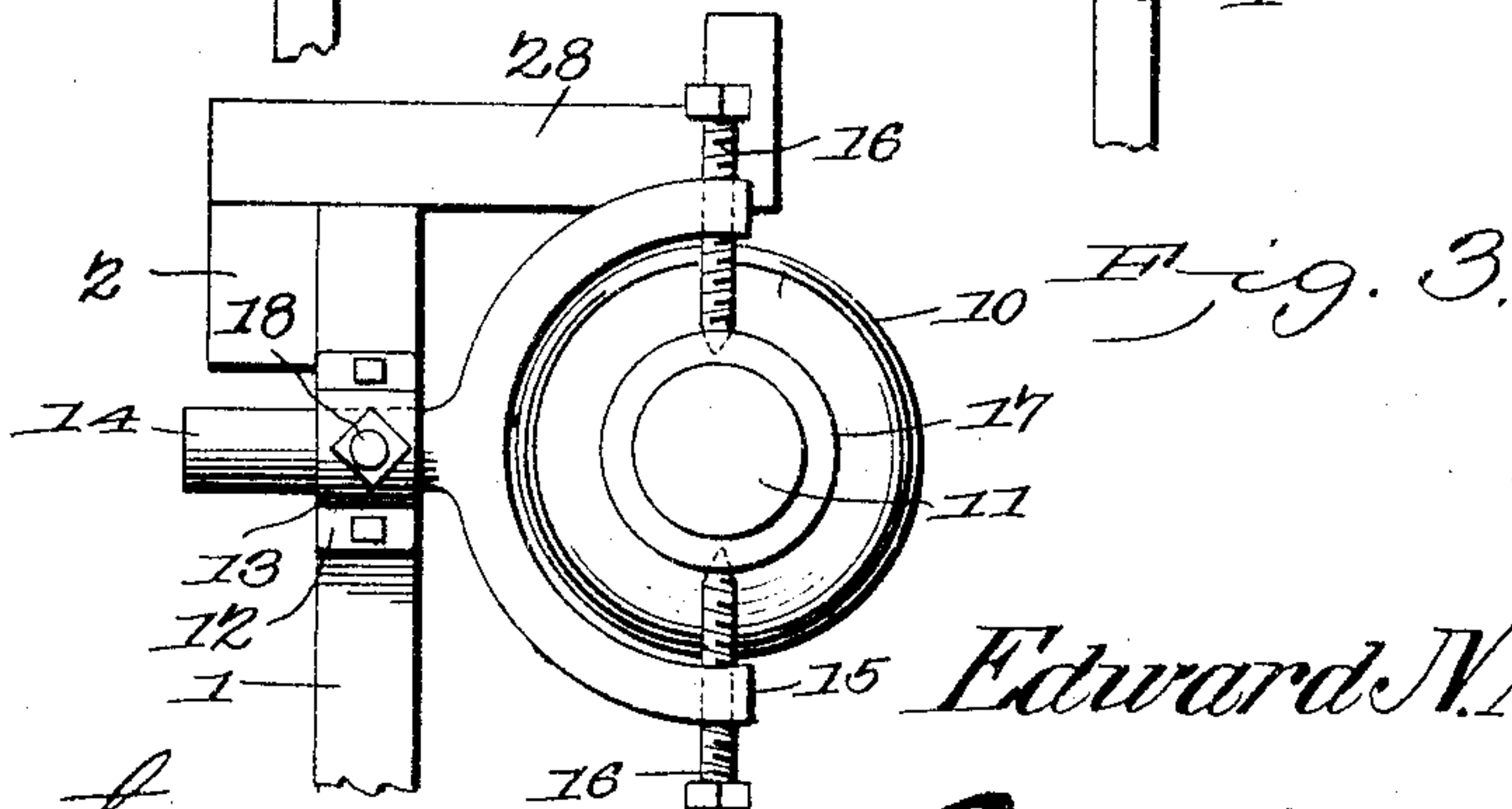
