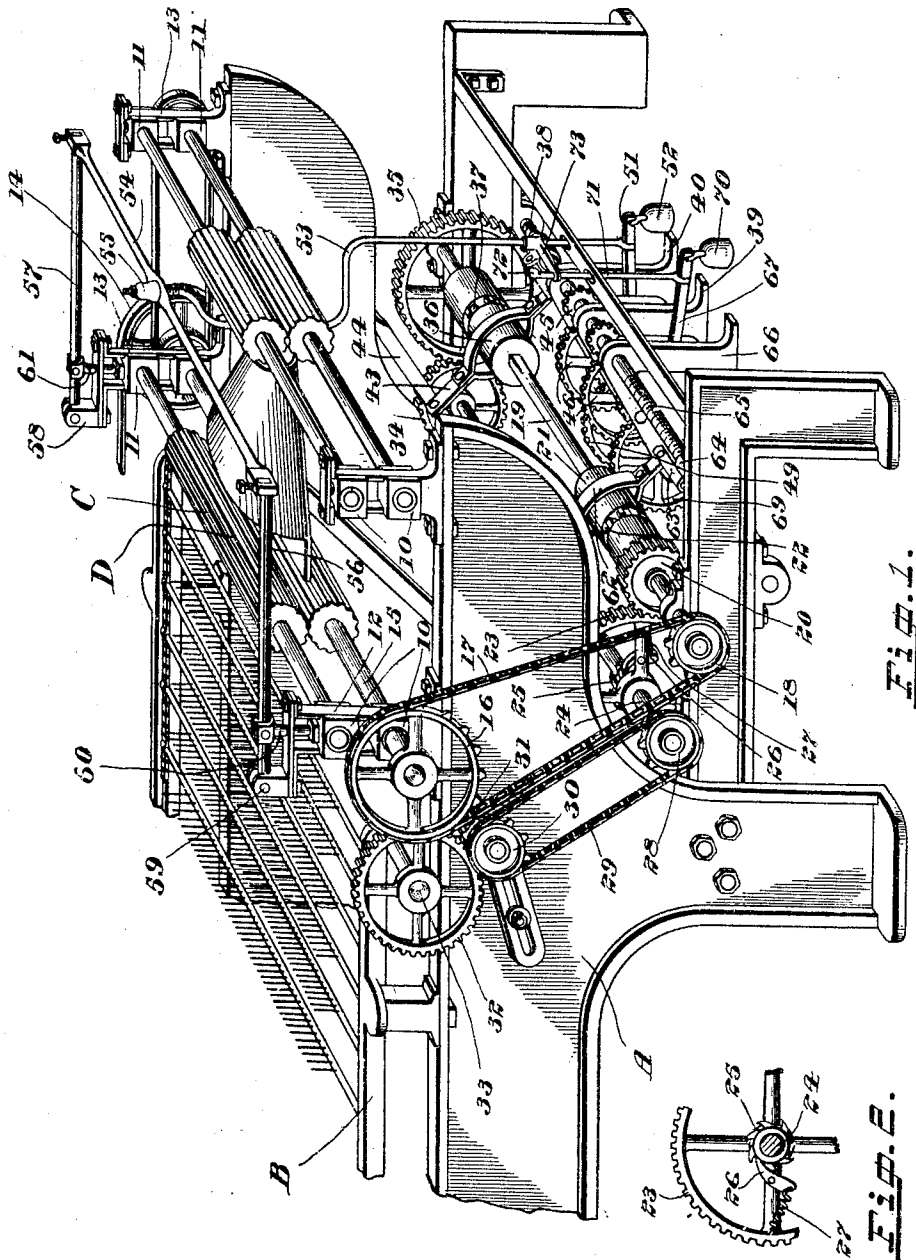


W. H. L. MELLIS.
 AUTOMATIC REGULATING DEVICE FOR BREAKERS, SPREADERS, OR THE LIKE.
 APPLICATION FILED APR. 23, 1909.

959,148.

Patented May 24, 1910.

2 SHEETS—SHEET 1.



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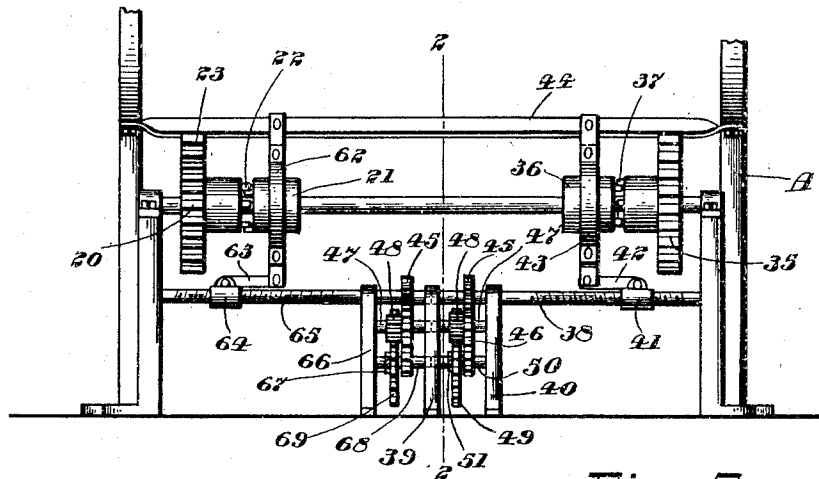


