

No. 688,637.

Patented Dec. 10, 1901.

C. C. GRIDLEY.
STARCHING MACHINE.
(Application filed Feb. 10, 1900.)

(No Model.)

4 Sheets—Sheet 1.

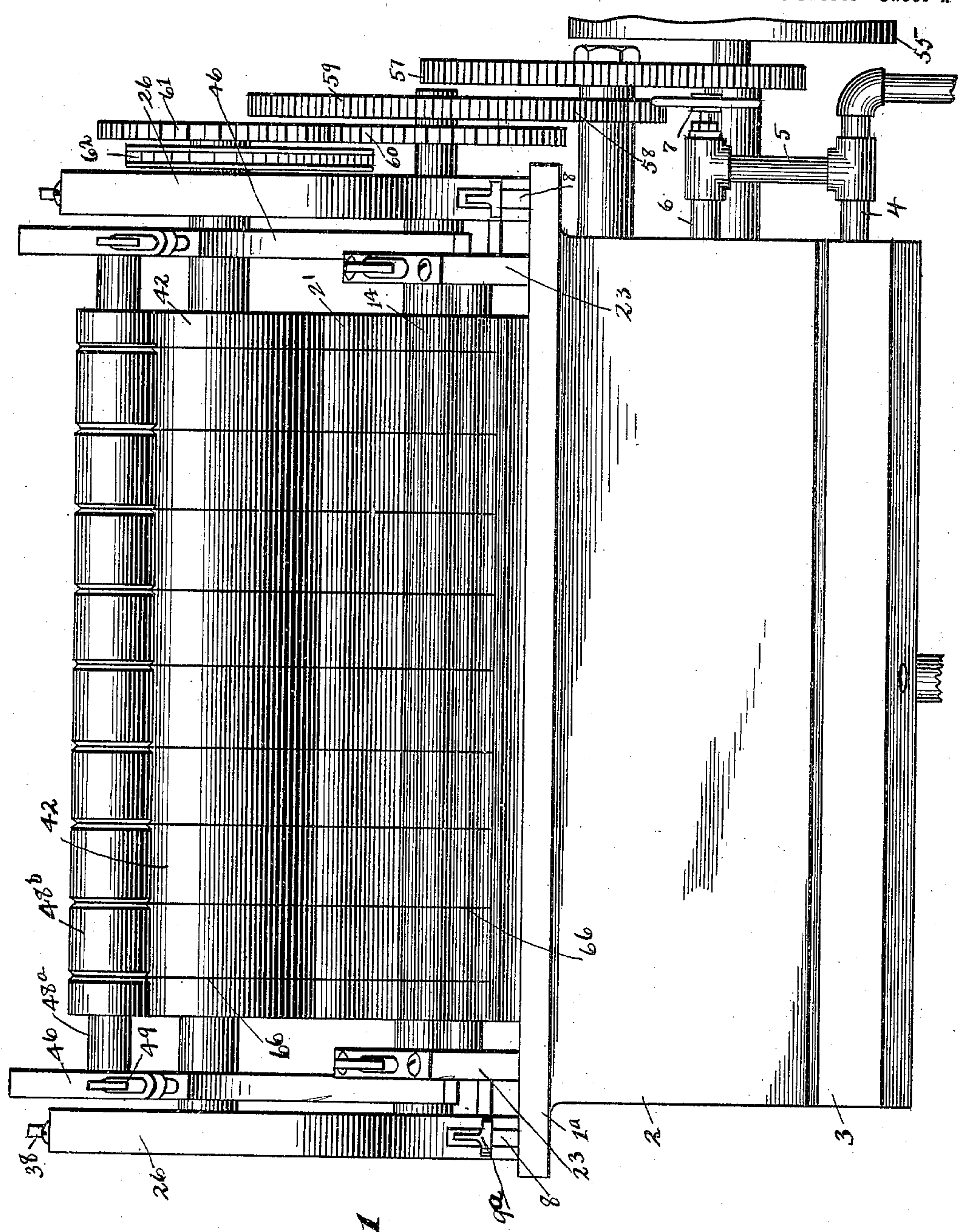


Fig. 1

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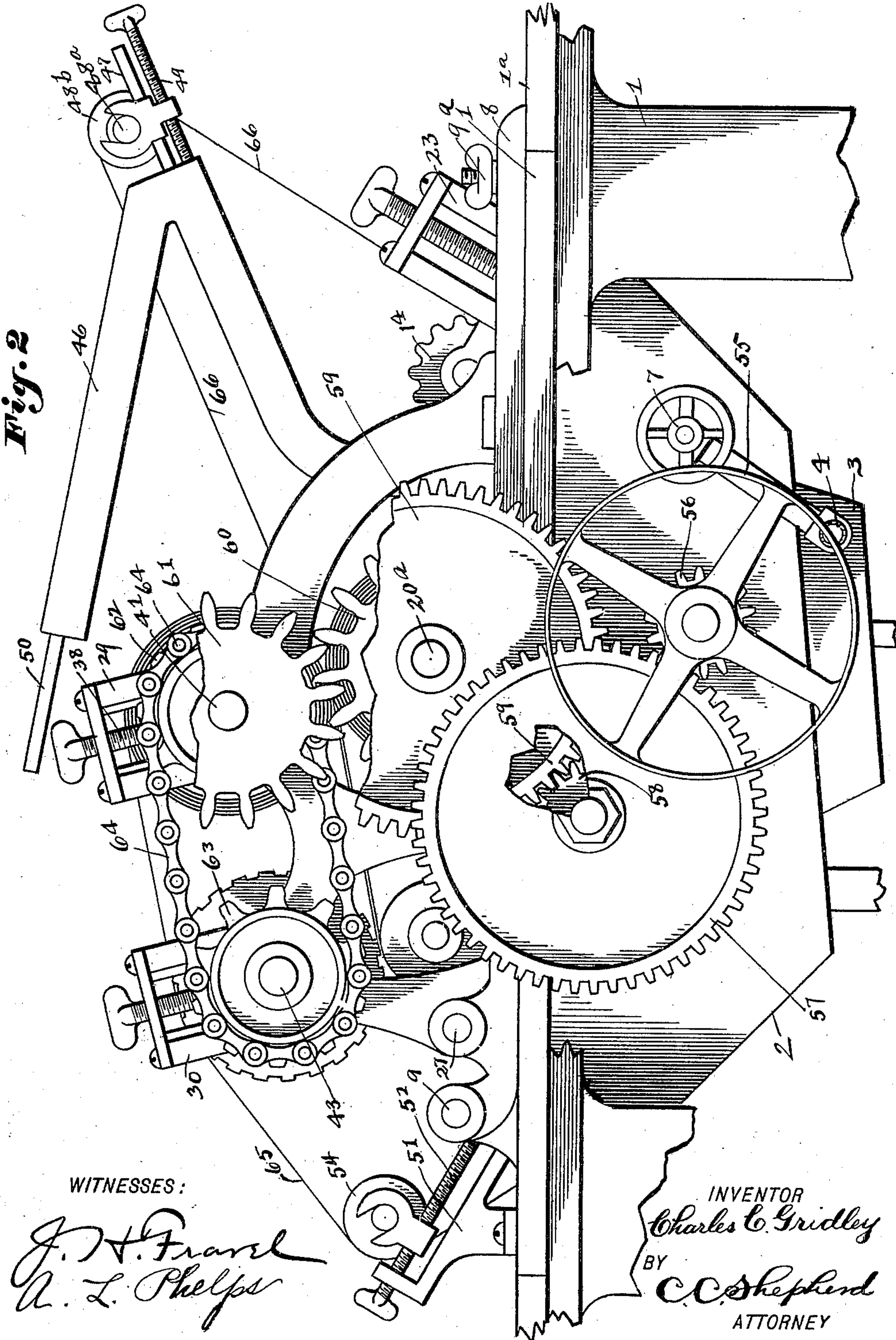
