June 14, 1932. R. W. BORROWDALE 1,863,465

AUTOMATIC JOGGER

Filed Feb. 7, 1928 2 Sheets-Sheet 1

Fig. 1.

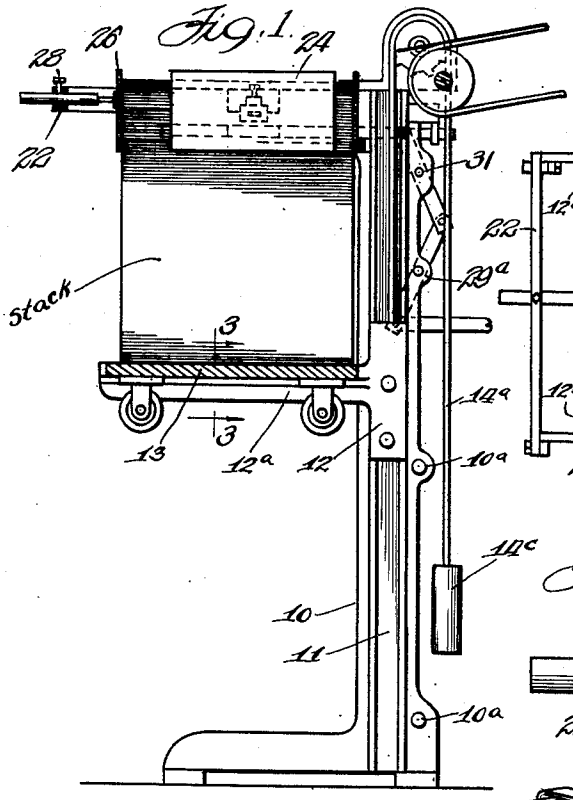


Fig. 2.

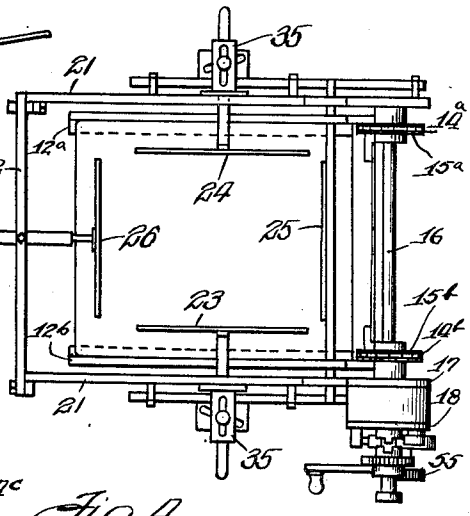


Fig. 4.

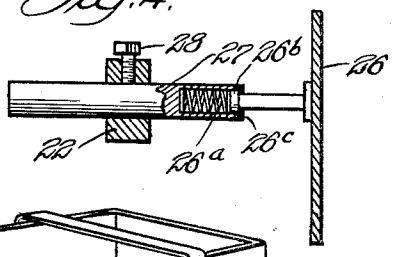


Fig. 3.

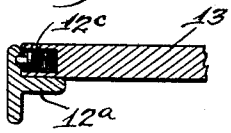


Fig. 6.

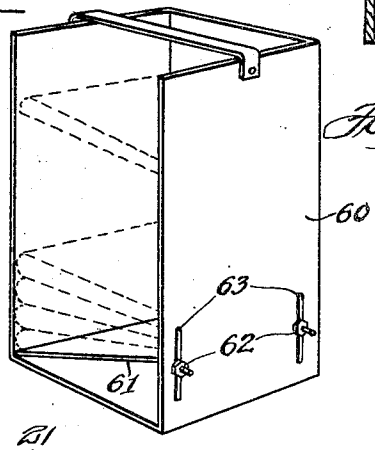
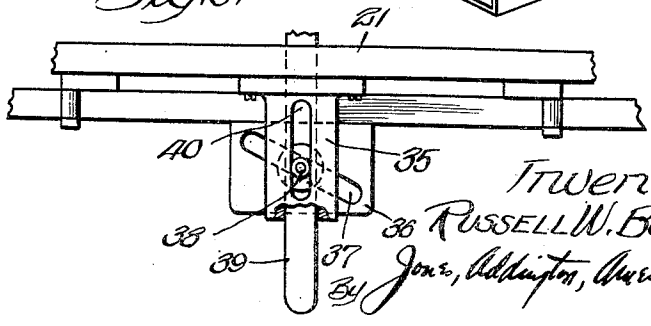


Fig. 5.



