

No. 725,884.

PATENTED APR. 21, 1903.

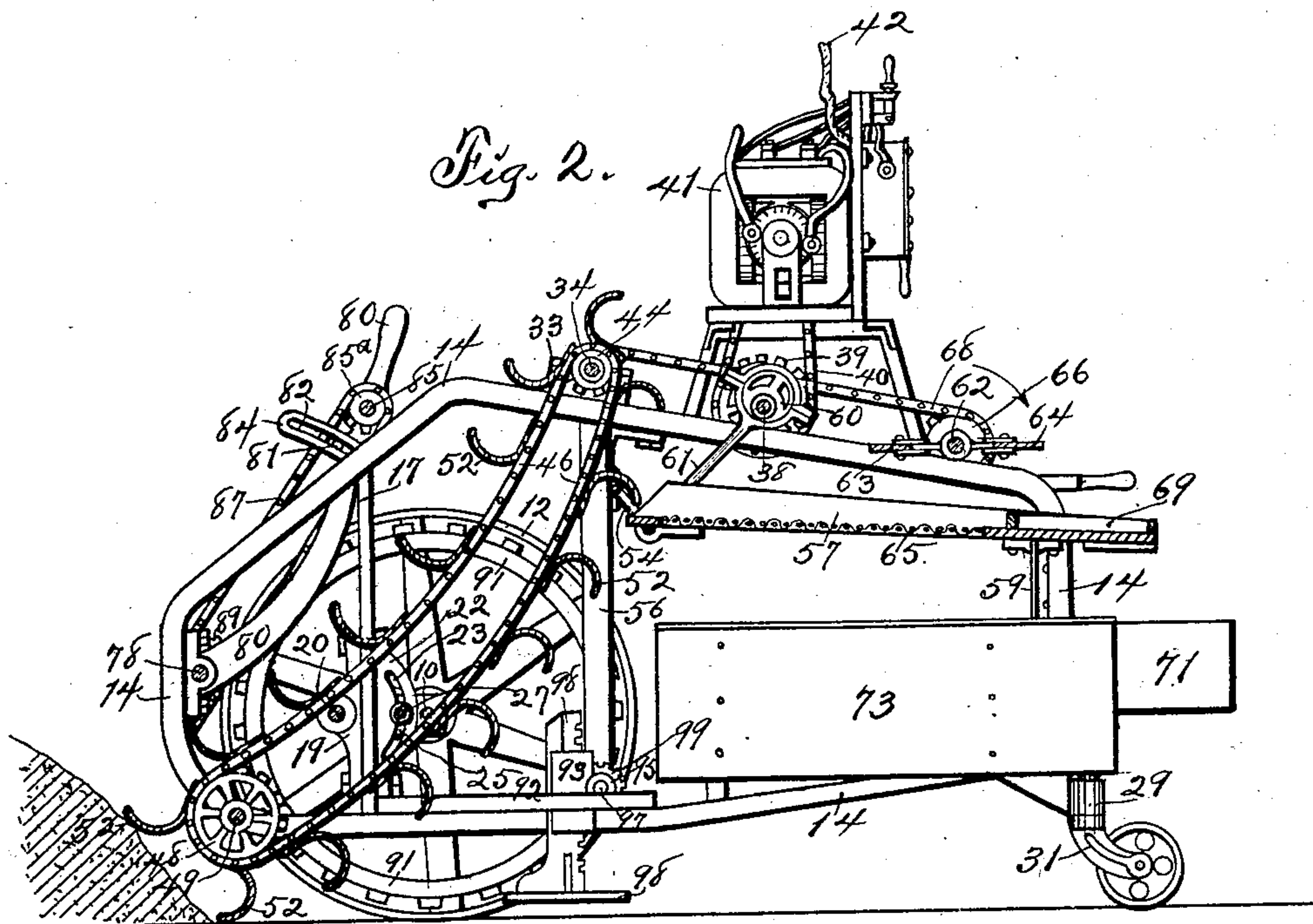
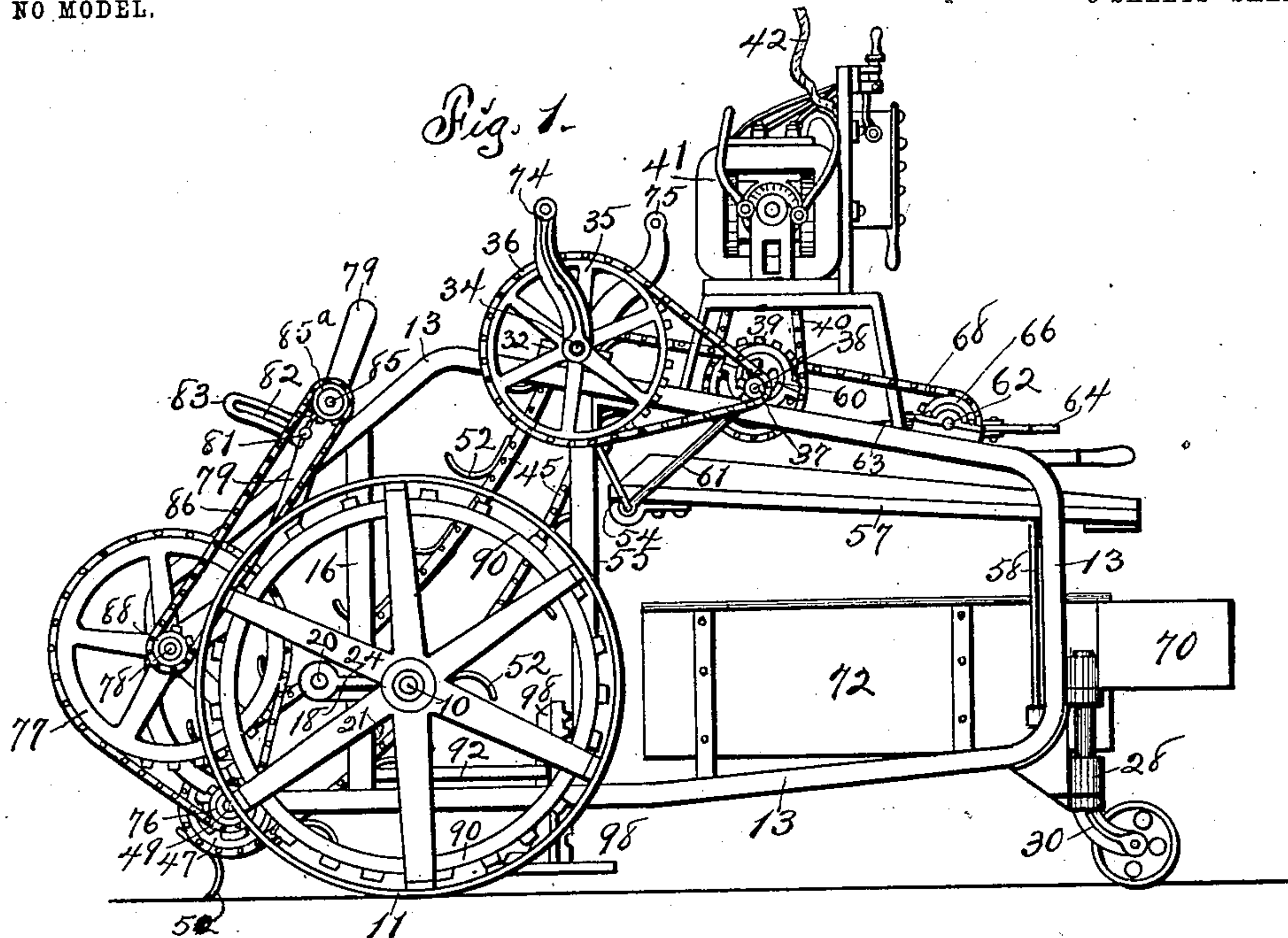
N. K. SKOW.