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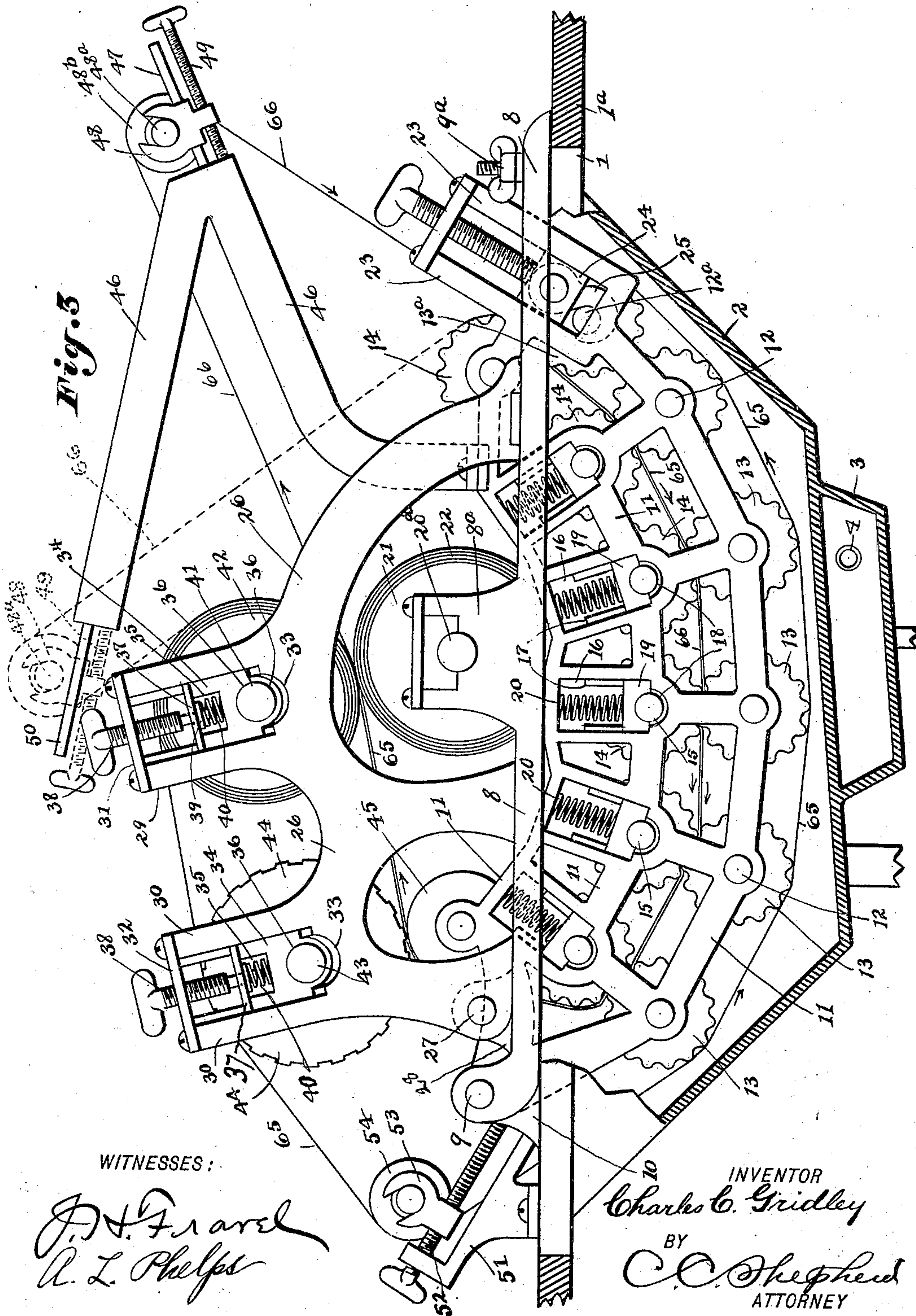
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