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Fig. 9.

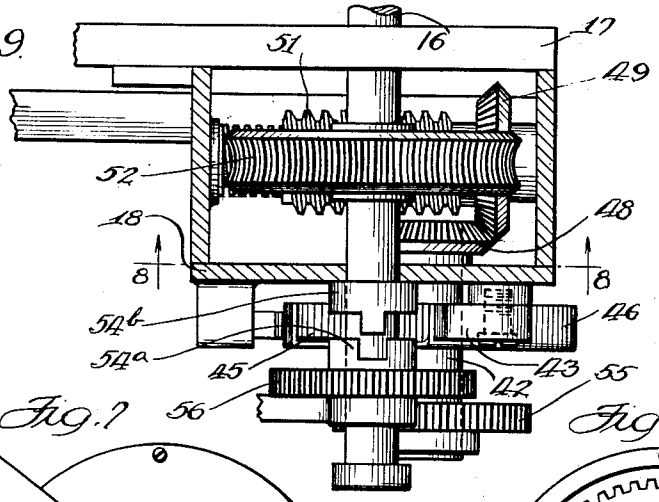


Fig. 7

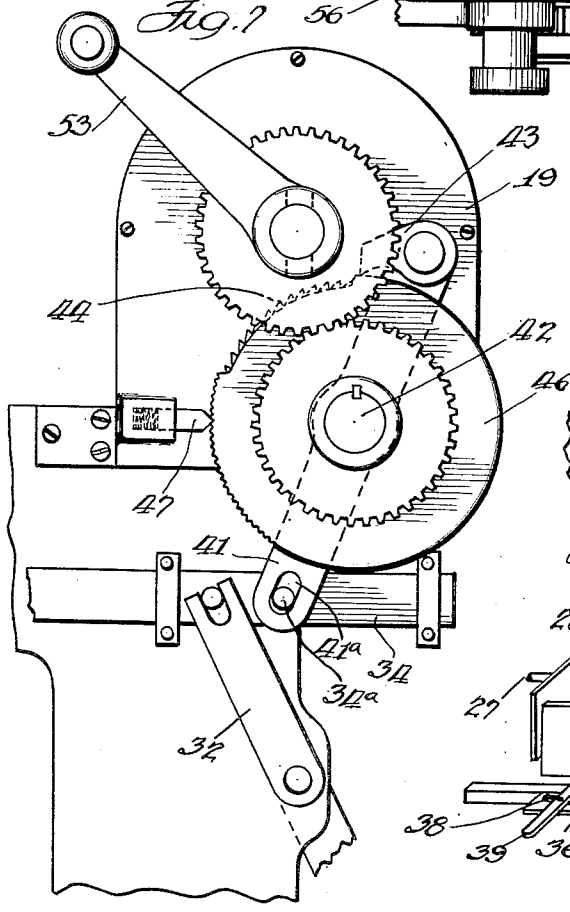


Fig. 8

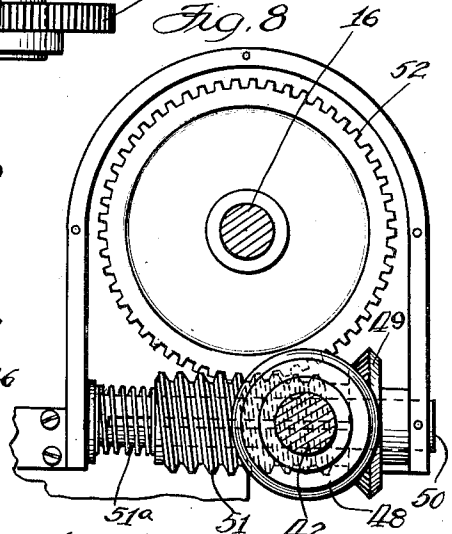
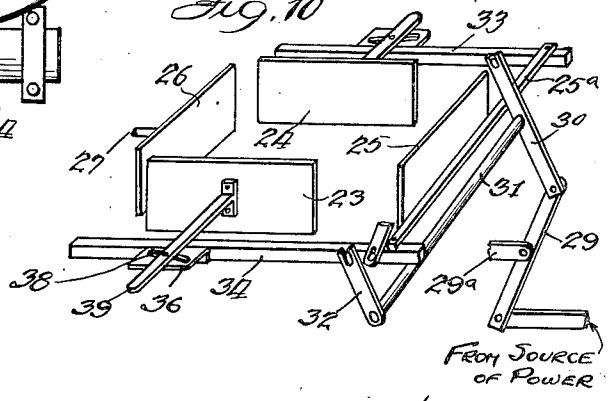