Fig. 3.

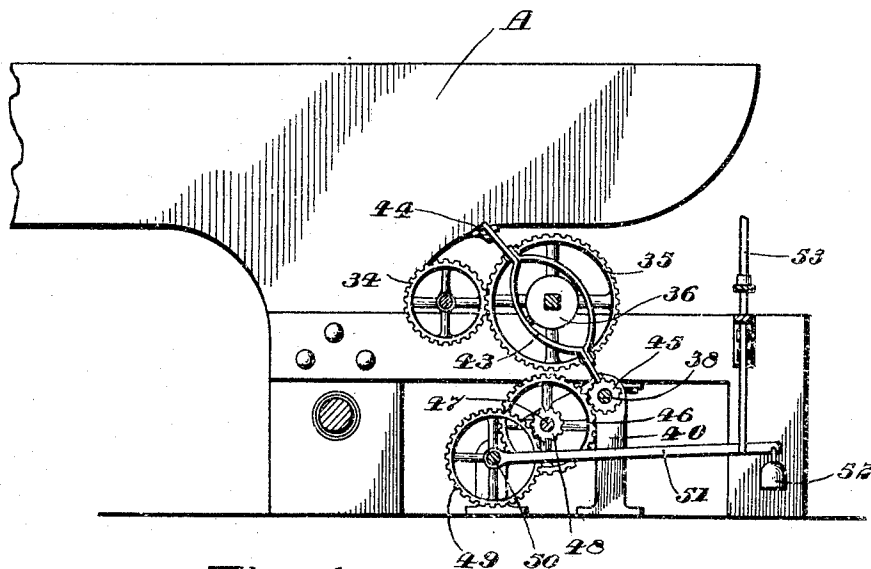


Fig. 4.

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UNITED STATES PATENT OFFICE.

WILLIAM HUME LITHGOW MELLIS, OF PETERBOROUGH, ONTARIO, CANADA.

AUTOMATIC REGULATING DEVICE FOR BREAKERS, SPREADERS, OR THE LIKE.

959,148.

Specification of Letters Patent.

Patented May 24, 1910.

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To all whom it may concern:

Be it known that I, WILLIAM HUME LITHGOW MELLIS, of Peterborough, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Automatic Regulating Devices for Breakers, Spreaders, or the Like, of which the following is a specification.

My invention relates to improvements in automatic regulating devices for breakers, spreaders or the like, such as are used in preparing the sliver for making binder twine, or rope yarn, and the objects of my invention are to provide means for making a sliver of a uniform size throughout, whereby it may be fed through the machine as uniformly as possible. This object is accomplished by providing a gear for the feeding mechanism having a normal and a fast speed, the said gear being controlled by the raising and lowering of the upper drawing roller, whereby, when the sliver becomes too thin, the lowering of the roller will throw on the fast speed, and when it becomes too thick, the feeding mechanism will be thrown out of gear until the sliver is drawn down sufficiently, the details of the invention being more fully set forth and described in the accompanying specification and drawing.

In the drawings, Figure 1 is a perspective view of a portion of the breaking and spreading machine, showing my invention applied thereto. Fig. 2 is an elevation of the main driving gear. Fig. 3 is a front elevation of the lower part of the mechanism. Fig. 4 is a section on the line 2—2, Fig. 3.

In the drawings, like characters of reference indicate corresponding parts in each figure.

Referring to the drawings, A represents the main frame of the machine, B the chain sheet for carrying the sliver to the drawing roller.