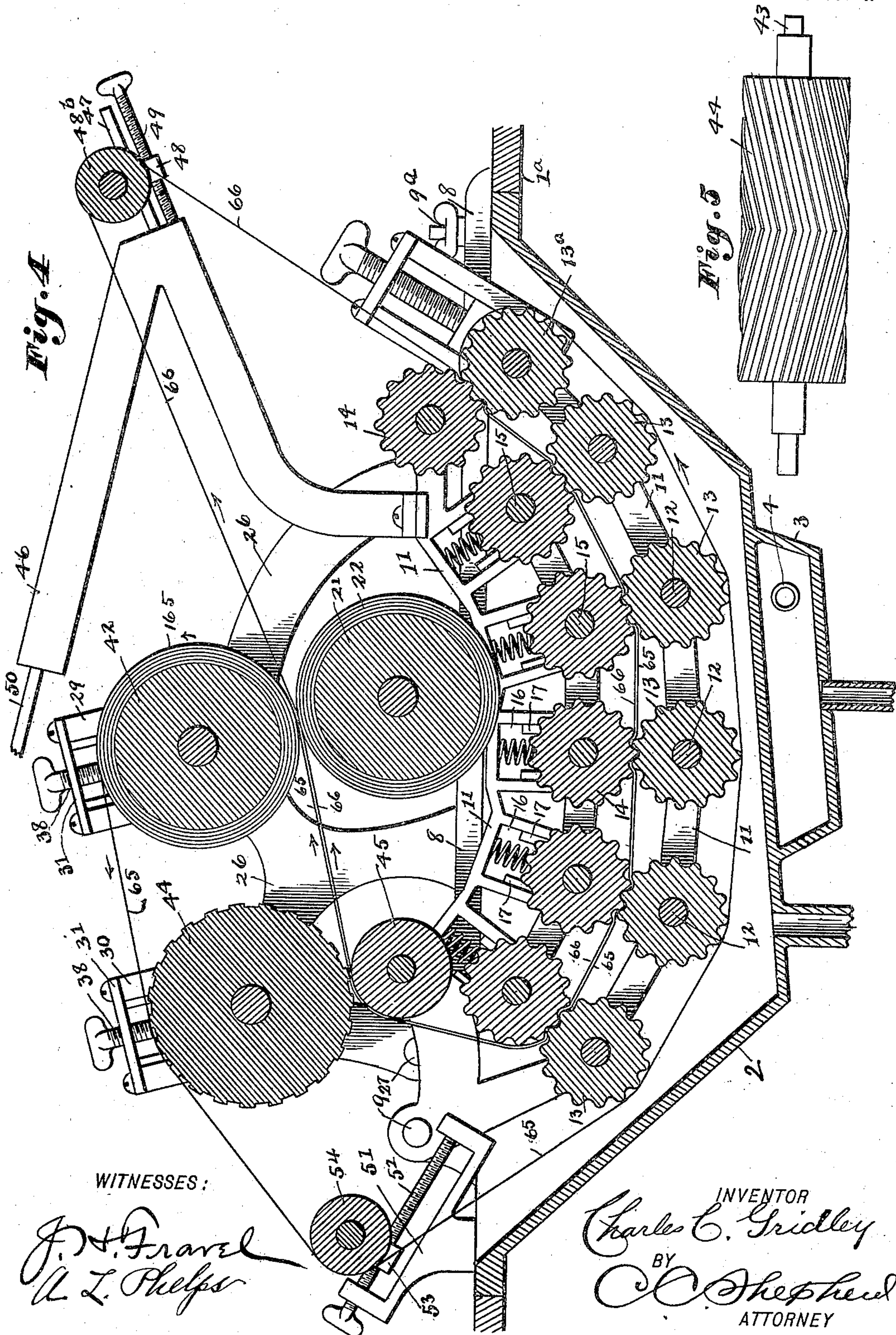
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4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

