

J. F. FLAHERTY.
MACHINE FOR FEEDING TAPERED ROLLS.
APPLICATION FILED FEB. 23, 1915.

1,195,571.

Patented Aug. 22, 1916.
4 SHEETS—SHEET 1.

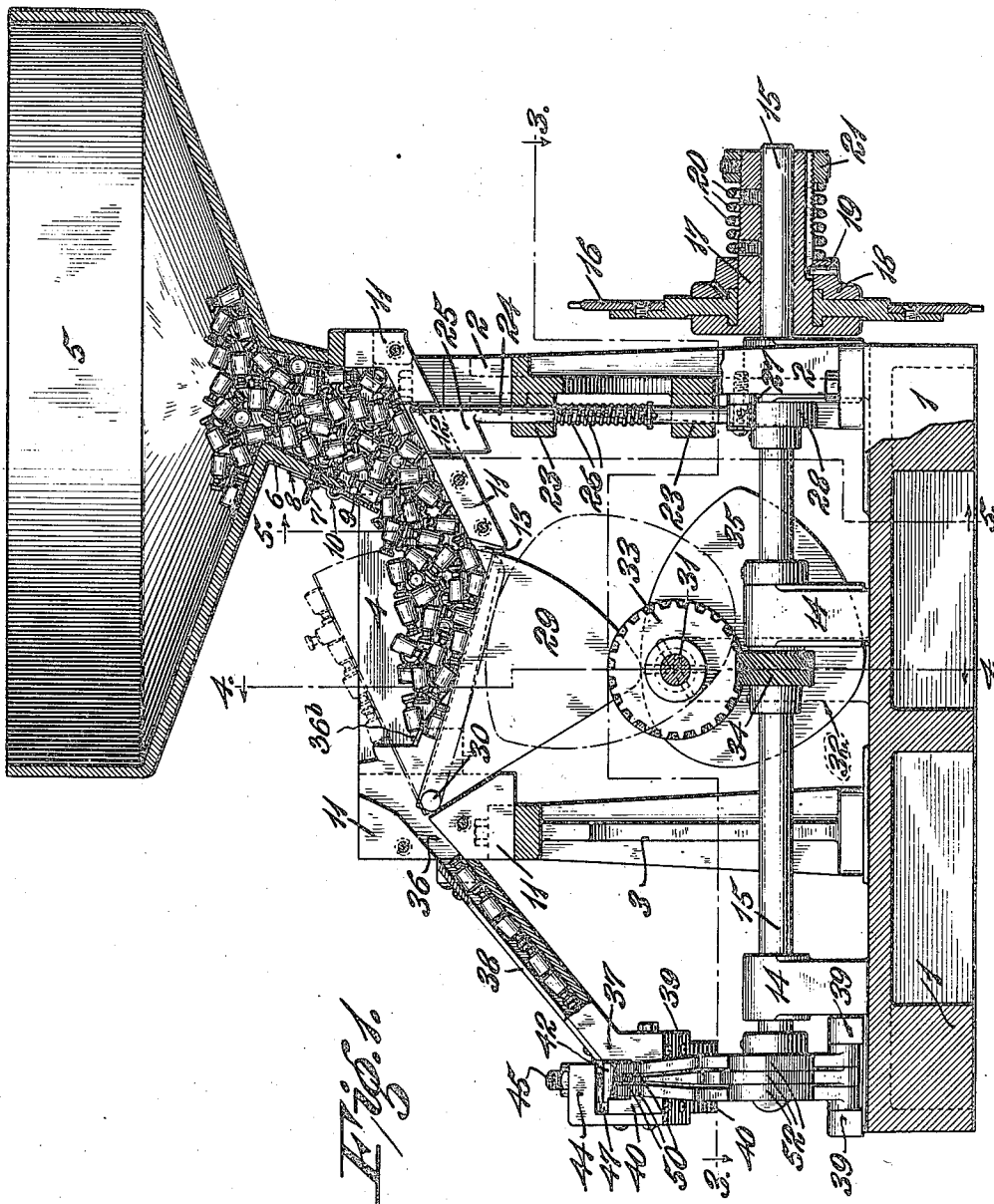


Fig. 1.

