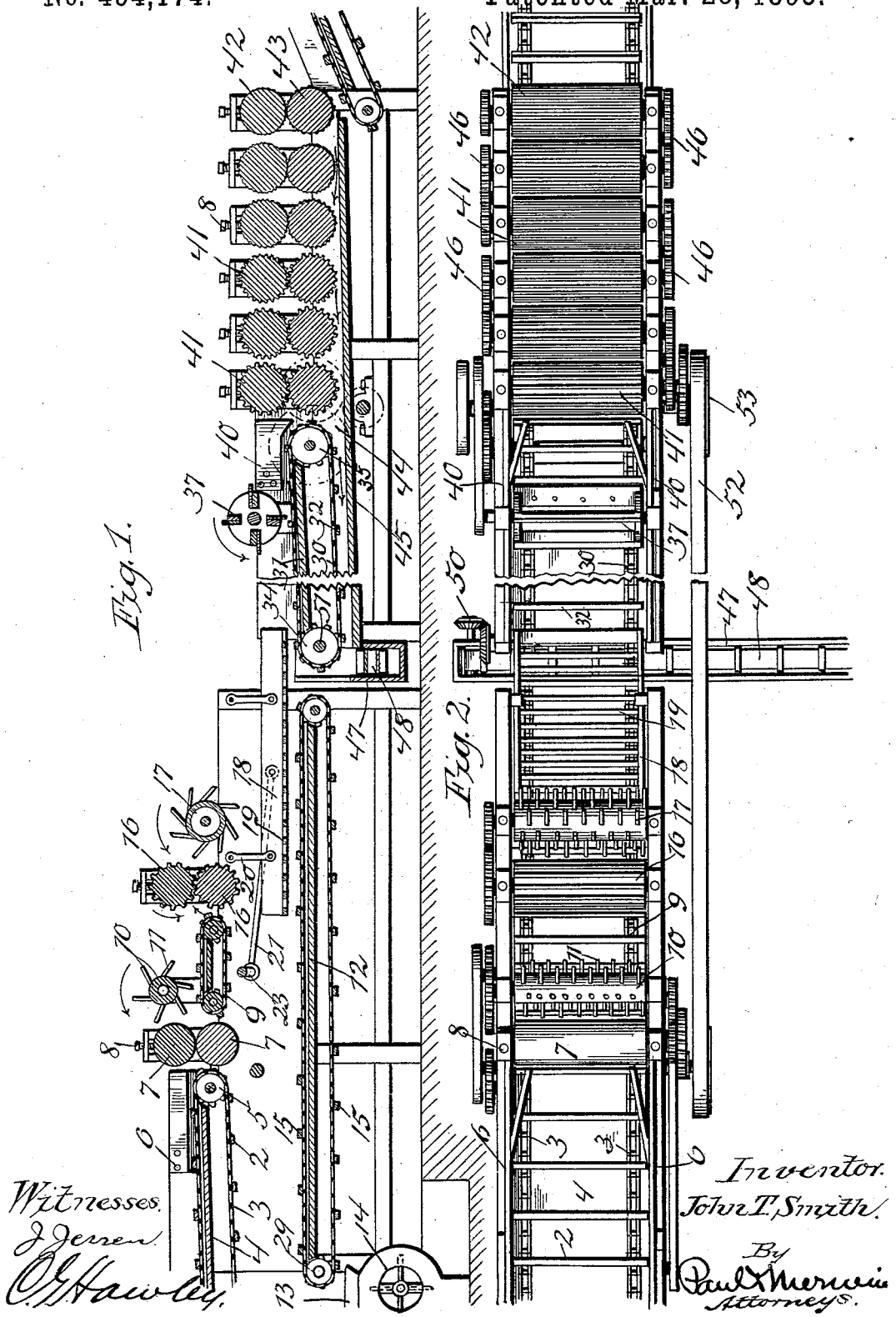

Fig. 1.

Fig. 2.