CHARLES C. GRIDLEY, OF COLUMBUS, OHIO.

STARCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 688,637, dated December 10, 1901.

Application filed February 10, 1900. Serial No. 4,720. (No model.)

To all whom it may concern:

Be it known that I, CHARLES C. GRIDLEY, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Starching-Machines, of which the following is a specification.

My invention relates to the improvement of starching-machines of that class which are particularly adapted for use in steam-laundries; and the objects of my invention are to provide an improved machine of this character of superior construction and arrangement of parts; to so construct and arrange the same as to insure a thorough and rapid starching of the goods which are passed through said machine; to provide improved means for wiping the surplus starch from the goods; to provide improved adjustable bearings for several of the rolls; to provide improved means for raising the mechanism from the starch-reservoir and for gaining access to the lower rolls, and to produce other improvements the details of which will be more fully pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is an end view, which for the sake of clearness I will term the "front" end. Fig. 2 is a side elevation. Fig. 3 is a partial longitudinal section through the starch-pan with the outer frame and gearing removed. Fig. 4 is a central vertical section of the machine, and Fig. 5 is a reduced plan view of a feeding-roll which I employ in the manner hereinafter described.

Similar numerals refer to similar parts throughout the several views.

In carrying out my invention I employ a suitable supporting frame or table 1, which for the sake of clearness in illustration is but partially shown in the drawings. Within this supporting-frame I support a starch reservoir or pan 2, the latter having, as shown in the drawings, converging forward and rear sides and an inclined bottom. Depending from this inclined bottom portion is a steam or heating compartment 3, into which leads from a suitable source of steam-supply a pipe 4, the latter having on the outer side of the heating-compartment an arm 5, which leads

to a steam-supply pipe 6, which enters the starch-compartment 2, the communication between the pipe-arm 5 and pipe 6 being controlled by a valve 7.

8 represents parallel frame-bars, the rear upturned ends of which are pivoted at 9 to oppositely-located upwardly-projecting lugs 10 on the upper sides of the side arms of the frame 1. The remaining ends of these frame-bars 8 are adapted to bear upon the forward cross-bar 1^a of the frame 1 and to be detachably secured in this position through the medium of a screw and clamping-nut thereon, such as are indicated at 9^a. The frame-bars 8 have connected therewith and depending therefrom correspondingly-shaped and oppositely-located bearing-frames 11, each of these frames 11 describing substantially the arc of a comparatively large circle and normally extending within the starch-compartment 2. In constructing the bearing-frames 11 I provide the same at intervals in their lower portions with journal-bearing openings in which are adapted to bear, as shown, the end spindles or journals 12 of transverse longitudinally-corrugated rolls 13, said rolls thus being arranged substantially in the arc of a circle. These lower rolls 13 have their teeth meshing with those of an upper set of similar corrugated rolls 14, the spindles 15 of which are journaled at points on radial lines with the spindles 12 in said frames 11. In producing each of these upper corrugated roller-bearings I form the upper portion of the frame 11 with an upright and oblong opening 16, the latter having inwardly-projecting oppositely-located guide projections 17 and a half-round lower end termination 18. Adapted to slide vertically within each of the openings 16 and on the guides 17 is a bearing-block 19, the latter having a half-journal recess on its under side against which the upper side of the journal or spindle 15 bears. Between each of the bearing-blocks 19 and upper side of the opening 16 I interpose a coiled spring 20, this spring normally exerting a downward pressure on said bearing-block and upper corrugated roll-spindle and resulting in a yielding engagement of the teeth or corrugations of the upper and lower rolls.

With each of the frame-bars 8 I form a cen-

tral upwardly-projecting bearing-bracket 8^a, in which brackets are journaled the spindles 20^a of a transverse wiping-roll 21, the latter being provided with a padded periphery 22, this padding consisting of the desired number of layers of wool goods.

As indicated at 23, I provide the forward portion of each of the side bearing-frames 11 with a recess or oblong frame termination, and within this recess I provide a screw-actuated sliding block 24, from a transverse center pin of which depends a hook 25, the latter engaging and forming a bearing for the spindle 12^a of the outer one of the lower corrugated rolls 13^a.