SAND CUTTING, SIFTING, LUMP CRUSHING, AND MIXING MACHINE.

APPLICATION FILED JUNE 9, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



Attest:
R. D. Pageol,
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Inventor:
Nels K. Skow,
By J. C. Swack
Att'y

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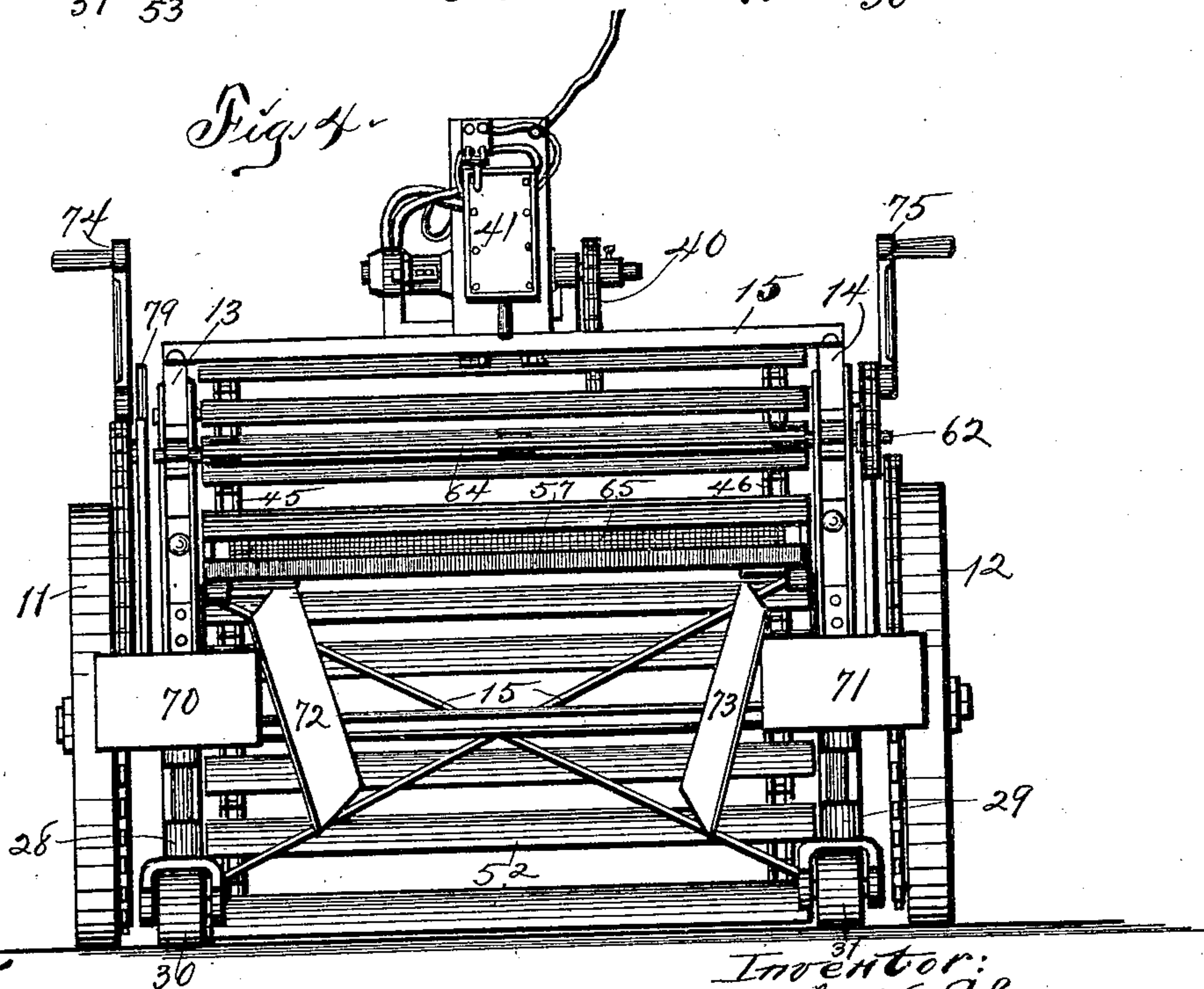
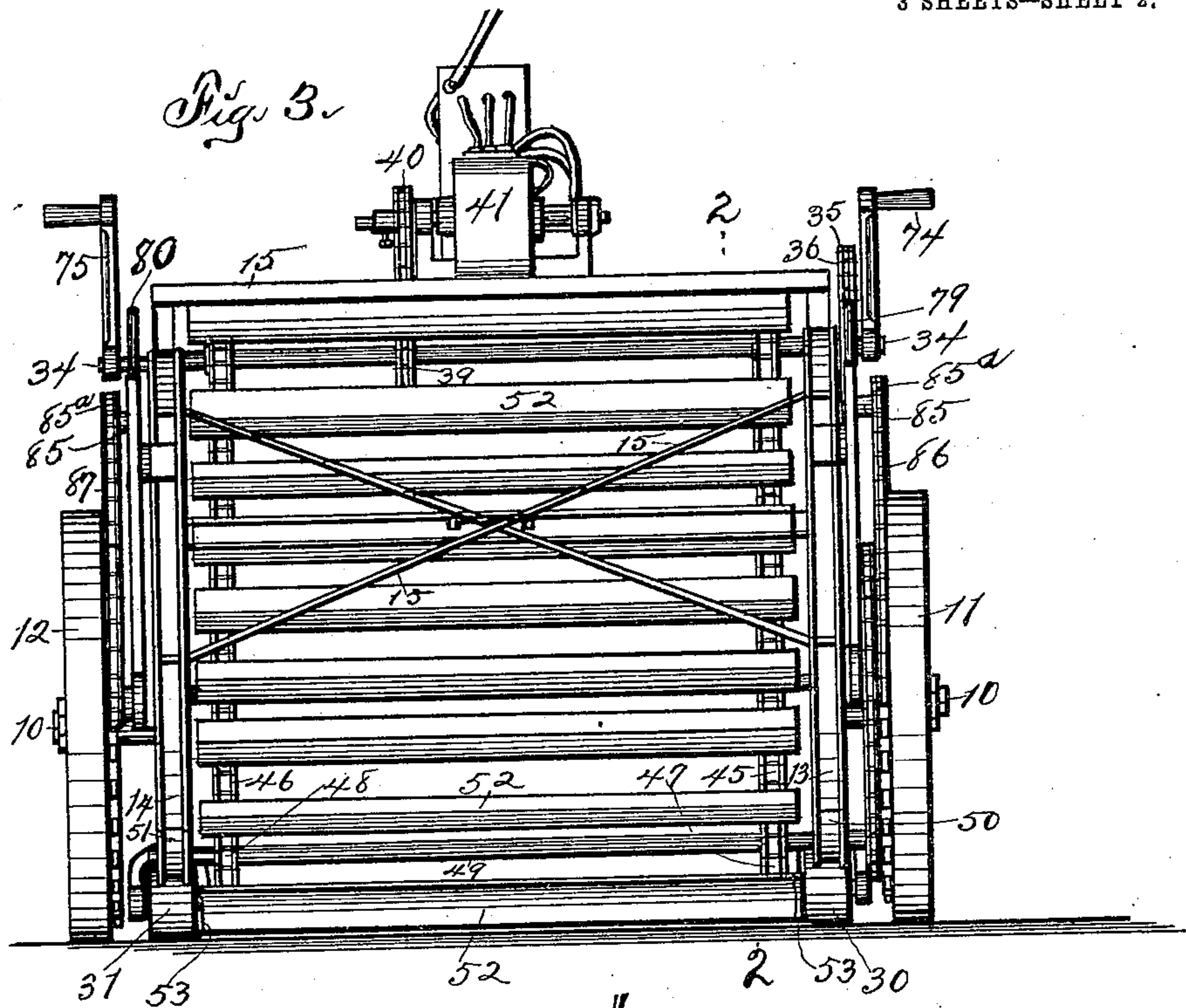
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3 SHEETS—SHEET 2.