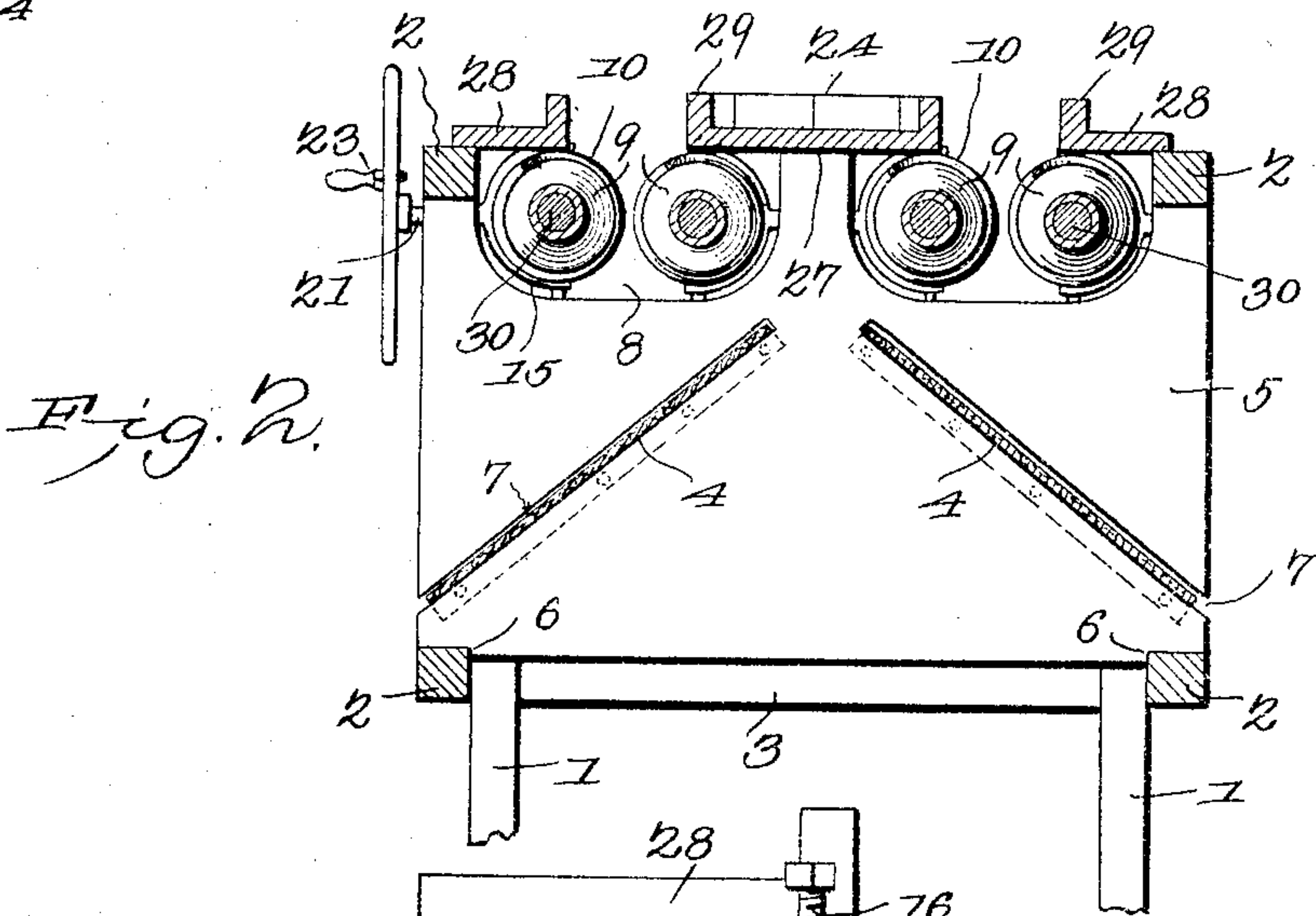