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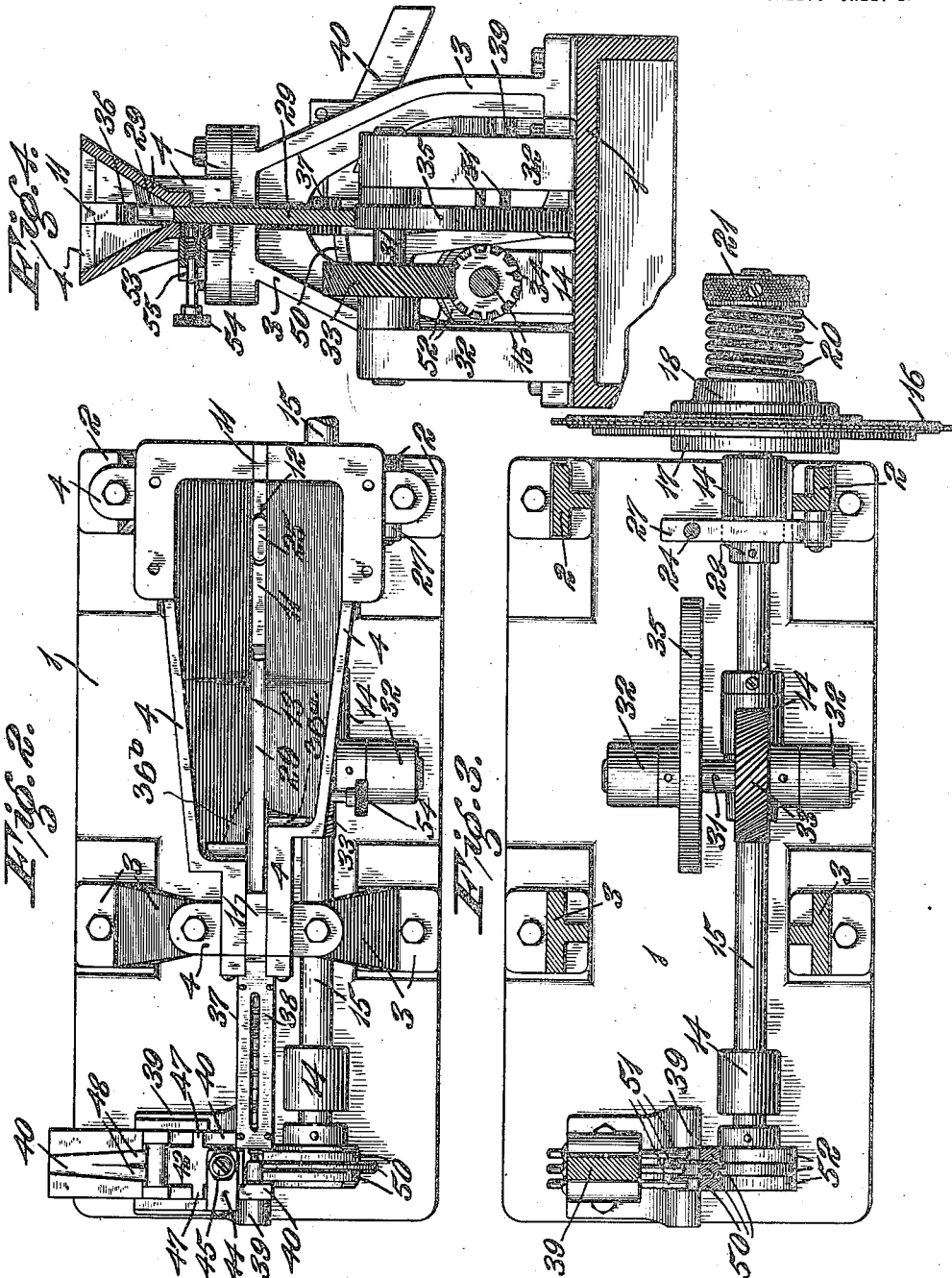
Inventor:
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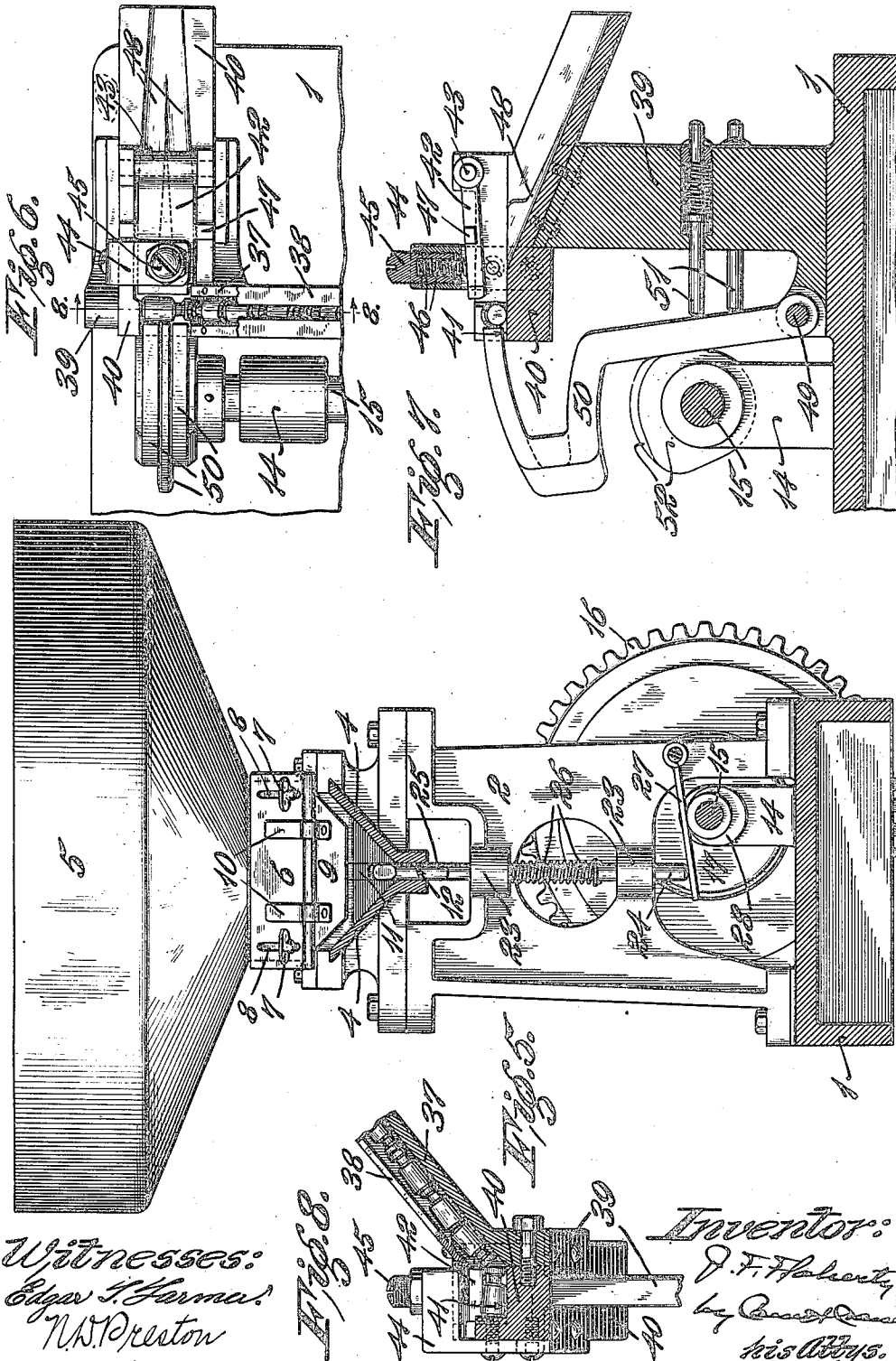
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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