Attest:
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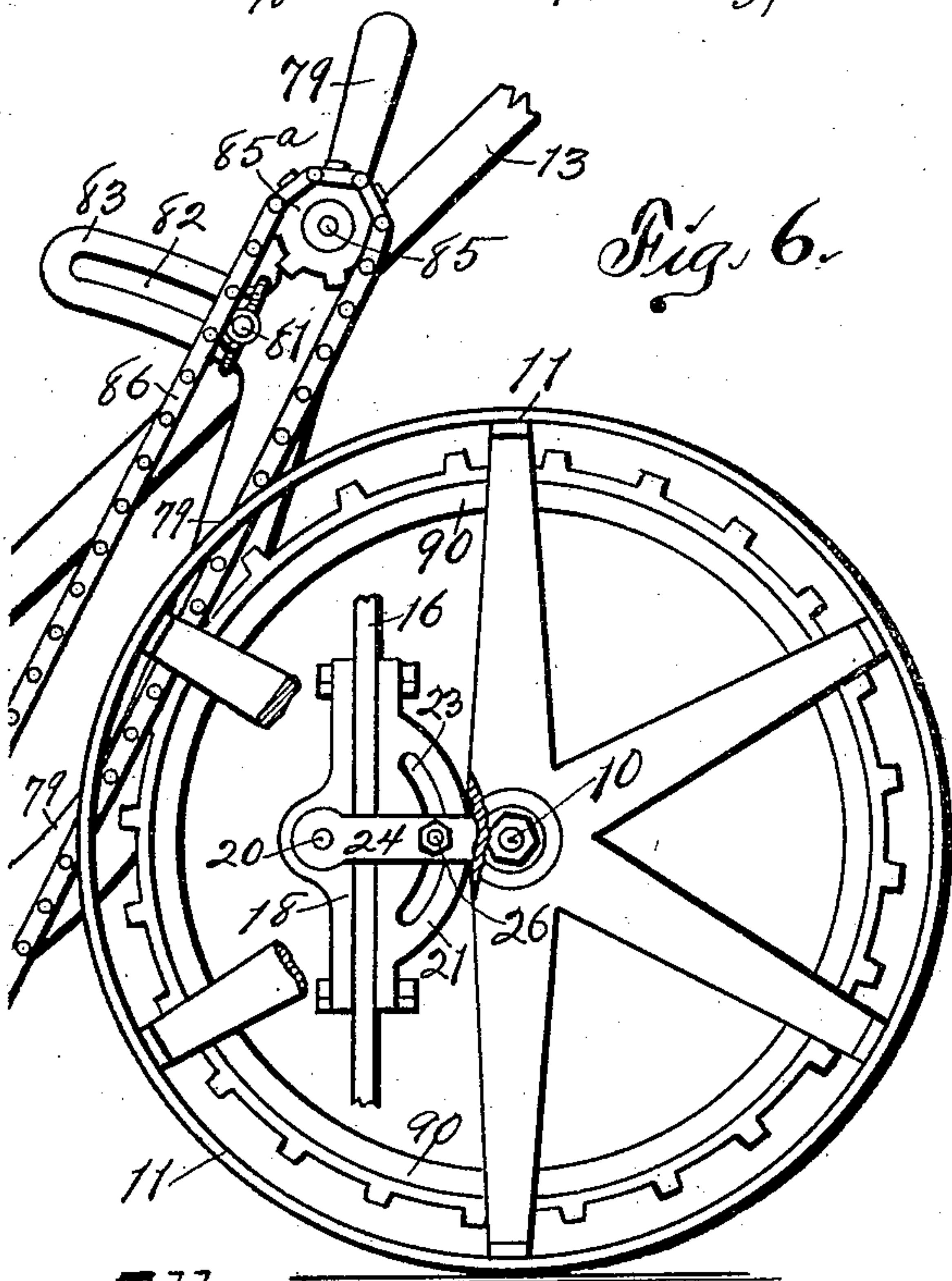
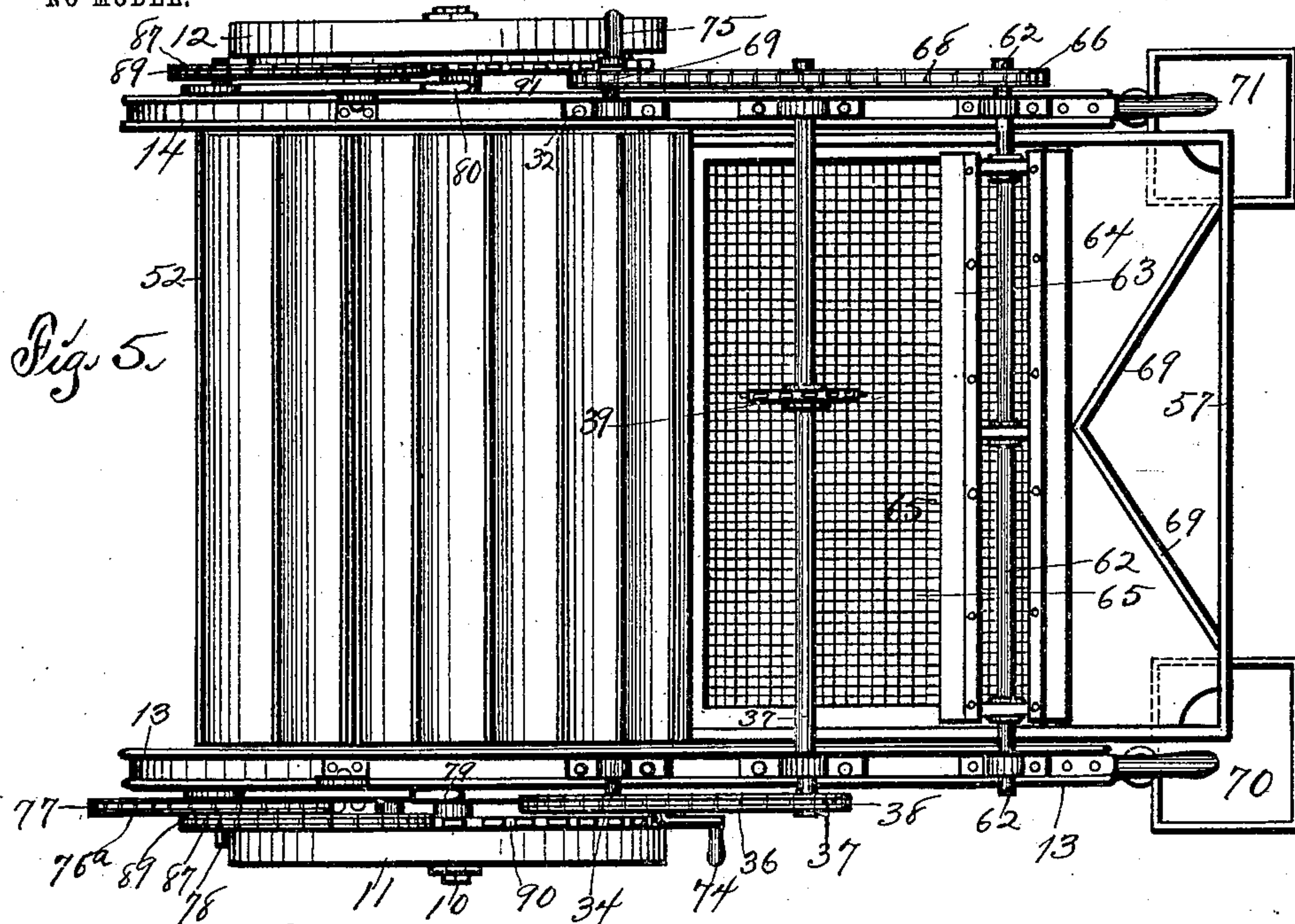