C and D represent the drawing rollers, the upper one of which is movable, this being accomplished by slidably supporting the bearing blocks 10 and 11 of the rollers in guide-ways 12 and 13. The lower drawing roller is driven by means of a pulley 14 connected to the shaft 15 supporting the roller. The opposite end of this shaft has a sprocket wheel 16 thereon connected by a chain 17 with a sprocket 18 fixed to the main shaft 19. This main shaft has a pinion 20 mounted loosely thereon, and adapted to be con-

nected to the shaft through the medium of a rotatable clutch element 21 of usual form, feathered on the shaft 19, having teeth 22 adapted to engage corresponding teeth on the hub of the pinion 20. The pinion 20 meshes with a gear wheel 23 which is loosely mounted on a countershaft 24 suitably journaled in the frame, and is adapted to be connected to the countershaft, through the medium of a ratchet wheel 25 fixed to the countershaft, and which is connected to the gear by means of a pivoted pawl 26 on the gear, held in engagement with the ratchet wheel by means of a spring 27 extending between the pawls and the gear. In this way, the speed of the shaft 24 may exceed that of the gear 23, the pawl 26 in such cases, slipping over the teeth on the ratchet wheel 25. The normal operation of the countershaft, however, is through the medium of the gear 23 with the pawl 26 in engagement with the ratchet wheel.

The countershaft 24 is suitably connected with the chain sheet as by the sprocket wheel 28 on the end of the same connected by the chain 29 and a sprocket wheel 30 connected to which is a pinion 31 meshing with a gear 32, the shaft 33 supporting which is operatively connected to the chain sheet.

To provide for the fast motion on the driving gear of the chain sheet, a pinion 34 is provided on the end of the countershaft 24, the said pinion meshing with the gear 35 on the shaft 19, the said gear 35 being loose on the shaft, but being adapted to be connected thereto by a rotatable clutch element 36, feathered on the shaft and having teeth 37 adapted to engage corresponding teeth on the hub of the gear. It will be seen that when this clutch element is in engagement with the gear, the shaft 24 will be driven at a high rate of speed, much higher than the speed of the gear 23, and consequently, the chain sheet will, through the mechanism hereinbefore described, be also operated at the high rate of speed. A suitable mechanism is provided operatively connecting the two clutches with the movable drawing roller, in such a way that when the drawing roller lowers an excessive amount, the fast motion will be thrown in and when it rises an excessive amount, the feeding mechanism will be thrown out altogether.

The mechanism for throwing the fast motion in is as follows: A screw shaft 38 is supported from one side of the frame and

from suitable standards 39 and 40, and on this screw shaft a nut 41 is mounted, which is connected by a link 42 with the end of a lever 43, the opposite end of which lever is pivoted to a fixed cross-bar 44, the center of the lever being pivotally connected to the clutch element 36. To rotate the screw shaft 38 and thereby throw the clutch in and out of gear, a pinion 45 is provided on the shaft, which meshes with a gear 46 on a countershaft 47 supported from the standards 39 and 40. Mounted on the countershaft is a pinion 48 which meshes with a second gear 49 on a second countershaft 50 supported lengthwise from the standards 39 and 40. Pivoted on the shaft 50 and connected to the gear 49 is a lever 51 normally held with its end in lowermost position, by means of a weight 52. This lever has a vertically-extending rod 53 connected to its outer extremities, the upper end of the rod being screw-threaded, and extending through a transversely-extending bar 54, being held in position against the bar by means of a nut 55. The extremities of the bar 54 are connected to the ends of levers 56 and 57, the opposite ends of which are pivoted to projections 58 and 59 on the frame, and the levers are connected intermediate of their length with bearing blocks 10 and 11 by means of connecting rods 60 and 61. In this way, when the bearing blocks are raised, the levers 56 and 57 are tilted, raising the bar 54 and the rod 53, tilting the lever 51, turning the gear 49, which turns the pinion 48 which turns the countershaft 47, turning the gear 46 which meshes with the pinion 45, which rotates the screw shaft, and moves the nut thereon until the clutch is moved out of gear.

The mechanism for throwing the chain mechanism out of gear altogether, when the upper roller rises an excessive amount, is exactly similar to that described to throw the fast motion out. The clutch element 21 has a lever 62 centrally pivoted thereto, one end of which is pivoted to the bar 44, the opposite end of which is pivoted to a link 63 connected to a nut 64 on a screw shaft 65, the screw shaft being journaled in the frame and in standards 66 and 39, but being disconnected from the shaft 38. An operating lever 67 for the screw shaft is provided, pivoted to a countershaft 68 and connected to a gear 69 on the countershaft, which gear is connected by a train of gears with the shaft 65, whereby the shaft will be turned, when the lever is raised, the lever being normally kept in lowermost position by means of a weight 70. To raise the lever a vertically-extending rod 71 is provided having a stop 72 on the upper end adapted to engage a laterally-extending arm 73, secured to the rod 53, the said arm having a perforation through which the rod 71 ex-

tends. In this way, when the rod 53 is raised an excessive amount, through the raising of the roller, the arm 73 will engage the stop 72 raising the lever 67 and moving the clutch element 21 to disengaged position, throwing the driving mechanism out of gear.