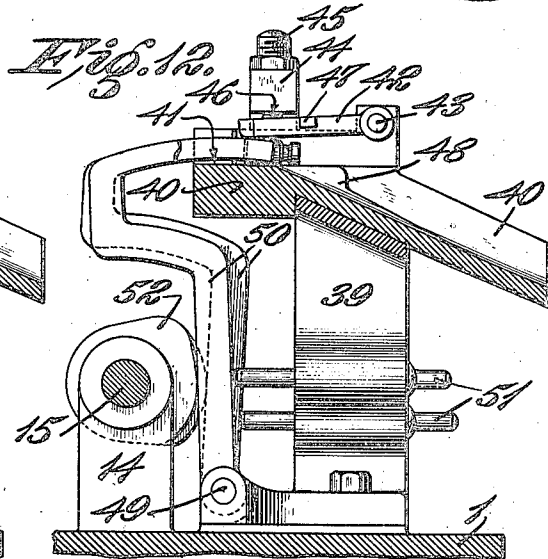
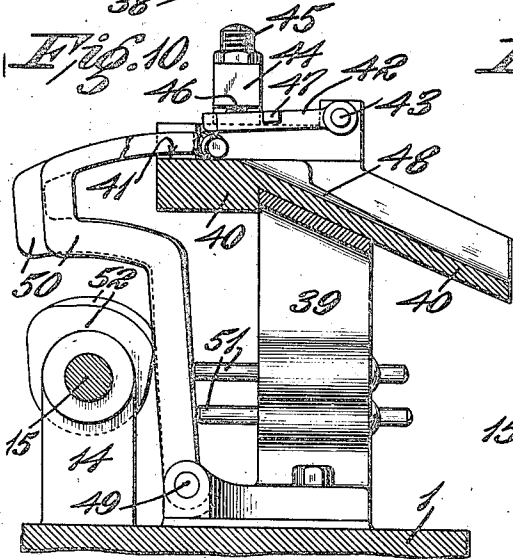
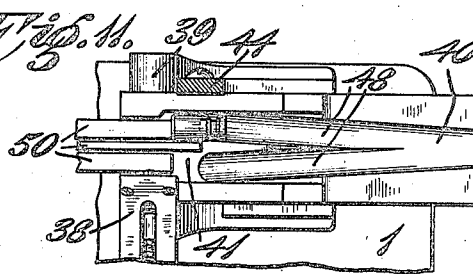
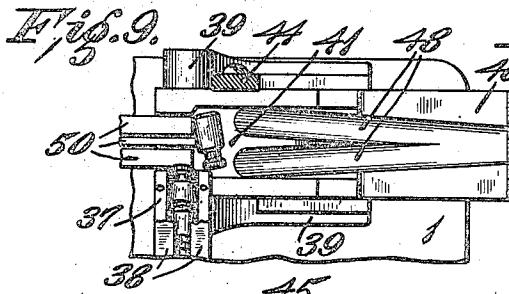
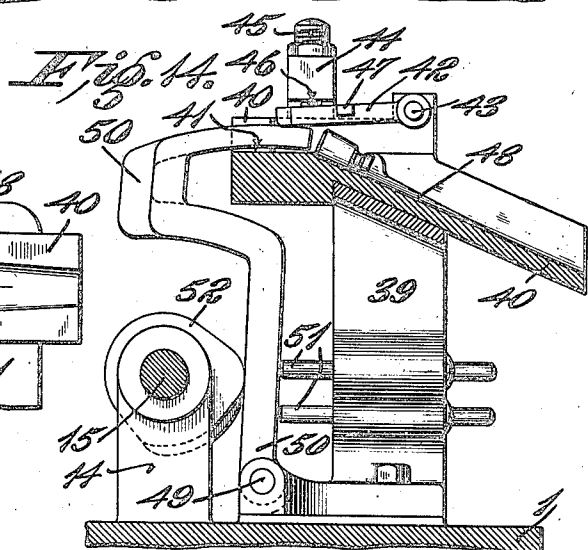
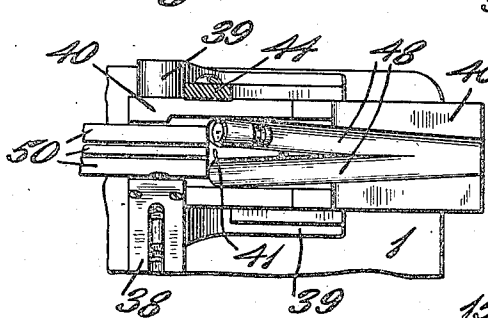


Fig. 13.



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UNITED STATES PATENT OFFICE.

JOHN F. FLAHERTY, OF CANTON, OHIO, ASSIGNOR TO THE TIMKEN ROLLER BEARING COMPANY, OF CANTON, OHIO, A CORPORATION OF OHIO.

MACHINE FOR FEEDING TAPERED ROLLS.

1,195,571.

Specification of Letters Patent.

Patented Aug. 22, 1916.

Application filed February 23, 1915. Serial No. 10,160.

To all whom it may concern:

Be it known that I, JOHN F. FLAHERTY, a citizen of the United States, and a resident of the city of Canton, county of Stark, and State of Ohio, have invented a new and useful Improvement in Machines for Feeding Tapered Rolls, of which the following is a specification.

This invention relates to devices for feeding tapered rolls or similar articles to gaging machines and other machines which require that said rolls shall be fed with like ends of said rolls pointing in the same direction.

The principal object of the invention is a mechanism for acting on a jumble of tapered rolls or similar articles so as to arrange and feed them in a predetermined relation.

Generally stated, the invention comprises a device for arranging the rolls end to end and a turning device which receives the rolls from said first-mentioned device and which turns the rolls so that they point in the same direction.

The invention consists in the parts, and in the arrangements and combinations of parts, more fully set forth hereinafter.

In the accompanying drawings which form part of this specification and in which like reference characters refer to like parts in the several views, Figure 1 is a vertical longitudinal section through a feeding mechanism embodying the invention, some parts being shown in elevation; Fig. 2 is a top plan view of the feeding mechanism, the hopper being removed; Fig. 3 is a horizontal section taken on the line 3—3 in Fig. 1; Fig. 4 is a vertical section taken on the line 4—4 in Fig. 1; Fig. 5 is a vertical section on the line 5—5 in Fig. 1; Fig. 6 is a fragmentary top plan view of the device which turns the rolls so that they point in the same direction, the parts of said device being shown in the position to receive a roll, preparatory to turning it; Fig. 7 is a detail section of the turning device, showing the parts thereof in the position to receive a roll, as shown in Fig. 6; Fig. 8 is a section taken on the line 8—8 in Fig. 6; Fig. 9 is a fragmentary top plan view showing the position of the parts of the turning device after the roll therein has been partly turned; Fig. 10 is a detail section showing the position of the

parts of the turning device after the roll therein has been partly turned, as shown in Fig. 9; Fig. 11 is a fragmentary top plan view showing the position of the parts of the turning device after the roll therein has been completely turned and is ready to be discharged into the chute; Fig. 12 is a detail section showing the parts of the turning device in the position in which they are shown in Fig. 11; Fig. 13 is a fragmentary top plan view showing the position of the parts of the turning device after a roll has been discharged therefrom into the chute; and Fig. 14 is a detail section showing the parts of the turning device in the position in which they are shown in Fig. 13.