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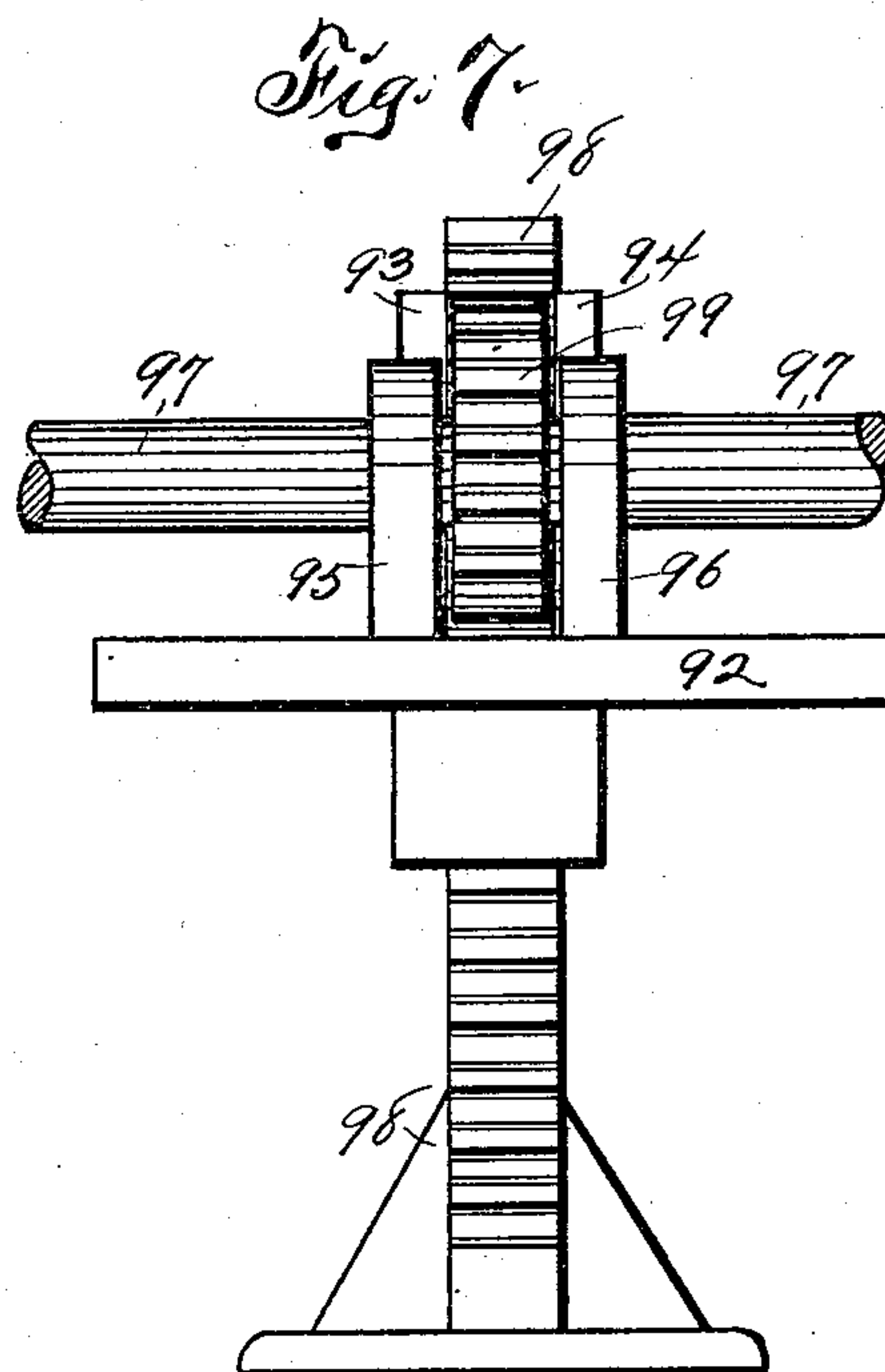
APPLICATION FILED JUNE 9, 1902.