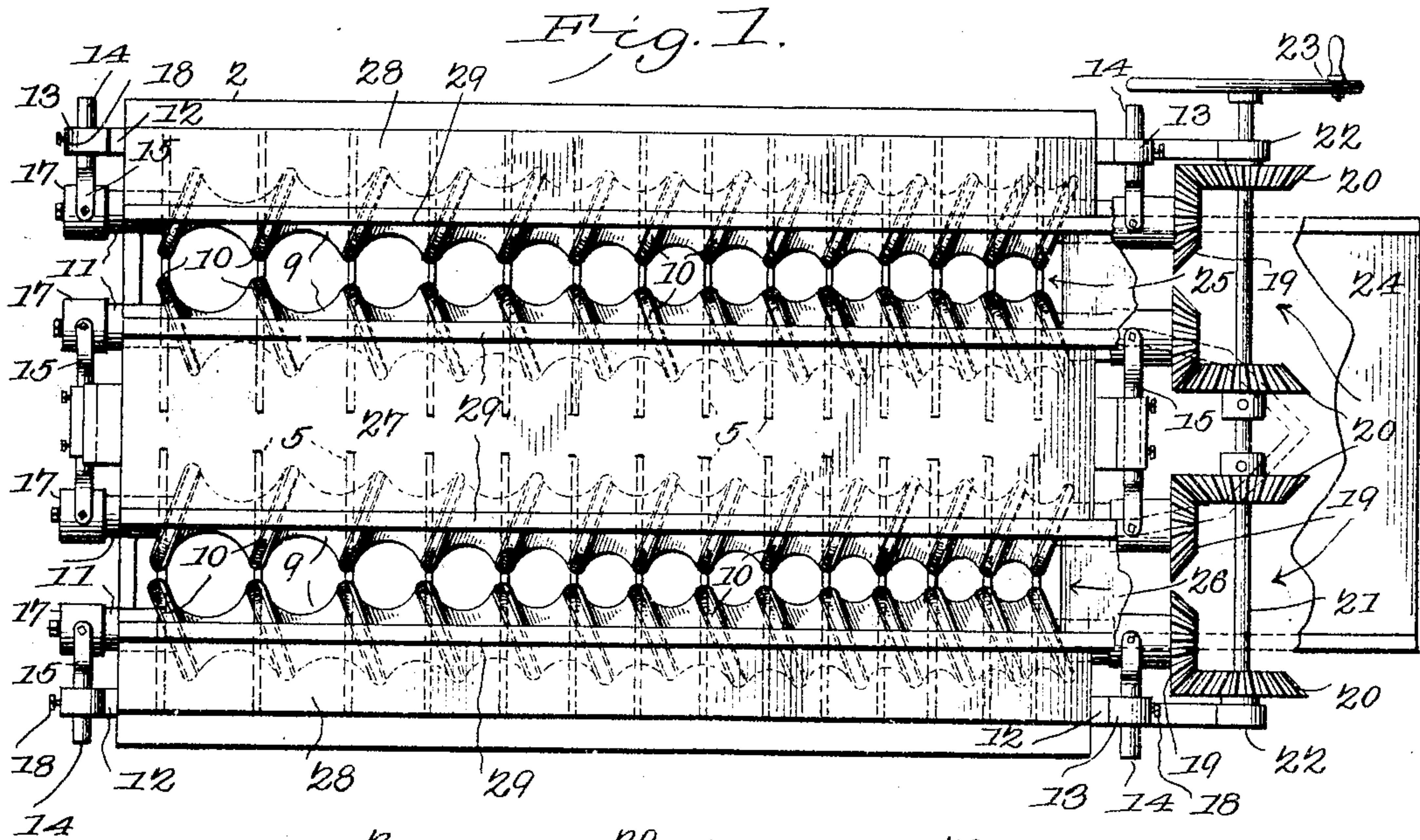