The feeding mechanism shown in the accompanying drawings is designed for feeding tapered rolls to a machine for gaging the size of the taper of said rolls preparatory to assembling them into antifriction roller bearings. The parts of the feeding mechanism shown are mounted upon a base plate 1 which is supported in any suitable manner adjacent to the machine to which the rolls are to be fed. At one end of the base plate 1 is bolted an upright standard 2 and near the middle of said base plate is bolted a second upright standard 3. The standards 2 and 3 have substantially the shape of an inverted U. Supported on the standards 2 and 3 and fixed thereto is a receptacle 4. For convenience in description the end of the feeding mechanism near which the receptacle 4 is located will be hereinafter termed the rear end of said feeding mechanism.

A hopper 5 is secured to the receptacle 4 at the rear end thereof which is located over the end standard 2 (see Figs. 1 and 5). This hopper 5 has a conical bottom and a rectangular discharge spout or neck which inclines downwardly and forwardly toward the receptacle 4. On the front wall of the discharge spout of the hopper 5, that is, on the wall which is nearest the middle of the receptacle 4, is a slide or cut-off plate 6. The cut-off plate 6 is adjustably secured to the discharge spout of the hopper 5 by thumbscrews 7 which pass through slots 8 in said cut-off plate and are screwed into said discharge spout (see Fig. 5). Hinged to the lower edge of the cut-off plate 6 is a

gate 9, which is resiliently pressed downwardly by flat springs 10 secured to said gate and pressing against said cut-off plate.

The side walls and the end walls of the receptacle 4 incline inwardly and downwardly, so that said receptacle is substantially V-shape in vertical cross-section both transversely and longitudinally. The receptacle 4 is preferably constructed of two like parts which are fastened together side by side with spacing members 11 between them at each end and near the middle of said receptacle. This arrangement leaves longitudinal slots in the bottom of the receptacle between the spacing members 11. One slot 12 is located near the rear of the receptacle 4 under the discharge spout of the hopper 5. The other slot 13 is longer and extends from the middle of the receptacle 4 to the front end thereof.

Integral with the base plate 1 are bearings 14, in which is mounted a driving shaft 15. The driving shaft 15 extends longitudinally of the base plate 1 between the legs of the standards 2 and 3, and is driven by a sprocket wheel 16, which in turn is driven by a sprocket chain (not shown) connected to the machine with which the feeding mechanism is associated. The sprocket wheel 16 is preferably connected to the driving shaft 15 by a friction device which permits the sprocket wheel 16 to be turned without turning the driving shaft 15, whenever the force required to turn said driving shaft exceeds a certain amount, in order that breaking or injury of the parts of the feeding mechanism may be avoided in case the rolls become caught or jammed in the feeding mechanism.

In the particular friction device shown (see Figs. 1 and 3), the sprocket wheel 16 is loosely mounted on a sleeve 17 fixed to the driving shaft 15, said sleeve having a flange thereon which is adapted to press against one face of the hub or body of said sprocket wheel. Slidably mounted on the sleeve 17 is a friction sleeve 18, which has a similar flange adapted to press against the opposite face of the hub of the sprocket wheel 16. The friction sleeve 18 is provided with a pin 19 which fits in a longitudinal slot formed in the sleeve 17, whereby the friction sleeve 18 must turn with the sleeve 17 but may slide thereon. Encircling the sleeve 18 is a compression coil spring 20, one end of which presses the friction sleeve 18 against the sprocket wheel 16, and the other end of which bears against a collar 21. The collar 21 is screw-threaded on the sleeve 17, so that the tension of the spring 20 can be adjusted.

Integral with the rear standard 2 are two vertically spaced projections or lugs 23 (see Figs. 1 and 5); and slidably mounted in holes in said lugs is a rod 24. The rod 24

is flattened and widened at its upper end to form an agitating blade 25 which extends upwardly through the slot 12 in the bottom of the receptacle 4 near the rear thereof. The rod 24 is pressed downward by a compression coil spring 26 which is interposed between the upper lug 23 and a collar held in place on the rod 24 by a pin. The rod 24 is actuated by a rocking lever 27, one end of which is pivoted on a horizontal axis to the standard 2, and the other end of which engages the lower end of said rod. Fixed to the driving shaft 15 below the rocking lever 27 is a cam 28 which engages the under face of said rocking lever.

Near the front end of the receptacle 4 is pivotally mounted a feeding blade 29 (see Figs. 1, 2 and 4), which moves up and down in said receptacle through the long slot 13 in the bottom thereof. The feeding blade 29 is sector-shaped and has integral therewith at its point studs or pins 30 which project from opposite sides thereof. The pins 30 are journaled in the sides of the receptacle 4 near the front end thereof. The feeding blade 29 is approximately as thick as the greatest diameter of the rolls, and has in its upper edge a concave longitudinal groove which is shaped to conform to the curvature of the rolls, so that rolls may lie in said groove and be carried up by said feeding blade without danger of rolling off said feeding blade. Below the feeding blade 29 is a horizontal cam-shaft 31 which is journaled in bearings 32 integral with the base plate 1. The cam-shaft 31 is located above the driving shaft 15 and is disposed at right angles thereto. Fixed to the cam-shaft 31 is a spiral gear 33 which meshes with a mating spiral gear 34 fixed to the driving shaft 15. The cam-shaft 31 has fixed thereto a cam 35 which is located in the plane of the feeding blade 29, and which engages the bottom edge of said feeding blade. The cam 35 is shaped so as to move the feeding blade up and down as the cam-shaft 31 revolves, the feeding blade remaining stationary in its upper position for a part of each revolution of said cam.