Witnesses.
J. Jerren
C. F. Hawley.

Inventor.
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By
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(No Model.) 2 Sheets—Sheet 2.

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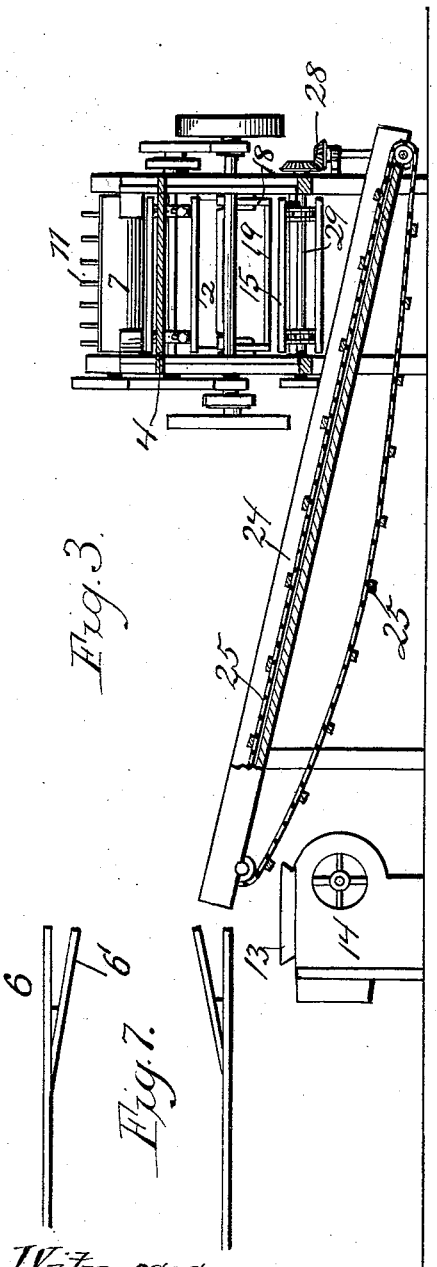

Fig. 3.

Fig. 7.

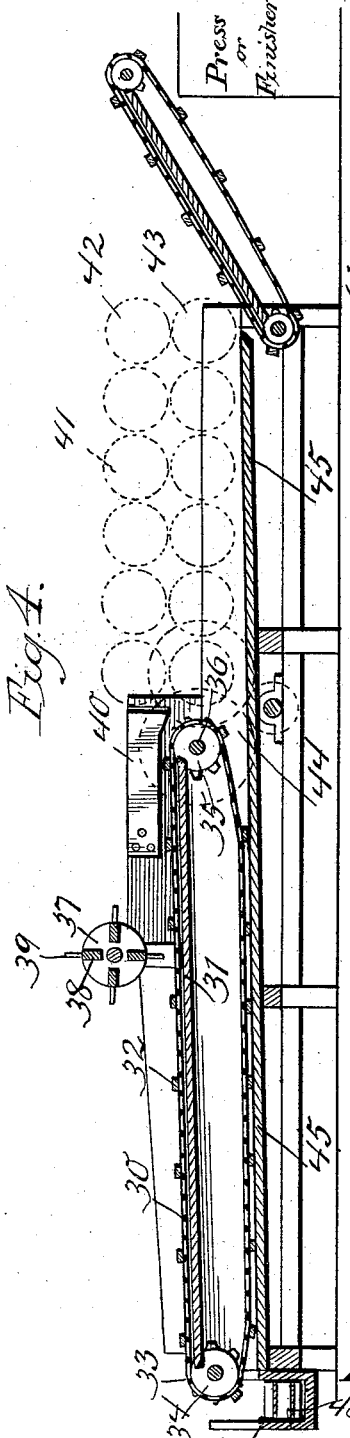

Fig. 4.

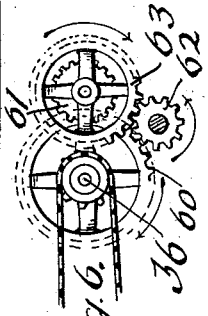

Fig. 6.