Fig. 10



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Patented June 14, 1932 1,863,465

UNITED STATES PATENT OFFICE

RUSSELL W. BORROWDALE, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE JOGGER MANUFACTURING COMPANY, A CORPORATION OF ILLINOIS

AUTOMATIC JOGGER

Application filed February 7, 1928. Serial No. 252,662.

My invention relates to automatic jogging devices, and it has particular relation to devices of the character indicated wherein jogging mechanism for accurately and neatly stacking papers piled one on top of the other may be actuated by means which at the same time provide for the proper vertical positioning of the stack.

More particularly, my invention embodies means for actuating jogging mechanism, that is to say, mechanism whereby a plurality of superimposed sheets are constrained to be stacked in a neat aligned manner in a pile. My invention at the same time provides for a vertical disposition of said pile in accordance with predetermined requirements so that as the jogging mechanism operates to stack the pile the actuating means at the same time lowers or raises the pile, as the case may be, to receive the sheets as they are placed on said pile.

In the embodiment of my invention hereinafter described I have shown it as used to receive sheets or other like articles fed into a pile from a conveyor, said conveyor being adapted to carry such sheets or articles from a printing press or the like.

While I have described for purposes of illustration my improved jogging and stacking devices as so used, it is to be understood that such description is not restricted in any sense but is merely for purposes of illustration.

Broadly speaking, my invention comprises a table upon which the sheets are to be stacked, together with a back or barrier against which the sheets move to obstruct their forward motion. Positioned on the sides of the stacked sheets and capable of being set to accommodate sheets of varying widths are what may be termed joggers, that is to say, means for lightly moving to and fro against the sides of the sheet whereby said sheets are accurately aligned with respect to their side edges. Inasmuch as the aforesaid barrier or front piece limits the forward movement of the sheet, this means thereby insures an accurate neat stack of sheets on the aforesaid supporting table.

The aforesaid jogging or stacking apparatus is synchronized or cooperatively associated with a lowering mechanism so that as the jogging is performed the supporting table is lowered to a predetermined degree, thereby insuring a correct positioning to receive the sheets as they are fed on the stack by the aforesaid conveyor.

My invention may be better understood with reference to the details thereof in connection with the accompanying drawings, in which:

Figure 1 is an elevational side view of a combined jogger and elevator embodying my invention, the same being shown for purposes of illustration as positioned adjacent the outboard end of a conveyor, which conveyor, it is to be understood, is adapted to carry sheets of paper or other material from a printing press or the like;

Fig. 2 is a plan view of the machine shown in Fig. 1;

Fig. 3 is a fragmentary sectional view showing the manner of connecting the table which supports the stack to the carrying arms;

Fig. 4 is a fragmentary view partially in section showing the manner of providing a resilient connection between two of the members;

Fig. 5 is a fragmentary plan view, somewhat enlarged, showing the manner of connecting certain of the parts illustrated in Fig. 2;

Fig. 6 is an elevational perspective view of a receiver which may be used with advantage in connection with my invention;

Fig. 7 is a side elevational view, not greatly enlarged, from one of the parts shown in Fig. 1;

Fig. 8 is another elevational view of the same elements shown in Fig. 7, but with certain of the elements and the face plate of the gear box removed, said view being taken on the line 8—8 of Fig. 9;

Fig. 9 is a plan view of the structure shown in Fig. 7 with a portion of the gear covers broken away to disclose the interior of the mechanism; and

Fig. 10 is a perspective view of the jogging elements and the associated actuating mechanism, only the joggers and the connecting

parts being shown for purposes of simplicity and clarity.