In the front end wall of the receptacle 4 is a passage-way 36 (see Fig. 1) which is approximately as wide as the greatest diameter of the rolls. The mouth of this passage-way 36 is flared upwardly above the pivot axis of the feeding blade 29, and its side walls are vertical and are disposed alongside of the feeding blade 29. The vertical wall on one side of the feeding blade extends back into the receptacle beyond the vertical wall on the other side, and terminates in an abutment 36^a, and opposite this abutment on the other side of the feeding blade is a forwardly and upwardly slanting wall 36^b approaching the mouth. If a crosswise arranged roll slides down

the feeding blade with one end projecting so as to strike the abutment 36^a, the roll will be either turned lengthwise and discharged into the slide or tipped off on to the inclined wall or chute 36^b and returned to the receptacle 4. If a crosswise arranged roll passes the abutment 36^a its opposite projecting end will strike the opposite abutment, and when the feeding blade drops, the edge of the upwardly inclined wall 36^b will engage it and tip it off into the receptacle 4. The passage-way 36 inclines forwardly and downwardly substantially in line with the upper edge of the feeding blade 29, when said feeding blade is in its upper position. The front end of the passage-way 36 opens into a covered passage or slide 37, which is fixed at one end to a receptacle 4 and which extends forwardly and downwardly. The slide 37 is about as wide as the largest diameter of the rolls, in order that the rolls will travel lengthwise along said slide. The slide 37 is provided with a removable cover-plate 38 having a longitudinal slot therein. The slot in the cover-plate 38 enables the attendant to tell if the rolls are passing down the slide 37 properly; and if the rolls should be caught or jammed, the cover-plate 38 may be removed to give access to the inside of said slide.

The device which arranges the rolls so that they point in the same direction is mounted on a short standard 39 which is secured to the base plate 1 near the front end thereof. This turning device comprises an inclined channeled block or chute 40, which is fixed to the top of the short standard 39. The bottom of the chute 40 at its upper end is flat and constitutes a surface upon which the rolls are turned, and which will be hereinafter termed a table 41. The slide 37 is fastened to said chute 40 and delivers rolls through an opening in a side wall of said chute upon the table 41 (see Fig. 8). The chute 40 is arranged in a plane substantially at right angles to the plane of the slide 37; and the rolls are delivered from said slide 37 on the table 41 to extend transversely thereof.

Above the table 41 at the upper end of the chute 40 is a friction block 42 which is pivotally mounted at one end on a pin 43 secured in the side walls of said chute. The friction block 42 extends partway over the table 41, leaving a space near the outer end of said table and opposite to the delivery end of the slide 37 in which a roll can be placed. Secured to the chute 40 is an angle bracket 44, the upper arm of which extends crosswise of said chute and above the friction block 42. In said upper arm of the bracket 44 is screw-threaded a plug 45 (see Fig. 7), and mounted in a recess in said plug 45 is a compression coil spring 46,

which bears against the upper face of the friction block 42. The friction block 42 is provided with lugs or projections 47 which strike the side walls of the chute 40 and limit the downward movement of said friction block, the distance between the under face of said friction block and the upper face of the table 41 being less than the largest diameter of the rolls and larger than the smallest diameter of said rolls. From the inner edge of the table 41 the chute 40 inclines downwardly; and in the bottom of said chute are two concave grooves 48, which are spaced apart at their upper ends adjacent to the inner end of the table 41 and which converge downwardly. The chute 40 discharges into another chute or conveyor (not shown), which leads to the gaging machine (also not shown).

Journalled upon a pin 49 at the bottom of the short standard 39 are three hook-shaped fingers 50. The upper hooked portion of each of these fingers 50 is curved and arranged to move longitudinally of the table 41 as said finger is rocked on its axis. The middle finger 50 is comparatively narrow and is arranged to move longitudinally of the table 41 near the middle thereof, thereby engaging a roll on the table 41 in the position in which it is discharged from the slide 37 at or near the middle of said roll. The side fingers 50 are wider than the middle finger and extend from said middle finger to the sides of the table 41 so as to engage the roll on the table 41 at or near the ends of said roll. Each of the fingers 50 is pressed backward away from the table 41 by a spring-pressed plunger 51 mounted in the short standard 39. Upon the driving shaft 15 are fixed three cams 52, the two outer cams 52 being arranged to engage the two outside fingers 50, and the middle cam 52 being arranged to engage the middle finger 50. The outside cams 52 are constructed the same and cause the outside fingers 50 to take the same movements.

Secured in a wall of the receptacle 4 near the front end thereof and near the bottom of said receptacle is a hollow stud 53 (see Fig. 4), and in this stud is mounted a spring-pressed pin 54. The stud 53 has a vertical slot 55 therein, and the pin 54 is provided with a small transverse pin adapted to enter said slot. The pin 54, when projected, extends across the path of movement of the feeding blade 29. The pin 54 is provided with a knurled head by which it may be pulled out and turned.

The operation of the feeding mechanism hereinbefore described is as follows: The rolls are poured into the hopper 5 and fall by their own weight into the receptacle 4. The driving shaft 15 is driven from the gaging machine to which the feeding mechanism is attached by the sprocket wheel 16.

As the driving shaft 15 revolves the cam 28 fixed thereto raises the rocking lever 27, and the rocking lever 27 in turn lifts the rod 24 and cooperates with the spring 26 to cause reciprocation of the agitating blade 25. The agitating blade 25 as it reciprocates stirs up the rolls in the discharge spout of the hopper 5 and prevents them from clogging. By adjusting the cut-off plate 6 the size of the opening through which the rolls are discharged from the hopper 5 to the receptacle 4 can be regulated. The spring-pressed gate 9 prevents the rolls from becoming jammed in the opening between the discharge spout of the hopper 5 and the receptacle 4. The cam-shaft 31 is driven by the driving shaft 15 by means of the spiral gears 33 and 34, and the cam 35 secured to said cam-shaft 31 is rotated as the driving shaft 15 revolves. The cam 35 engages the under edge of the feeding blade 29 and rocks said feeding blade on its axis, the weight of said feeding blade causing it to press against said cam. Fig. 1 shows the lower position of the feeding blade 29 in full lines, and its upper position in dot and dash lines. As the feeding blade 29 is raised through the pile of rolls in the bottom of the receptacle 4, some of these rolls will be carried up by it, the longitudinal groove in the upper edge of said feeding blade serving to prevent the rolls from rolling off the upper edge of said feeding blade. These rolls, which are carried up by the feeding blade 29, will be arranged on said feeding blade in any way that they may happen to be picked up, and may be arranged lengthwise along said feeding blade and pointed in either direction, or even standing upright on said feeding blade, as indicated in dot and dash lines in Fig. 1. When the feeding blade 29 reaches its upper position, the rolls thereon slide down into the passage-way 36, the feeding blade remaining in its upper position for part of each revolution of the cam 35 in order to give the rolls time to slide down. The rolls move by gravity from the passage-way 36 into the slide 37 and are delivered lengthwise by said slide on the table 41 of the turning device, so that said rolls extend transversely of said table.