NO MODEL.

3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

NIELS K. SKOW, OF NEWTON, IOWA.

SAND CUTTING, SIFTING, LUMP-CRUSHING, AND MIXING MACHINE.

SPECIFICATION forming part of Letters Patent No. 725,884, dated April 21, 1903.

Application filed June 9, 1902. Serial No. 110,738. (No model.)

To all whom it may concern:

Be it known that I, NIELS K. SKOW, a citizen of the United States of America, and a resident of Newton, Jasper county, Iowa, have invented a new and useful Sand Cutting, Sifting, Lump-Crushing, and Mixing Machine, of which the following is a specification.

The object of this invention is to provide improved means for cutting, elevating, conveying, sifting, and depositing molders' sand, for crushing the lumps in such sand, and for removing and collecting the gagers, nails, and scrap that may accumulate in such sand preparatory to using the sand again in the making of molds.

My invention consists in the construction of a machine for treating molders' sand, as hereinafter set forth, pointed out in my claims, and illustrated by the accompanying drawings, in which—

Figure 1 is a side elevation of the complete machine. Fig. 2 is a vertical section of the machine on the indicated line 2 2 of Fig. 3. Fig. 3 is a front end elevation of the complete machine. Fig. 4 is a rear end elevation of the complete machine. Fig. 5 is a plan of the complete machine. Figs. 6 and 7 are detail views of parts of the machine.

In the construction of the machine as shown the numeral 10 designates the main supporting-shaft, mounted at its ends in combined traction and supporting wheels 11 12. The shaft 10 extends from side to side of the machine, and the wheels 11 12 are relatively large and strong. Side frames 13 14 are provided and preferably are made of channel-iron in endless form. The side frames 13 14 are arranged vertically, as shown, parallel with each other near the end portions of the shaft 10 and are connected by a plurality of cross-bars 15 in various positions. Vertical bars 16 17 are mounted across and fixed at their ends to the forward portions of the side frames 13 14. Bearings 18 19 are fixed to and project forward from the vertical bars 16 17 at points below the centers of said bars, and a shaft 20 is mounted for oscillation in said bearings and extends from side to side of the machine. Bearings 21 22 are mounted on the vertical bars 16 17 directly opposite the bearings 18 19 and extend rearward therefrom. Segment-slots 23 are formed in the bearings