Normally bearing upon the side frame-bars 8 are the lower portions of the parallel upper side frames 26, the latter being hinged at 27 to upwardly-projecting lugs 28 of the frame-bars 8. Each of the frame-pieces 26 is provided, as shown, with two upwardly-extending bearing portions 29 and 30, which are bifurcated or substantially yoke-shaped, and the parallel arms thus formed being connected at their outer ends by cross-bars 31 and 32. At the inner end of each of these yoke-shaped projections I form a half-round depression 33, and within each of said yokes I provide a sliding bearing-block 34, which in turn is provided with a recess 35 and an under side round bearing-recess 36. The upper side of each of the blocks is provided with a transverse bar 37, and through this bar extends loosely the inner unthreaded reduced end portion of an adjusting-screw 38, the threaded and larger portion of the latter engaging a central threaded opening in the bar 31, (or 32.) On the reduced inner end portion of the screw 38 I provide a projection 39, between which and the bottom of the recess 35 is interposed a spring 40.

Bearing in the bearing-recesses 36 of the blocks 34 of the bearing projections 29 are the spindles 41 of an upper wiping and guide roll 42, the periphery of which is padded to correspond with the lower roll 21. In the bearing-blocks 34 of the bearing projections 30 are journaled the end spindles 43 of a feed and guide roller 44, the latter being, as indicated more clearly in Fig. 5 of the drawings, provided with angular peripheral grooves extending lengthwise of the roll. Beneath the feed-roll 44 are journaled in the upper portions of the frames 11 the spindle ends of a comparatively small roll 45.

Upon the upper side and forward portion of each of the frame-pieces 11 I mount the lower arm of an upwardly-projecting and forwardly-extending bracket 46. At the junction of the two arms of this bracket the same is provided with a forwardly-projecting pin 47, on which is mounted to slide a spindle-bearing block 48, the latter having a downward extension through a threaded opening in which passes an adjusting-screw 49. In the brackets 48 are detachably journaled the spindles 48^a of a transverse roll 48^b, the lat-

ter being provided at intervals with peripheral grooves, as shown more clearly in Fig. 1 of the drawings. The rear end of the upper arm of each of the brackets 46 is also provided with a pin extension 50, which corresponds with the pin extension 47. At the opposite or rear end of the machine I cause to project from the frame 1 inclined angular brackets 51, through an opening in the upturned arm of each of which passes an adjusting-screw 52, the inner end of the latter being pivoted in the upturned inner end of this bracket 51. The threaded body of the screw 52 passes through a threaded opening in the downward extension of a roll-bearing block 53, and in these blocks are mounted the end spindles of a small transverse adjusting-roll 54.

In the framework 1 at one side of the machine I journal a power-wheel 55, upon the short shaft of which is carried a pinion 56, the teeth of the latter gearing with those of a journaled gear-wheel 57, the shaft of which carries a pinion 58, the latter gearing with a wheel 59, which is carried on one end of the roll-spindle 20^a. This roll-spindle also carries thereon an inner gear-wheel 60, having comparatively long teeth which are adapted to engage corresponding teeth on a gear-wheel 61, which is on the end of the spindle 41. Upon the spindles 41 and 43 are carried sprocket-wheels 62 and 63, which are connected by a sprocket-chain 64.

65 represents an endless apron or belt which, passing over the rear side of the small roll 54, passes downward about the under sides of the lower corrugated rolls 13, thence over the forward roll 13^a, back between the upper and lower corrugated rolls, thence between the rolls 44 and 45, and over the rolls 42 and 44 to the roll 54.

Running over the adjusting-roll 48^b and in the peripheral grooves thereof are continuous cords 66, the latter extending from said roll 48^b downward between the corrugated rolls 13^a, 13, and 14, and thence over the roll 45 and roll 21 to said adjusting-roll 48^b.