In order to make the operation of the turning device clear different steps in its operation with reference to one roll have been shown in Figs. 6, 7 and 9 to 14. In the Figs. 6 and 7 the parts of the turning device are shown in the position to receive a roll from the slide 37, and in this position of the parts the three fingers 50 are pushed to their outermost position by the spring-pressed plungers 51, leaving clear the space on the table 41 opposite the end of the slide 37. The first roll in the slide 37 slides by gravity on the table 41 into the position shown in Figs. 6 and 7. This roll strikes

the side wall of the chute 40 opposite the end of the slide 37, and holds back the other rolls in the slide 37. As the driving shaft 15 rotates the cams 52 fixed thereto actuate the turning fingers 50. Starting with the position of the turning fingers 50 shown in Figs. 6 and 7, the cams 52 push all three fingers 50 over the table 41. The three fingers 50 engage the roll on the table at the middle, and at both ends, and push said roll sidewise in front of them under the friction block 42, the spring 46 yielding to permit said friction block to rise. The top surface of the table 41 and the under face of the friction block 42 are substantially parallel, and consequently said friction block presses against the roll at the largest diameter thereof but does not touch said roll at other points. In the next part of the revolution of the cams 52 the two outside fingers 50 remain stationary while the middle finger 50 is advanced. As the middle finger 50 advances, it strikes the roll under the friction block 42 at or near the middle of said roll, and since said roll is held by said friction block at its largest end, said roll is turned about its larger end as an axis, (to the right or to the left depending upon the position of the roll upon the table 41), so that the smaller end of said roll points down the chute 40. In Figs. 9 and 10 the turning fingers 50 are shown in the position in which the middle finger has advanced a short distance beyond the outside fingers so as to partly turn the roll. The middle finger 50 advances until it extends alongside said roll, as shown in Figs. 11 and 12; and the roll is confined between the middle finger and one side wall of the chute 40. In the next part of the revolution of the cams 52 the two outside fingers 50 are advanced together, the middle finger remaining stationary. One or the other of the outside fingers 50 (depending upon the way in which the roll was turned) strikes the end of the roll and pushes it endwise along the table 41 against the frictional resistance of the friction block 42, until said friction block no longer presses on the roll, as shown in Figs. 13 and 14. After the roll is released from contact with the friction block 42 it slides by gravity down one or the other of the grooves 48 in the bottom of the chute 40. These grooves 48 guide the roll and prevent it from turning end for end until said roll reaches the place where the chute is too narrow for the roll to turn. The rolls slide down the chute 40 into a second chute or conveyer (not shown) and from there to the gaging machine or other machine with which the feeding mechanism is associated.

In case it is wished to stop the feeding blade 29 without stopping the driving shaft 15, the spring-pressed pin 54 is pulled out, is given a quarter turn until the transverse

pin therein coincides with the slot 55 in the stud 53, and is then released. The spring-pressed pin 54 presses against the feeding blade 29 and at the next time that said feeding blade is raised to its upper position, the pin 54 slips under the lower edge of said feeding blade and holds it up. Stopping the feeding blade 29 stops the feeding of rolls to the slide 37, but the fingers 50 continue to turn and to push rolls down the chute 40 as long as there are any rolls left in the slide 37. The movement of the feeding blade 29 may be stopped as hereinbefore described when it is desired to finish gaging the rolls already in the gaging machine, in the chute 40 and in the slide 37.

The feeding mechanism hereinbefore described is driven positively by the gaging machine with which it is associated by the sprocket wheel 16 and a sprocket chain; and the speed of the feeding mechanism is so timed with reference to the speed of the gaging machine that the fingers 50 will turn and push rolls into the chute 40 just as fast as they can be gaged by the gaging machine. The chute 40 and the chute or conveyer (not shown) into which said chute discharges are long enough to permit some variation in the rate at which the feeding mechanism can be operated without clogging the chute 40 or interrupting the supply of rolls to the gaging machine. The number of rolls which the feeding blade 29 will pick up may vary and the parts of the feeding mechanism are so arranged that said feeding blade will ordinarily deliver rolls to the slide 37 a little faster than the fingers 50 can turn them, so that there will always be some rolls in the slide 37 for the fingers 50 to turn. In case the slide 37 becomes filled, no damage will be done, because no more rolls will slide into it from the feeding blade 29.

The hereinbefore described feeding mechanism is certain and reliable in its operation. The rolls are agitated at the mouth of the discharge spout of the hopper and are not liable to become jammed or wedged in said discharge spout. The feeding blade 29 picks up the rolls regardless of how they are jumbled together in the receptacle 4, and delivers these rolls lengthwise into the slide 37. In case it happens that the rolls do not slide from the feeding blade 29 into the slide 37, the roll or rolls which are stuck will be shaken free on the next descent of said feeding blade. The slide 37 is smooth and is pitched at a steep incline so that the rolls are not liable to catch in it. As each roll is delivered to the table 41 from the slide 37 it enters a space between the ends of the turning fingers 50 and the edge of the friction block 42 which confines said roll in the proper position to be subsequently engaged by the turning fingers. However, even if

the roll should turn a little on the table 41 the subsequent operation of turning it would not be affected. As the middle finger 50 engages the roll on the table 41 at or near its middle, the pressure of the friction block 42 upon the larger end of the roll makes the turning of the roll positive; and the roll, when turned, is confined between the middle finger 50 and one side wall of the chute 40. After the roll has been turned and pushed from the table 41 the grooves 48 in the chute 40 prevent it from turning again, so that it is assured that the roll will enter the narrow part of said chute pointed in the right direction. The rolls do not have to be uniform in size or taper in order to be properly fed.

The mechanism hereinbefore described is an embodiment of the invention which is considered preferable, but considerable changes may be made in the construction shown and described without departing from the invention; and I do not wish to be restricted to the particular construction of the parts and the arrangements of the parts shown and hereinbefore described.