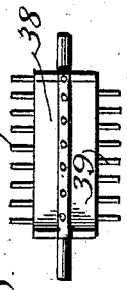

Fig. 5.

Witnesses
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Inventor.
John T. Smith
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UNITED STATES PATENT OFFICE.

JOHN T. SMITH, OF HERON LAKE, MINNESOTA.

FLAX OR HEMP BRAKE.

SPECIFICATION forming part of Letters Patent No. 494,174, dated March 28, 1893.

Application filed April 23, 1892. Serial No. 430,413. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. SMITH, of Heron Lake, Jackson county, Minnesota, have invented certain Improvements in Flax or Hemp Brakes, (Case No. 2,) of which the following is a specification.

My invention relates to a machine for thrashing flax or for preparing tow or fiber from the crude flax or hemp, and my invention relates especially to improvements upon the machine described and claimed in my patent No. 475,819, granted May 31, 1892.

The object of my invention is to provide a machine of the fewest possible parts so placed with respect to one another as to accomplish every purpose for which such machines are intended.

To this end my invention consists in a thrashing and braking machine particularly adapted for the work described and of the construction hereinafter described and particularly pointed out in the claims.

The invention will be more readily understood by reference to the accompanying drawings in which:—

Figure 1 is a longitudinal and sectional elevation of a machine embodying my invention. Fig. 2 is a plan view thereof. Fig. 3 is a transverse section showing the fanning mill of the thrasher arranged in another position. Fig. 4 is a longitudinal section of the brake portion of my machine and showing in full those parts which are broken away in Fig. 1. Fig. 5 is a detail of the beater. Figs. 6 and 7 are detailed views of the conveyer and side boards respectively.

The operation and construction of my machine are as follows:—The flax to be thrashed is thrown directly from the wagon upon the long conveyer at the receiving end of the machine. This conveyer is made up of the cross slats 2 having their ends secured upon the longitudinal link belt chain 3, and operating over the table 4. The conveyer is driven by the sprocket wheel 5. As the stock advances on the conveyer it is drawn into the middle thereof by the side boards or guides 6 having the parts 6′ converging inward toward one another and toward the pair of smooth rolls 7. The high side boards prevent the wind from blowing the stock off the carrier. The faces of these rolls are adjusted toward or from each other by the screw 8, and as the stock passes through the same the flax bolls are broken or crushed to allow the flax seed to fall out. As the stock passes between the smooth rolls it is received upon the short open conveyer 9, whereupon it is thrown and scattered by the rapidly revolving doffer 10 having a large number of the backwardly inclined teeth 11. The doffer and the conveyer scatter and loosen up the straw and shake out a large portion of the flax seed which falls upon the long table 12 arranged beneath the same in the bottom of the machine. The seed is carried off of the table and into the hopper 13 of the fanning mill 14 by the conveyer 15. After this operation the straw enters between the pair of corrugated brake rolls 16, 16 being there broken or crumpled and discharged against the still more rapidly revolving doffer 17 which forcibly throws the stock down upon the shaker 18 having the bottom made up of the open slat work 19. This shaker is hung upon the pivoted arms 20 and is reciprocated rapidly back and forth by the connecting rod 21 extending back to the crank shaft 23 which is rapidly revolved by a suitable power connection. While on the shaker all of the flax seed is shaken out from the straw upon the conveyer table 12 from whence it is carried into the fanning mill, where the flax seed is thoroughly separated from all of the short pieces of straw and the shives. The fanning mill may if desired be situated at one side of the thrashing machine and a separate spout or table 24 and conveyer 25 provided to receive the seed from the end of the conveyer 15 and carry the same in a lateral direction to the fanning mill 14. In this case the conveyer 25 is driven by a miter gear connection 28 with the sprocket shaft 29 of the conveyer 15. After thus carefully separating the seed from the flax straw the straw is thrown upon the long conveyer 30, running over the table 31 and made up of the cross slats 32 secured upon the two link belts 33 which operate upon the sprocket wheels 34 and 35 at the two ends of the belt. This conveyer is driven from the shaft 36 of the sprocket wheel 35. The shaft 36 carries a large gear wheel 60 which meshes with a smaller one 61 fixed on the shaft of the first brake roll 41 which is primarily driven by the small pinion 62 on the power shaft and