In utilizing my improved starching-machine the starch-reservoir 2 has first deposited therein a desirable quantity of starch, which is retained in a heated condition from the steam which enters said reservoir through the pipe-arm 6 and from the heat imparted from the heat-chamber 3. It is evident that motion is communicated to the rolls 44, 42, and 21 through the gear connections illustrated in Fig. 2 of the drawings and hereinbefore described, this motion of said rolls being imparted through the apron 65 to the corrugated rolls 13^a, 13, and 14 and through the latter and said upper rolls to the carrying-cords 66. The corrugated rolls, as will be seen, run in the starch contained in the reservoir, and in utilizing my machine the goods to be starched are fed between the roll 13^a and the first upper roll 14 and between the apron 65 and cords 66. In this manner the goods are car-

ried upon said apron and between said rolls, thence outward on the cords 66, and over the roll 48^b. In case it is desired to change the delivery of the starched goods to the opposite end of the machine the bearing-blocks 48 and their screws 49 may be removed from the pins 47, said blocks then being mounted upon the pins 50 at the opposite end of the bracket-arms 46 and the roll 48^b moved to the new position. As indicated in dotted lines in Fig. 3 of the drawings, the direction of movement of the cords 66 after they leave the rolls 42 and 21 is upward instead of forward, thus carrying the starched goods over the roll 42 and apron 65, discharging the same over the roll 54.

It will be observed that during the above-described process or operation the goods are not only carried through the starch in the reservoir, but through the crimping action of the corrugations of the rolls 13 and 14 the starch is pressed into and the goods are thoroughly saturated with the same. In passing between the padded rolls 21 and 42 it is obvious that the surplus starch will be wiped from the goods and the latter delivered in a desirable condition.

It will be observed that owing to the spring-bearing of the upper corrugated rolls the latter may accommodate themselves to goods of different thicknesses, said springs thus permitting an automatic adjustment of the rolls. The employment of the springs 40 in the bearing-blocks 34 also provides self-adjusting means for the rolls 42 and 44. In case the screws 38 are turned inward it is evident that said springs may be compressed and a closer adjustment of the rolls 42 and 21 and 44 and 45 may be attained.

For the purpose of gaining access to the corrugated rolls or lower portion of the starching mechanism it is evident that the frames 26 may be raised on their hinge-pins 27, and in order to gain access to the under sides of the corrugated rolls or interior of the starch compartment or reservoir the fastening-nuts 9^a may be removed and the frames 8 and 11, together with the parts connected therewith, may be swung on the hinge-pins 9. It will readily be seen that, if desired, the frames

26 may be detachably clamped in connection with the frames 8.

Owing to the fact that the steam-supply pipe 4 runs directly into the heating-chamber 3, the latter receives the greater proportion of the moisture carried by or contained in the steam, while the drier steam, which rises through the pipe-arm 5, passes through the pipe-arm 6 into the starch-compartment, thus subjecting the starch to comparatively dry steam.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a starching-machine, the combination with a supporting-frame, a starch-reservoir and heating-chamber therefor, of oppositely-located bearing-frames 11, upper and lower corrugated rolls journaled in said frames and arranged substantially in the arcs of circles, contacting padded wiping-rolls journaled above said corrugated rolls, an adjustable roll 54 journaled at one end of the machine, and an endless apron passing over said adjustable roll and between said padded and corrugated rolls, substantially as specified.

2. In a starching-machine, the combination with a supporting-frame and starch-reservoir therein, of oppositely-located bearing-frames 11 supported in said starch-reservoir, frames 26 surmounting said frames 11, wiping-rolls journaled in said frames 26, forwardly-extending angular brackets supported from the frames 11, pins 47 and 50 projecting from the forward and rear ends of said bracket, journal-blocks adapted to be movably mounted on said pins, threaded openings in said journal-blocks, adjusting-screws adapted to work through said openings, a peripherally-grooved roll detachably journaled in said blocks, an endless belt passing between said corrugated rolls and said wiping-rolls, and carrying cords running over said peripherally-grooved roll, between said corrugated rolls and between said wiping-rolls, substantially as specified.

CHARLES C. GRIDLEY.

In presence of—

C. C. SHEPHERD,
A. L. PHELPS.