The operation of the complete device is thus as follows: When the rollers C and D are running free the clutches on both sides of the shaft 19, are in engaged position, the pawl 26 running loosely on the ratchet wheel 25. As soon as the sliver or hemp comes between the roller being fed thereto, by the chain sheet, it raises the top roller C, which raises the bearing blocks, tilting the levers 57, raising the rod 53, actuating the screw-shaft to throw the clutch element 36 out of gear, as hereinbefore described. This throws out the fast motion and limits the chain roller to run on a normal speed. Should a quantity of hemp or sliver too large for the proper purposes of manufacture, come to the rollers, the top roller is raised still higher and this causes the arm 73 to engage the stop 72, moving the clutch element 21 into disengaged position, as previously described. This causes the chain sheet to stop running and the rollers will normally draw away the hemp or sliver, and as soon as it does so, the rollers will be lowered throwing the clutch in and the normal operation will be resumed. If insufficient hemp or sliver is fed, the rollers will drop until the rod 53 is lowered sufficiently to throw the fast motion into gear, and this will rapidly feed the material until normal operation is resumed and the fast motion thrown out.

As many changes could be made in the above construction, and many apparently widely different embodiments of my invention, within the scope of the claims, could be made without departing from the spirit or scope thereof, it is intended that all matter contained in this specification and drawings, shall be interpreted as illustrative and not in a limiting sense.

What I claim as my invention is:—

1. In an automatic regulating device for breakers, spreaders and the like, the combination with a pair of rollers, one of which is movable, of a carrying element adapted to feed material to said rollers, a driving gear for the carrying element having a normal and a fast motion, means operated by the raising of the roller, a determined amount, for throwing the fast motion out of action and means operated by the raising of the rollers an excessive amount for throwing both motions out of action, both of said means including multiplying gears.

2. In an automatic regulating device for breakers, spreaders and the like, the combination of a carrying element adapted to

feed the sliver, hemp or the like, of a movable member adapted to bear on the sliver or hemp being fed, a driving shaft operatively connected to the carrying element, a gear on said shaft releasable automatically when the speed of the shaft exceeds that of the gear, means for driving the shaft, means for driving the gearing, and means thrown into operation by a raising of the movable member for throwing the gear driving the shaft out of operation, the said last mentioned means including a multiplying gear.

3. In an automatic regulating device for breakers, spreaders and the like, the combination with the carrying member adapted to feed the hemp or sliver, of a movable member adapted to bear on the sliver or like material being fed, a driving shaft operatively connected to the carrying member, a ratchet wheel fixed to said shaft, a gear loose on said shaft, having a pawl spring-held in engagement with the ratchet wheel, means for driving the gear and a fast gear connected to the shaft, and adapted to drive it at a faster rate of speed, than the gear, and means operated by the raising of the movable member a determined amount for throwing the fast gear out of operation, said last-mentioned means including a multiplying gear.

4. In an automatic regulating device for breakers, spreaders and the like, the combination with a movable roller adapted to bear on the sliver or the like, and to be raised and lowered thereby, feeding means for the sliver or the like, a driving gear for the same having fast and a normal speed, clutches respectively for the normal and fast speeds, a mechanism operatively connecting said clutches with the roller, whereby when the roller is raised a determined amount, a fast motion is thrown out of gear, and when it is raised an additional determined amount the normal motion is

thrown out of gear, said mechanism including a multiplying gear.

5. In an automatic regulating device for breakers, spreaders and the like, the combination with a feeding mechanism, a movable member adapted to bear on the sliver or the like being fed, and to be raised and lowered thereby, of a driving gear for the feeding mechanism, a clutch controlling the same, an operating lever for the clutch, a screw-shaft, a nut thereon, connected to the operating lever, a train of gears connected to the screw shaft, a lever operatively connected to one of the gears and means connecting the lever with the movable member whereby when said member is raised a determined amount, the screw shaft will be rotated to throw the clutch out of gear.

6. In an automatic regulating device for breakers, spreaders and the like, the combination with a feeding mechanism, a movable member adapted to bear on the sliver or the like being fed, and to be raised and lowered thereby, of a driving gear for the feeding mechanism, a clutch controlling the same, an operating lever for the clutch, a screw-shaft, a nut thereon, connected to the operating lever, a train of gears connected to the screw shaft, a lever operatively connected to one of the gears, vertically-extending rods connected to said lever, a transverse bar connected to said rod, pivoted levers having their ends connected to said bar and being connected intermediate of their length to the extremities of the movable members whereby when the movable member is raised a determined amount the clutch will then be thrown out of gear.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

WILLIAM HUME LITHGOW MELLIS.

Witnesses:

G. N. GORDON,
L. LEAHY.