which meshes with the large gear wheel 63 on the brake roll 41. Thus the two parts are driven by a single power connection. A similar construction is employed between the conveyer or carrier 3 and the thrashing rolls 7. The conveyer 30 is about fifteen or twenty feet long and about one third back thereon and above the same I provide the rapidly revolving beater 37 made up of the cross bars 38 having a large number of straight radial teeth 39 which thoroughly shake the stock as it passes through under the beater upon the slow moving conveyer. From the beater the stock is thrown forward and dropped again upon the conveyer and between the converging sideboards or guides 40 similar to 6′ from whence the stock passes immediately into the first and coarsest pair of the series of brake rolls 41. The corrugations of these rolls become regularly finer and closer from the first and coarsest pair of rolls to the very finely corrugated rolls 42 and 43. All of these brake rolls are corrugated. The ribs or teeth of the opposite rolls do not quite touch and as the stock leaves the last pair it is finally formed into a thin flat sheet of fiber very finely roughened and is thence delivered to a final finishing machine. The greater proportion of the shives fall upon the floor 45 of trough 44 from the conveyer 30 and from between the brake rolls. The lower brake rolls revolve close down to the floor and all in the same direction by virtue of their gear connections 46 shown in Fig. 2. Hence the shives falling upon the floor are pushed back by the under sides of the rolls until they are finally thrown under the lower side of the conveyer 30 whereby they are carried into the transverse trough 47 there being collected by the belt conveyer 48 and carried off to the fuel room of the mill.

In preparing hemp the stock is thrown directly upon the conveyer 30 and put through the brake rolls only, the action being exactly the same as in breaking flax straw. I preferably drive the transverse belt 48 by means of the miter gear connection 50 between the lower shaft of the belt and the shaft 51 of the conveyer 30. When using the set of brake rolls alone the long drive belt 52 extending between the power shaft of the thrasher portion of the machines and the brake rolls is removed and in place thereof a belt attached to a drive pulley upon the opposite side of the machine or a longer belt may be passed over the pulley 53.

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

1. The combination in a machine for treating flax, of a frame having in its lower part a conveyer, with a feed conveyer projecting over the forward ends thereof, thrashing rolls arranged in advance thereof to receive the crude stock therefrom, corrugated rolls in advance of the thrashing rolls, a short conveyer arranged between the two pairs of rolls mentioned, a doffer arranged to revolve above said short conveyer, a shaker to receive the stock from the corrugated rolls and a doffer to throw the stock thereon, all substantially as and for the purpose specified.

2. The combination with a long conveyer made up of side belts and cross slats with the table 4 thereon, a power connection for operating said belt, a pair of smooth rolls arranged in advance of said conveyer to receive the stock therefrom, a pair of corrugated rolls, a short open slat conveyer arranged between the two pairs of rolls, a doffer arranged above said conveyer and operating close to the smooth rolls and at a greater speed, a trough or table arranged beneath the whole, a conveyer operating over the same to carry off the seed, and means for driving all of said parts, substantially as described.

3. The combination with the frame, of a conveyer having cross slats, a table 4, the converging side boards, the smooth rolls 7, the rapidly revolving doffer arranged in advance thereof, the short open conveyer beneath said doffer and whereon the stock is delivered from the smooth rolls, corrugated rolls, a more rapidly revolving doffer 17 to act upon the stock emerging from the corrugated rolls, a shaker 18, a floor 12 beneath all of said parts, a conveyer operating over the same to carry away the seed, and means for operating all of said parts, substantially as described.