I claim the following as my invention:

1. A mechanism for feeding tapered rolls or the like comprising a slide or other suitable means adapted to convey rolls lengthwise, a member having a flat face constituting a table arranged under the discharge end of said slide and adapted to receive one roll from said slide, a friction block having a face arranged opposite to the surface of said table and spaced therefrom a distance less than the largest diameter of said rolls and greater than the smallest diameter of said rolls, whereby said friction block frictionally engages a roll on said table at the largest diameter thereof but does not touch the other parts of said roll, a turning finger mounted to move between said table and said friction block in a direction substantially at right angles to the direction of the movement of the rolls from said slide to said table, said turning finger being comparatively narrow and moving across said table near the middle thereof, means for removing rolls from between said table and said friction block, and means for operating said turning finger and said last mentioned means successively.

2. A mechanism for feeding tapered rolls or the like comprising a slide or other suitable means having a channel therein, the bottom of said channel having a flat face constituting a table; said channel being substantially as wide as the length of a roll, means for discharging rolls upon said table, a friction block having its under face spaced from said table a distance less than the largest diameter of said rolls and greater than the smallest diameter of said rolls, whereby said friction block engages a roll on said table at the largest diameter thereof,

but does not touch said roll at other points, a turning finger mounted to move between said table and said friction block longitudinally thereof, said turning finger being comparatively narrow and moving across said table near the middle thereof, means for removing rolls from between said table and said friction block, and means for operating said turning finger and said last-mentioned means successively.

3. A mechanism for feeding tapered rolls or the like comprising a member having a flat face constituting a table, means for discharging rolls upon said table to extend transversely thereof, three fingers movable longitudinally of said table and having a combined width substantially equal to the length of a roll, means for frictionally engaging a roll on said table at the largest diameter thereof, a chute extending from said table, and means for operating said fingers to advance said fingers together, then to advance said middle finger beyond the other two fingers, and then to advance said other two fingers, thereby turning and pushing a roll from said table into said chute.

4. A mechanism for feeding tapered rolls or the like comprising a conveyer adapted to convey rolls lengthwise, a chute having a flat face at its upper end constituting a table and located opposite the discharge end of said conveyer, said conveyer and said chute being arranged in planes disposed substantially at right angles to each other, means for pressing the larger end of a roll against said table, a turning finger movable longitudinally of said chute midway between the sides thereof, said turning finger cooperating with said last-mentioned means to turn a roll on said table about its larger end as an axis, and means for pushing rolls lengthwise from said table and downwardly into said chute.

5. A mechanism for feeding tapered rolls or the like comprising a slide adapted to convey rolls lengthwise, a chute having a flat face at its upper end constituting a table and located opposite the discharge end of said slide, said slide and said chute being arranged in planes disposed substantially at right angles to each other, means for pressing the larger end of a roll against said table, and a turning finger movable longitudinally of said chute midway between the sides thereof, and cooperating with said last-mentioned means to turn a roll on said table about its larger end as an axis into said chute.

6. A mechanism for feeding tapered rolls or the like comprising means for frictionally engaging a roll at the largest diameter thereof, a device for positively engaging a roll near the middle thereof, and means for operatively connecting said means and said device to cause relative movement of said

means and said device in a direction substantially at right angles to the axis of said roll.

7. A mechanism for feeding tapered rolls or the like comprising means for frictionally gripping a roll at the largest diameter thereof, means for feeding rolls one at a time into position to be engaged by said gripping means, a device for positively engaging a roll gripped by said gripping means near the middle of said roll, and means for operatively connecting said gripping means and said device to cause relative movement of said gripping means and said device in a direction substantially at right angles to the axis of a roll gripped by said gripping means.

8. A mechanism for feeding tapered rolls or the like comprising means for frictionally gripping a roll at the largest diameter thereof, a device for positively engaging a roll gripped by said gripping means near the middle of said roll, said gripping means and said device being operatively connected to have a relative movement in a direction substantially at right angles to the axis of a roll gripped by said gripping means to turn the small end of said roll to one side, means for releasing a roll from said gripping means without turning said roll, and means for operating said gripping means, said turning device, and said releasing means successively and in the order named.

9. A mechanism for feeding tapered rolls or the like comprising means for frictionally gripping a roll at the largest diameter thereof, means cooperating with said gripping means for turning a roll about its largest diameter as an axis, means for releasing a roll from said gripping means without turning said roll, and means for operating said gripping means, said turning means and said releasing means successively and in the order named.

10. A mechanism for feeding tapered rolls or the like comprising means for frictionally engaging a roll at the largest diameter thereof, means cooperating with said means for turning said roll about the largest diameter thereof as an axis, and means for releasing a roll from said first-mentioned means without turning said roll, all of said means being operatively connected to be operated successively.

11. A mechanism for feeding tapered rolls or the like comprising a member having a flat face, a second member having a flat face arranged opposite to the face of said first member, said members being movable relatively toward each other and being arranged so that a line extending transversely of one of said members is substantially parallel with a line extending transversely of the other member, means for pressing one of said members toward the other member

without destroying their relation, a turning finger movable between said members, means for positioning rolls between said members to extend transversely thereof, and for removing a roll from between said members without turning said roll, and means for operating said turning finger after the positioning and prior to the removal of said rolls.

12. A mechanism for feeding tapered rolls or the like comprising a member having a flat face constituting a table, and means for positioning rolls one at a time on said table, for pressing the larger end of a roll against said table, for turning said roll on said table about its larger end as an axis, and for pushing rolls from said table without turning them, in the order named.

13. A mechanism for feeding tapered rolls or the like comprising two members having cooperating faces arranged to frictionally engage a roll between them at the larger diameter of said roll, a comparatively narrow finger for engaging a roll between said members near the middle of said roll, and means for causing relative movement of said means and said finger.

14. A mechanism for feeding tapered rolls or the like comprising a member having a flat face constituting a table, means for positioning rolls one at a time on said table, means for moving a roll sidewise along said table, and means for frictionally retarding said rolls at the largest diameter thereof as they move along said table whereby they are swung around to move endwise, small end first.