No. 785,748.

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E. N. MAULL.
FRUIT GRADER.

APPLICATION FILED JULY 14, 1904.



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UNITED STATES PATENT OFFICE.

EDWARD N. MAULL, OF CRESCENT CITY, FLORIDA.

FRUIT-GRADER.

SPECIFICATION forming part of Letters Patent No. 785,748, dated March 28, 1905.

Application filed July 14, 1904. Serial No. 216,604.

To all whom it may concern:

Be it known that I, EDWARD N. MAULL, a citizen of the United States, residing at Crescent City, in the county of Putnam and State of Florida, have invented a new and useful Fruit-Grader, of which the following is a specification.

This invention relates to grading and assorting machines, and is designed for assorting and sizing fruit, vegetables, and the like, particularly oranges. It is furthermore designed to facilitate the operation and increase the capacity of such machines and to provide for the convenient adjustment of the cooperating assorting elements, particularly to separate the same for dislodging fruit which may become wedged between the assorting elements.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will hereinafter be more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a top plan view of an assorting-machine constructed and arranged in accordance with the present invention. Fig. 2 is a cross-sectional view thereof. Fig. 3 is a detail view of the means for adjustably supporting each end of each assorting-roller.

Like characters of reference designate corresponding parts in each and every figure of the drawings.

In carrying out the present invention there is provided a substantially rectangular frame consisting of corner uprights or leg-standards 1, connected by the top and bottom longitudinal side bars 2 and the cross-bars 3, which complete the skeleton frame. The bottom of this frame is divided into opposite longitudinal members 4, which are inclined transversely downward and outward toward opposite sides of the frame and preferably formed of sepa-

rate pieces of canvas or other flexible and durable material stretched between the opposite ends of the frame and connected to the inner sides thereof. For the support of these yieldable laterally-inclined bottom sections or members there is provided a plurality of upright transverse partitions 5, each of which fits snugly between the top and bottom longitudinal frame-bars, with its bottom edge notched at opposite ends, as at 6, to receive the upper sides of the respective lower longitudinal side bars, and thereby prevent edge-wise displacement of the partition. Each partition is provided with a transverse slot or incision 7, inclined upwardly and inwardly from the lower portion of each upright edge for the snug reception of the respective bottom members, whereby the latter are supported at intermediate points and the interior of the frame is divided into a plurality of compartments. The upper edge of each partition is concaved or dished, as at 8, to accommodate the assorting-rollers. Above each bottom section there is a pair of parallel assorting-rollers 9, provided, respectively, with right and left spiral grooves increasing regularly in depth from corresponding ends of the rollers and also from the front of the machine. It will be understood that each roller has a single groove, and the two rollers are mounted mutually adjacent, thereby producing a longitudinal series of substantially circular openings therebetween, which increase regularly in diameter from the front ends of the rollers. The flange of each roller or the spiral marginal portion between the grooves is concaved throughout its outer edge to form a continuous spiral seat in which is placed a rubber band 10 to form a yieldable cushion, and thereby to obviate injury to the fruit, vegetables, or other material under treatment. Each end of each roller is provided with a journal 11, projected outwardly beyond the frame and rotatably mounted in an adjustable bearing consisting of a bracket 12, carried by the adjacent end of the frame and provided with an eye or socket 13 for the slidable reception of a stem or shank 14, carrying a fork 15, which loosely embraces the

adjacent journal. The opposite outer ends of the fork are pierced by set-screws 16, between the inner pointed ends of which is clamped a circular bearing band or ring 17 for the rotatable reception of the journal. It will here be explained that the set-screws form a pivotal axis for the bearing-ring, whereby the roller may be swung laterally in a horizontal plane upon the set-screws as a vertical axis for the purpose of separating adjacent ends of the rollers without manually adjusting the opposite ends thereof, as said opposite ends will automatically accommodate themselves to the adjustment of the first-mentioned ends by reason of the pivotal supporting of the bearing-rings. The interval between the rollers may be adjusted by sliding the stems 14 through the supporting-brackets, set-screws 18 being provided for clamping the stems against endwise movement after being adjusted.