21 22 at the rear of the vertical bars. Crank-arms 24 25 are mounted on and extend rearward from the end portions of the shaft 20, and the end portions of the shaft 10 extend through the rear end portions of said crank-arms. Bolts 26 27 are mounted in the crank-arms 24 25 and extend through the segment-slots 23 of the bearings 21 22, and nuts on said bolts serve to connect the crank-arms adjustably to said bearings. By this means it is possible to vary and adjust the elevation of the side frames 13 14 relative to the horizontal plane of the shaft 10. Caster-bearings 28 29 are mounted on the rear lower corner portions of the side frames 13 14, and caster-wheels 30 31 are journaled in said bearings and support said side frames conjunctively with the wheels 11 12. Bearings 32 33 are mounted on the centers of the upper portions of the side frames 13 14, and a drive-shaft 34 is journaled in said bearings and extends from side to side of the machine. A sprocket-wheel 35 is mounted on one end portion of the drive-shaft 34 and is connected by a sprocket-chain 36 to a smaller sprocket-wheel 37 on one end portion of a counter-shaft 38, which counter-shaft also is mounted in bearings on the upper portions of the side frames. A sprocket-wheel 39 on the central portion of the counter-shaft 38 is connected by a chain 40 to the shaft of an electric motor 41, carried on brackets fixed to and rising from the side frames. Current is supplied to the motor 41 through a flexible conductor 42, leading from a source of energy, (not shown,) and said conductor should be of such length as will permit the machine and motor thereon to travel considerable distances across the molding-room. Sprocket-wheels 43 44 are mounted on the end portions of the drive-shaft 34, and conveyer-chains 45 46 are mounted for travel thereon. The lower portions of the conveyer-chains 45 46 run under sprocket-wheels 47 48 on a shaft 49, journaled in bearings 50 51, mounted in the lower forward corners of the side frames 13 14. The conveyer-chains 45 46 are connected by and carry buckets or scoops 52, preferably made of sheet metal and arranged to extend from side to side of the machine. The elevation of the side frames relative to the main shaft 10 is such that the buckets or scoops 52 just clear the surface of

the molding-floor, over which the machine travels, and in the travel of such buckets receive and elevate sand and objects intermingled therewith. Gathering-plows 53, Fig. 3, may be attached to the lower forward corners of the side frames and extend forward therefrom in diverging planes to engage and gather the sand from the molding-floor into the path of travel of the scoops or buckets 52. A bail 54 is journaled at its ends in vertical bars 55 56, mounted in the side frames, and the body portion of said bail is in a plane parallel with its journaled end portions and is pivotally connected to the forward end portion of a screen-frame 57. The screen-frame 57 extends rearward and downward from the bail 54 and is supported at its rear lower end on upright spring-arms 58 59, which arms are fixed at their lower ends to and rise from the rear lower corners of the side frames. An eccentric 60 is mounted rigidly on the counter-shaft 38 and carries one end of a pitman 61, the other end of said pitman being connected pivotally to the body portion of the bail 54. Thus in the rotation of the counter-shaft 38 the bail 54 is oscillated, resulting in a vibration of the screen-frame 57, the spring-arms 58 59 swinging to and fro with said screen-frame. A beater-shaft 62 is mounted for rotation in bearings fixed to the upper portions of the side frames 13 14 at the rear of the counter-shaft 38, and beaters 63 64 are mounted on said beater-shaft and have their orbit of travel in close proximity to the upper surface of the screen 65 in the screen-frame 57. A sprocket-wheel 66 on the beater-shaft 62 is connected to a sprocket-wheel 67 on the drive-shaft 34 by a sprocket-chain 68. Thus are the beater-shaft and beaters driven to the end of engaging and crushing or breaking the clods and lumps in the sand on the screen 65. Holes are formed in the rear corners of the screen of such size as will permit the passage therethrough of the gaggers, nails, and scrap from the sand, and a deflector 69 is mounted in the rear portion of said screen and directs such foreign substances laterally from the screen to said holes. The foreign substances drop through the holes in the rear corners of the screen and are received and contained in receptacles 70 71, carried on the side frames beneath said holes. Gathering-boards 72 73 are fixed to the side frames 13 14 beneath the screen-frame 57 and serve to direct the sifted sand falling from said screen into a compact pile between the colter-wheels.

Hand-cranks 74 75 may be mounted on the drive-shaft 34 for the manual rotation of said shaft, if desired.