15. A mechanism for feeding tapered rolls or the like comprising a member having a flat surface constituting a table, means for positioning rolls one at a time on said table to extend transversely thereof, a movable friction block having its under face substantially parallel with the upper face of said table, means for pressing said friction block toward said table without destroying the relation of their respective faces, a finger movable between said table and said friction block longitudinally thereof, said turning finger being comparatively narrow and engaging a roll between said table and said friction block near the middle of said roll, and means operatively connected with said turning finger for subsequently removing a roll from the table without turning it.

16. A mechanism for feeding tapered rolls or the like comprising two members having cooperating faces arranged to frictionally engage a roll at the larger diameter thereof without touching said roll at other points, means for engaging a roll between said members near the middle of said roll, said last-mentioned means moving in a direction substantially at right angles to the axis of said roll, a chute for conveying rolls length-

wise, and means for pushing a roll from between said members into said chute without turning said roll.

17. A mechanism for feeding tapered rolls or the like comprising a member having a longitudinal channel therein, the bottom of said channel at one end of said member being flat and constituting a table, the bottom of said channel extending downwardly from said table and having two spaced grooves therein, means for feeding rolls one at a time upon said table to extend transversely of said channel, means for moving a roll along said channel lengthwise of said table to said grooves, and means for frictionally retarding a roll at the largest diameter thereof as said roll is moved along said table.

18. A mechanism for feeding tapered rolls or the like comprising a member having a flat face constituting a table, means for discharging rolls on to said table to extend transversely thereof, three fingers movable longitudinally of said table, the combined width of said fingers being substantially equal to the length of a roll, a friction block pivoted on an axis extending transversely of said table and parallel therewith, means for pressing said friction block toward said table, means for limiting the downward movement of said friction block, and cams operating said fingers to advance the fingers together to push a roll under said friction block, then to advance the middle finger beyond the other fingers, and then to advance the other fingers to discharge a roll from under said friction block.

19. A mechanism for feeding tapered rolls or the like comprising a member having a flat face constituting a table, means for conveying rolls lengthwise to said table, means for arresting the movement of rolls from said means on said table, a friction block movable to and from said table, the surface of said table and the adjacent face of said friction block being substantially parallel, a turning finger movable between said table and said friction block in a direction substantially at right angles to the direction of movement of the rolls along said conveying means, said turning finger being comparatively narrow and engaging a roll on said table near the middle thereof, and means for pushing rolls from said table without turning them.

20. A mechanism for feeding tapered rolls or the like comprising a receptacle for containing a number of rolls, a slide leading from said receptacle and having a flaring mouth opened into said receptacle above its bottom, said slide being narrower than the length of a roll, and means for picking up a number of rolls from said receptacle and for discharging them endwise and crosswise into the flaring mouth of said slide, the

wall on one side of the mouth starting at a different point lengthwise of the slide from the wall on the other side thereof, whereby rolls arranged crosswise of said mouth are tipped off from said picking up means.

21. A mechanism for feeding tapered rolls or the like comprising a receptacle for containing rolls, a sector-shaped feeding blade pivotally mounted on a horizontal axis at its point to move edgewise up and down, the upper edge of said feeding blade having a longitudinal groove therein adapted to hold rolls arranged lengthwise, a slide leading from said receptacle and adapted to convey rolls lengthwise, the mouth of said slide having an abutment at one side and a chute leading into said receptacle opposite said abutment, the upper edge of said feeding blade in its upper position sloping downwardly and extending alongside of said abutment to the mouth of said slide, and means for operating said feeding blade.

22. A mechanism for feeding tapered rolls or the like comprising a receptacle, a hopper discharging rolls into said receptacle, a feeding blade movable vertically in said receptacle and among the rolls therein, the width of said feeding blade being substantially equal to the greatest diameter of said rolls, a slide adapted to convey rolls lengthwise, said slide having a flaring mouth with an upwardly inclined approach on one side and a vertical wall on the other, the upper edge of said feeding blade being inclined downwardly in the upper position of said feeding blade and leading alongside of said wall to the mouth of said slide, and means for reciprocating the said feeding blade.

23. A mechanism for feeding tapered rolls or the like comprising a member having a flat face constituting a table, two separate ways leading from said table, and each adapted to convey rolls lengthwise, means for positioning rolls one at a time on said table to extend transversely thereof, means for moving a roll longitudinally of said table to said ways, and means for frictionally retarding a roll at the largest diameter thereof as said roll is moving along said table.

24. A mechanism for feeding tapered rolls or the like comprising a receptacle for containing rolls, the sides and ends of said receptacle being inclined inwardly and downwardly, a slide leading from one end of said receptacle near its top and adapted to convey rolls lengthwise, a feeding blade

movable edgewise up and down in said receptacle, one end of said blade passing through the inclined end wall of said receptacle beneath said slide, said feeding blade having a longitudinal groove in its upper edge adapted to hold rolls arranged lengthwise therein, said feeding blade cooperating with said inclined end wall for discharging the rolls carried lengthwise thereby into said slide and crosswise rolls into said receptacle, and means for reciprocating said feeding blade.

25. A mechanism for feeding tapered rolls or the like comprising a receptacle for containing rolls and having an inclined bottom with a longitudinal slot in it, a sector-shaped feeding blade pivotally mounted on a horizontal axis located below the upper end of said bottom to move edgewise up and down in said receptacle through said slot, the upper edge of said feeding blade having a longitudinal groove therein adapted to hold rolls arranged lengthwise, a slide leading from said receptacle at the upper end of its bottom and adapted to convey rolls lengthwise, the upper edge of said feeding blade in its upper position sloping downwardly and extending through the end wall of the receptacle above the upper end of its bottom to the mouth of said slide, and means for operating said feeding blade.

26. A mechanism for feeding tapered rolls or the like comprising a receptacle for containing rolls, a hopper discharging rolls into said receptacle, an adjustable device for regulating the size of the discharge opening of said hopper, a feeding blade movable up and down in said receptacle, means for agitating the rolls adjacent to the discharge opening of said hopper, and means for operating said feeding blade and said agitating means.

27. A mechanism for feeding tapered rolls or the like comprising a member having a flat face constituting a table, means operating to discharge rolls upon said table, means for moving rolls along said table, and means for frictionally retarding said rolls at the largest diameter thereof as they move along said table whereby they are turned small end on.

Signed at Canton, Ohio, this 17th day of February, 1915.

JOHN F. FLAHERTY.

Witnesses:

R. E. HAYSLETT,
J. FRED STROUGH.