H. B. RITCHIE.

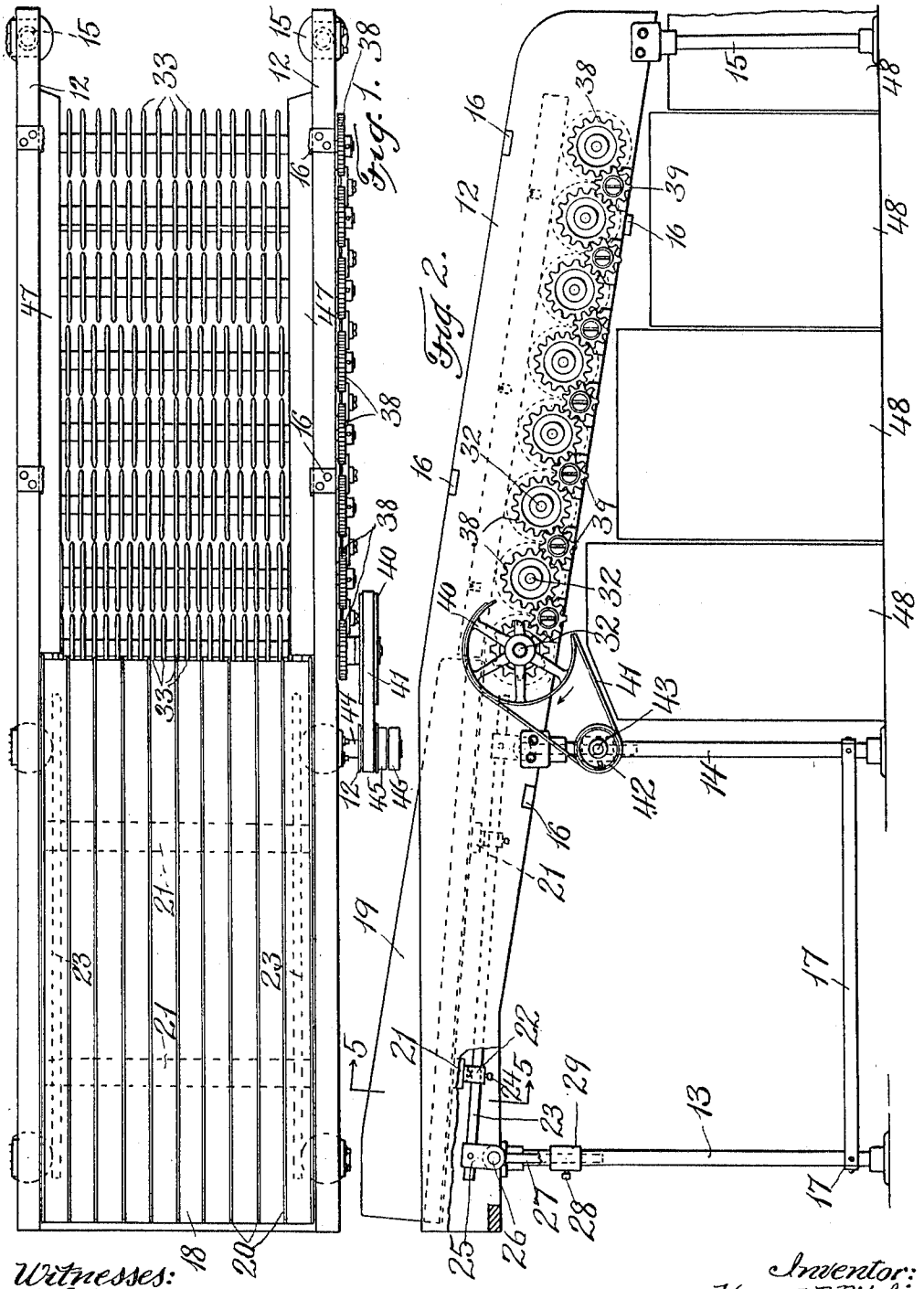
ASSORTING OR GRADING MACHINE.

APPLICATION FILED DEC. 31, 1912.

1,119,454.

Patented Dec. 1, 1914.