A small sprocket-wheel 76 is mounted on the extremity of the shaft 49 and is connected by a chain to a larger sprocket-wheel 77 on a counter-shaft 78, journaled for rotation in bearings fixed to the forward portions of the side frames. Arms 79 80 are pivoted on and extend rearward and upward from the

counter-shaft 78 and are formed with handles at their upper rear ends. Bolts 81, provided with wing-nuts, are mounted through the upper end portions of the arms 79 80 and extend through segment-slots 82 in brackets 83 84, fixed to and rising from the side frames 13 14. A shaft 85 is mounted in and connects the upper portions of the arms 79 80, and sprocket-wheels on said shaft are connected by chains 86 87 to sprocket-wheels 88 89 on the counter-shaft 78. The sprocket-chains 86 87 also engage at times with sprocket-wheels 90 91, formed on the supporting and traction wheels 11 12. It is thus seen that the motion of the motor is transferred or communicated to the supporting and traction wheels through the counter-shaft 38, sprocket-wheel 37, chain 36, wheel 35, drive-shaft 34, conveyer-chains 45 46, counter-shaft 49, shaft 78, and chains 86 87 and their respective connections. In the rotation of the supporting and traction wheels the machine is advanced conjunctively with and at a speed proportioned to the travel of the buckets or scoops 52, and the sand is gathered from the molding-floor, elevated by the scoops, and deposited on the screen 65. In the vibration of the screen 65 the sand is sifted through the mesh thereof, the clods and lumps are broken by the beaters, and the foreign substances are deposited in the receptacles 70 71 pending manual removal. When the bars or arms 79 80 are adjusted with the bolts 81 in the uppermost portions of the slots 82, the chains 86 87 are disconnected from the sprocket-wheels 90 91, and the rotation of the supporting and traction wheels is stopped. Such adjustment is necessary at times when it is desired to elevate and sift an exceptionally-large quantity of sand in one locality.

Sometimes it is desirable to turn the machine about in a relatively small space, and hence I have provided a jack constructed and mounted as follows: A cross-bar 92 is fixed to and connects the side frames 13 14 at the rear of the shaft 10, and guide-blocks 93 94 are fixed to said bar. Bearings 95 96 are mounted on the bar 92, and a shaft 97 is mounted for rotation in said bearings and extends to one side of the machine. A winch or crank may be detachably mounted on the angular outer end portion of the shaft 97. A jack 98 is provided and formed with a base and a stem rising from the base through the bar 92 and between the blocks 93 94. One edge of the stem is toothed and meshes with a pinion 99 on the shaft 97. Normally the jack is carried with its base just clearing the floor. When it is desired to turn the machine in a small space, the shaft 97 is rotated manually to cause the pinion 99 to depress the stem of the jack, and when the base of the jack contacts with the molding-floor and the rotation of the pinion is continued the frame of the machine and the supporting and traction wheels are lifted. The machine may then be balanced on the jack and swung

around, the base of the jack turning on the floor in the turning of the machine.

I claim as my invention—

1. A machine of the class described, comprising the wheeled truck or frame, the elevating mechanism mounted therein, the traction-wheels mounted on the frame, the gear-wheels mounted on the traction-wheels, the oscillating frame mounted on the forward end of the main frame, gearing on the oscillating frame geared to the elevating mechanism and gearing on the oscillating frame geared to the gear-wheels on the traction-wheels, a horizontally-vibrating screen arranged to receive sand from the elevating mechanism, driving connections between the elevating mechanism and said screen, a beater mounted over the screen and arranged to engage the sand thereon, and receptacles mounted on the main frame and arranged to receive articles from the surface of the screen.

2. In a machine of the class described, the main frame, the axle mounted for vertical adjustment in said main frame, traction mechanism connected to said axle, secondary frames arranged for manual oscillation on the forward end of the main frame, gear connections between the oscillating frames and the traction mechanism, sand-elevating mechanism on the main frame geared to the mechanism on the oscillating frame, the screen mounted for reciprocation approximately in a horizontal plane in the main frame, and receptacles arranged to receive articles from the surface of said screen.

3. In a machine of the class described, the main frame, the traction-wheels supporting

the same, the caster-wheels supporting the rear end of the main frame, gear-wheels on the traction-wheels, sand-elevating mechanism on the main frame, levers mounted on the main frame and arranged for oscillatory adjustment, sprocket-gearing carried by said levers and arranged for adjustment relative to and engagement by the gear-wheels on the sprocket-wheels and sprocket, gearing carried by said levers and arranged for engagement with the elevating mechanism, a screen, a beater and receptacles arranged to receive articles from the surface of said screen.

4. A machine of the class described, comprising the wheeled truck or frame, the elevating mechanism mounted therein and consisting of horizontal shafts, sprocket-wheels on said shafts, sprocket-chains on said sprocket-wheels and scoops connected to and connecting said chains, the traction-wheels mounted on the frame, the gear-wheels rigidly mounted on the traction-wheels, the oscillating frame hinged at its lower end on the forward end of the main frame, gearing on the oscillating frame geared to the elevating mechanism, gearing on the oscillating frame consisting of horizontal shafts, sprocket-wheels on said shafts, and chains on said sprocket-wheels engaging the gear-wheels on the traction-wheels, and means for sifting the sand after it is elevated.

Signed by me at Newton, Iowa, this 20th day of February, 1902.

NIELS K. SKOW.

Witnesses:

OLIVER P. MYERS,
ADAM M. HARRAH.