The journals at the front of the machine project for the reception of the beveled pinions 19, which are in mesh with the respective beveled gears 20, carried by a transverse shaft 21, journaled in a suitable bearing-bracket 22, carried by the adjacent end of the frame. A suitable operating crank-handle 23 is provided at one end of the shaft for convenience in operating the assorting-rollers, and it will be understood that the gears and pinions are arranged to rotate the rollers of each set or pair outwardly in opposite directions, so as to feed the material under treatment from the front to the rear end of the machine.

A suitable hopper 24 is supported at the front end of the machine and provided with the spaced channels or guideways 25 and 26, leading to the respective pairs or sets of assorting-rollers. An intermediate top section 27 is located between the pairs or sets of rollers, and an outer top section 28 is located at the outer side of the outer roller of each set. Longitudinal fenders or guide-strips 29 are secured to the opposite edges of the intermediate top section 27 and the inner edge of each section 28, so as to constitute guards to prevent the fruit from working over the tops of the rollers when being fed along by the latter.

It will be understood that the rollers are rotated outwardly in opposite directions, as indicated by the arrows in Fig 2 of the drawings, whereby the fruit deposited in the initial or inlet ends of the grooves will follow the same or be carried thereby toward the opposite end of the frame, and when registered with such a portion of the combined grooves as is slightly larger than the particular fruit it will drop downwardly between the rollers and into the corresponding compartment formed by the adjacent canvas bottom and the adjacent partitions. It will now be observed that the partitions are arranged so as to lie at opposite sides of the substantially circular open-

ings formed by the coöperation of the flanges of each pair or set of rollers, and by reason of the lateral inclination of the bottom sections 4 the fruit will be discharged from the machine into baskets or other receptacles placed for catching the same. Moreover, the canvas bottom is yieldable, so as to protect the fruit and prevent it from becoming bruised when striking against the bottom.

Each of the rollers employed in the present machine is preferably formed of wood, with the spiral groove turned therein, and having a metallic rod 30 passing axially through the roller and projected at opposite ends thereof to form terminal journals and to prevent warping of the rollers.

In the present disclosure two sets of rollers have been shown; but it will of course be understood that I propose to increase and diminish the number of sets of rollers according to the desired capacity of the machine.

Having thus described the construction and operation of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An assorting-machine having a pair of substantially parallel assorting-rollers respectively provided with right and left spiral grooves increasing in depth from the front ends of the rollers and providing a series of openings between the rollers and increasing in size from the front ends thereof.

2. An assorting-machine comprising a frame having a longitudinal series of compartments which are open at their tops and are inclined transversely of the machine, and a pair of assorting-rollers mounted longitudinally above the compartments and respectively provided with right and left spiral grooves increasing in depth from the front end of the machine and forming a longitudinal series of openings registered with the respective compartments and increasing in size from the front of the machine.

3. An assorting-machine having a pair of substantially parallel assorting-rollers respectively provided with right and left spiral grooves increasing in depth from the front ends of the rollers and providing a series of openings between the rollers and increasing in size from the front ends thereof, and yieldable buffer-strips embracing the flanges produced by the grooves of the rollers.

4. In an assorting-machine, the combination with a frame, of a pair of spirally-grooved assorting-rollers having a groove increasing in depth from the front of the machine, bearing-brackets carried by the frame, forks adjustable endwise upon the brackets, and sockets pivotally supported between the members of the forks and receiving the journals of the rollers.

5. In an assorting-machine, the combination with a frame, of assorting means mounted thereon, a plurality of spaced upright parti-

tions forming compartments below the assort-
ing means and provided with corresponding
incisions inclined to the vertical, and a strip
of flexible material inserted in the incisions
5 and secured to the frame to form inclined
yieldable bottoms for the compartments.

In testimony that I claim the foregoing as

my own I have hereto affixed my signature in
the presence of two witnesses.

EDWARD N. MAULL.

Witnesses:

PAUL C. SMITH,
K. L. SMITH.