2 SHEETS—SHEET 1.



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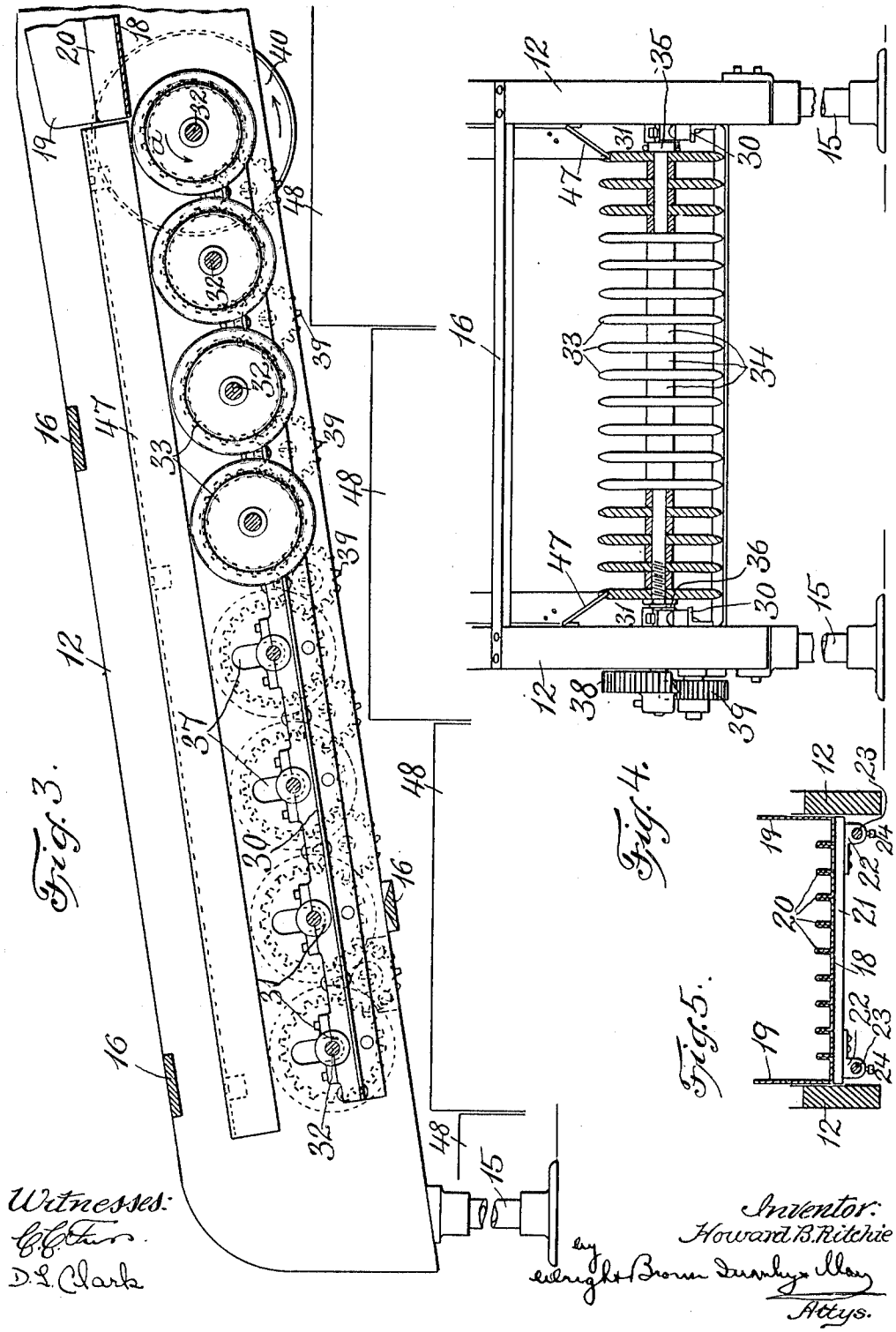

UNITED STATES PATENT OFFICE.

HOWARD B. RITCHIE, OF HYDE PARK, MASSACHUSETTS.

ASSORTING OR GRADING MACHINE.

1,119,454. Specification of Letters Patent. Patented Dec. 1, 1914.