4. The combination with a feed conveyer, of a pair of smooth rolls to receive the stock therefrom, a pair of corrugated brake rolls, a short conveyer arranged between said pairs of rolls, a shaker having cross slats 18, a crank shaft, a connecting rod or rods extending therefrom to the shaker, a rapidly revolving doffer 17 arranged to scatter the stock emerging from the corrugated rolls, and a seed receiving table and conveyer arranged beneath the whole, as and for the purpose specified.

5. The combination with a feed conveyer, of thrashing and breaking rolls arranged in advance thereof, a short conveyer and a doffer arranged between the thrashing and breaking rolls, a shaker to receive the stock from the brake rolls, a seed conveyer a long conveyer to receive the stock from said shaker, a beater operating above said conveyer to scatter the stock thereon, and to regulate the feed therefrom, and a series of diminishingly corrugated brake rolls to receive the stock from the last mentioned conveyer, and power connections for operating all of said parts, substantially as described.

6. The combination with the frame, of a floor 45 arranged therein and a second floor 31 arranged above the same, a conveyer arranged to operate upon both, a spreader and beater arranged above the upper part of the conveyer and revolving at a high rate of speed, a series of diminishingly corrugated brake rolls to receive the stock from said conveyer and from one another, a conveyer trough and conveyer 48 arranged to receive shives

falling from the end of the floor 45, the lower brake rolls being arranged to operate just above said floor and to push the shives back thereon, substantially as described.

7. The combination with the long conveyer 30, of the two floors whereon the same are adapted to operate, the cross slats and sprocket belts of said conveyer, the beater arranged above the upper floor and having the radial pins 29, the converging side boards 40 and the series of brake rolls with means for operating the same, substantially as described.

8. The combination in a machine for treating flax, of a frame provided in its lower part with a conveyer 15, a feed conveyer projecting over the outer end thereof, thrashing rolls in advance of said feed conveyer, corrugated rolls in advance of said thrashing rolls, and a shaker to receive the stock from the corrugated rolls.

9. The combination with the floor, of the long conveyer to operate upon the same, the two shafts, the sprocket wheels thereon, said conveyer made up of endless chains to run upon said wheels and the cross slats secured upon said chains, the brake rolls, the large and small gears provided upon the nearest roll, and a power pinion to engage one and a gear wheel upon one of said shafts to engage the other, substantially as described.

10. The combination with a feed conveyer, of thrashing and breaking rolls arranged in advance thereof, a shaker to receive the stock from the brake rolls, a conveyer to receive stock from said shaker, and a series of diminishingly corrugated brake rolls to receive the stock from said conveyer, and means for driving said parts, substantially as described.

11. The combination with a feed conveyer, of the thrashing and breaking rolls arranged in advance thereof, a short conveyer and a doffer arranged between the thrashing and breaking rolls, and shaker to receive the stock from the brake rolls, a conveyer to receive the stock from said shaker, and a series of corrugated brake rolls to receive the stock from said conveyer.

12. The combination in a machine of the class described, with means for thrashing and separating the seed from the flax straw, of a conveyer arranged to receive the straw, a separate conveyer arranged to receive the seed, a series of brake rolls arranged to receive the straw from its conveyer, and a fanning mill arranged to receive the seed from its conveyer.

13. The combination in a machine of the class described, with means for thrashing and separating the seed from the straw, of a conveyer arranged to receive the seed, a separate conveyer arranged to receive the straw, and a series of brake rolls arranged to receive the straw from its conveyer.

14. In a machine of the class described, the combination, with means for thrashing and separating the seed from the straw, of a conveyer arranged to receive the seed, a separate conveyer arranged to receive the straw, a beater arranged above the straw and conveyer, and a series of diminishingly corrugated brake rolls arranged to receive the straw from its conveyer, substantially as described.

In testimony whereof I have hereunto set my hand this 11th day of April, 1892.

JOHN T. SMITH.

In presence of—
M. S. HANSON,
T. A. DIESON.