Application filed December 31, 1912. Serial No. 739,476.

To all whom it may concern:

Be it known that I, HOWARD B. RITCHIE, a citizen of the United States, and resident of Hyde Park, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Assorting or Grading Machines, of which the following is a specification.

This invention relates to machines for separating, or sorting into different lots, articles of varying sizes delivered to the machine in mixed quantities, and has particular reference to machines adapted to assort or grade elongated bodies such as sardines or other relatively small fish preparatory to packing them.

While my invention may be used for assorting various kinds of fish, or articles other than fish, I shall hereinafter designate the articles assorted by the machine as sardines, it being understood, however, that this term is used for convenience and is not intended to be used in a restrictive sense.

One of the objects of the invention is to provide a simple and effective machine adapted to assort and grade large masses or quantities of sardines without liability of the fish becoming clogged so as to interrupt the operation of the machine.

The invention also has for its object to provide a machine of this character which shall be adjustable so that a mass of sardines may be assorted into as many grades as may be desirable, the machine being so adjustable that it is capable of delivering, in each grade, fish of any desired size.

To these ends the invention consists in the improvements which I shall now proceed to describe and claim.

Of the accompanying drawings:—Figure 1 is a top plan view of an assorting machine embodying my invention; Fig. 2 is a side elevation of the same, partly broken out; Fig. 3 is an elevation, from the opposite side to that shown in Fig. 2, of the assorting portions of the mechanism on a larger scale, parts being shown in section; Fig. 4 is an elevation of the delivering end of the machine, partly broken out or in section; Fig. 5 represents a section on line 5—5 of Fig. 2.

Similar reference characters indicate the same parts in all of the figures.

The frame of the machine comprises side members 12 which are supported by suitable uprights 13, 14, 15, said side members being suitably connected, as by cross strips or braces 16. The uprights are arranged in pairs, and the four uprights comprising the two pairs 13, 14 are preferably connected by cross strips or braces 17.

The table or platform 18, on which the sardines are deposited, is illustrated as constructed of a piece of sheet metal bent to present sides 19 and longitudinal ribs 20. I do not limit myself however to making the platform of sheet metal. Suitable cross strips 21 support the platform, said strips having ears 22 provided with apertures slidably fitting rods 23, the platform being secured in its proper position when adjusted longitudinally of the rods 23 by suitable means, such as set screws 24 passed through the ears 22 and binding against the rods 23. Each rod 23 has connected to it near each end, as best shown in Fig. 2, a yoke 25 which is pivotally connected at 26 to the upper end of a rod or bar 27 which is adjustably held by means of a clamp screw 28 in a bracket 29 secured to one of the uprights 13, 14. Each upright 13, 14, of course, has such bracket 29, and there are four vertical rods or bars 27 which are independently adjustable vertically, and consequently the two rods 23 can be adjusted as desired to provide just the right amount of inclination to enable the fish to slide by gravity toward the grading disks presently described. In practice I prefer to aid the movement of the fish down the inclined platform by supplying a sufficient amount of water. The ribs 20 of course insure the fish being guided when they move down the inclined platform, either head first or tail first, to reach the assorting disks straight and parallel. Practically it makes no difference for assorting purposes which end moves first, but it is essential that the fish shall not reach the assorting disks crosswise.

As shown by comparing Figs. 3 and 4, angle bars 30 supported by the side members 12 of the frame are provided with bearings 31 for the series of transverse parallel shafts 32. Each shaft 32 carries a series of spaced disks 33 which have blunt edges and are slightly beveled. The disks are strung upon the shafts with interposed washers or

spacing collars 34, said disks and washers being clamped between a fixed collar 35 at one end of each shaft and an adjustable nut or collar 36 at the other end of each shaft. One of these side members of the frame is provided with openings 37 to permit of the insertion of the shafts while the disks and washers are being strung thereon, and also to enable the shafts to be removed when disassembling the parts. Each shaft has a gear 38 secured to it at one end, the several gears meshing with intermediate idle pinions 39. One of the shafts is provided with a pulley 40 driven by a belt 41 from a pulley 42 on a stud shaft 43 projecting from an arm 44 (Fig. 1) extending from one of the uprights. Said stud shaft is provided with fast and loose pulleys 45 and 46 for a suitable driving belt.

Deflector plates 47 are suitably connected to the side members 12 of the frame and are inclined inwardly therefrom so as to prevent fish or water from falling upon the bearings of the shafts.

As shown in Fig. 1, the disks 33 are differently spaced, the disks of the first two shafts at the left, nearest the platform 18, being in alinement and closest together. The disks of the next three shafts are spaced in alinement, but wider apart, while the disks of the last three shafts, which are also in alinement, are spaced still farther apart. I do not limit myself to any particular number of shafts as a whole, or in each series.

In operation the sardines slide down the inclined table or platform after the latter has been properly adjusted to deliver the fish, substantially as indicated in Fig. 3, to the disks of the first shaft. All the disks rotate in the direction of the arrow *a* in Fig. 3, so that any fish which are too large to pass downwardly between the first set of disks into the first box or receptacle 48 will be advanced or drawn along by said disks and supplied to the next disks. If the fish are of proper size they will then drop through between the disks of the second set, and if they are too large they will be positively carried along to the next or final series of revolving disks. There may be as many differently spaced series of shafts and disks as may be desired, each group of assorting disks being adapted to either permit fish of proper size to pass through into a box or receptacle below, or positively advance the fish to the next wider spaced series, or entirely beyond the end of the machine, where approximately large fish will be delivered without being assorted. It will be understood that the disks perform the assorting operation without liability of the machine being clogged because the said disks are constantly rotating and are therefore obliged either to cause any fish between any two disks to pass downwardly into a box or receptacle, or to be advanced until that fish either reaches the end of the machine or a space between two disks that will permit said fish to pass through. The disks have blunt edges so that they can not cut into the fish, but at the same time the sides of their peripheries are sufficiently beveled to turn the fish so that it cannot be advanced on its side but will have either its back or its belly uppermost. In brief, the fish must pass between the disks edgewise if they are to pass at all, and it is the lateral thickness of a fish which controls the proper assorting or grading thereof. Variations of the size to be assorted may be readily effected by employing washers 34 between the disks, of such size as to insure the proper spacing of the disks. In other words, the washers may be of any size according to the size of the fish to be passed between disks spaced by such washers. As the fish pass down the inclined series of revolving disks, they are positively moved in such manner that any fish which are partly engaged but are too large to slip through the spaces between the disks of any shaft or shafts will be drawn along by the disks of the next lower shaft or shafts and either then dropped through into a box or receptacle 48 or fed still farther along the machine. As hereinbefore described, the ribs 20 of the platform 18 serve to guide the fish as they move down the inclined plane, so that said fish reach the assorting disks 33 straight, or, in other words, in parallel relationship. Since the fish are elongated in shape, if they could reach the disks crosswise, they would be liable to be carried beyond those disks which should grade them, and would be consequently deposited in a receptacle beyond their proper place. It is essential that the fish shall be started onto the assorting disks straight and parallel. It is also essential that the disks shall be peripherally smooth, because if they were not, any depressions in the disks would catch the fish and would be liable to force some of the fish down between disks not properly spaced for that particular size of fish. Moreover, serrations of the disk would be very likely to injure the fish and detract from their appearance. It is also essential that the disks, while peripherally blunt enough to not cut into the fish, shall yet have the tapered peripheries described, because if the disks had flat peripheries some of the fish would be liable to land thereupon, so as to be evenly balanced for a short time sufficient to cause such fish to be carried beyond their proper places of grading and deposited into the receptacles 48. By forming the disks with the tapered peripheries, as described, any fish landing upon them centrally will immediately tip sidewise, one way or the other, and escape down into the receptacles. The

fish cannot get turned sidewise and so pass beyond their proper places for slipping through between the disks.

Having now described my invention, I claim:

An assorting machine for elongated articles such as fish, said machine having disks provided with blunt edged peripheries the sides of which are beveled, and means for guiding the articles to the disks endwise in parallel relationship.

In testimony whereof I have affixed my signature, in presence of two witnesses.

HOWARD B. RITCHIE.

Witnesses:
A. W. HARRISON,
P. W. PEZZETTI.