Referring now more particularly to the drawings, my invention embodies primarily two adjacent vertical standards 10 tied together by tie rods 10*a* and which are provided with opposed channel portions 11, which channel portions receive bearing portions 12 of table receiving arms 12*a* and 12*b* which latter are adapted to carry up and down a stack-supporting table 13. It will be noted that this table is in the form of a truck which may be attached to and detached from the arms 12*a* and 12*b* by means of the spring catches 12*c* and 12*d* on said arms. This permits a heavy stack of paper to be handled most expeditiously.

The table arms 12*a* and 12*b* are supported in their vertical movement by chains 14*a* and 14*b*, which chains are fed over sprockets 15*a* and 15*b* mounted on a shaft 16, the latter being journalled in side pieces 17 and 18 of a gear box 19 and the upper portion of one of the standards. Said box is illustrated more in detail in Figs. 7, 8 and 9. Said chains are provided with counter-balancing weights 14*c* and 14*d*.

Secured to the upper ends of the standards 10 is a frame comprising side pieces 21 tied together at their outer ends by a member 22. Mounted on said frame are the jogger members, that is, those members which are moved against the edges of the paper at the top of the stack to insure proper alignment of said paper. These jogger members comprise parts 23—24 to engage the sides of the sheets and a forward plate 25, which members 23, 24 and 25 are jogged against the edges of the sheets as they are stacked by the mechanism which will be hereinafter more fully described.

A stationary plate 26 is arranged to stop the forward movement of the sheets. Said plate 26 is attached to a rod 27 to permit of adjustment, the rod 27 being secured in adjustable relation to the back-frame piece 22 by a set screw 28.

As indicated in the plan view of the jogging mechanism, said back-plate 26 is secured in resilient telescoping relation to the rod 27. Between the telescoping portions just mentioned is a spring 26*a* which permits the back-plate to be slightly moved by sheets which may, through irregular cutting, be longer than the predetermined length of a sheet. After said plate is moved to accommodate such an over-sized sheet it is again moved back to correct aligning position by the action of said spring 26*a* and the limiting of collars 26*b* and 26*c*.

An actuating member 29 is arranged as shown in Fig. 1 to be moved from some to-and-fro moving member on the press or other device with which my stacking apparatus is associated. Said member 29 is secured to and moves a pivoted arm 30. The arm 30 is rigidly secured to a shaft 31 so that oscillation of said arm 30 rocks said shaft 31, and in similar manner oscillates an arm 32 secured to said shaft 31 at another side of the stacking apparatus.

Jogging rods 33 and 34 are secured to the upper ends of arms 30 and 31 and are moved by the oscillating of said arms through bearing portions 35—35, which latter are secured to the side frame pieces 21—21, as best seen in Fig. 5. Actuating blocks 36 are secured to said jogging rods 33 and 34 and are each provided with an actuating slot 37 to receive pins 38. Said pins 38 are secured to members 39, which latter are attached to the backs of the side plates 23 and 24.

Said pins 38 extend upwardly into slots 40—40 in the bearing portions 35—35 so that when the jogging rods 33—34 move to-and-fro, the action of the slanting slots 39 and the pins 38 cause the members 40—40 to move perpendicularly to the edges of the paper and thus jog plates 23 and 24 against the edges of the sheets of paper as the latter are fed into the top of the stack. The forward jogger 25 is secured to said rods 33—34 by a connecting member 25*a* so that said part 25 is also synchronously moved to align the sheets, it being noted that the sheets, as they come from the conveyor are fed over said jogger 25 and into the stack and are then jogged in four mutually perpendicular directions.

One of the side jogging rods 34 actuates through a pin 34*a* and a slot 41*a* a pivotally mounted pawl-carrying arm 41, said arm 41 being mounted around a shaft 42, the further purpose of which will be hereinafter more fully described. As the rod 34 moves the lower end of said arm 41, a pawl 43 pivotally mounted on the upper end of said arm engages with teeth 44 on a rotary or circular ratchet member 45 and moves the latter and the shaft 42. The number of teeth which said pawl 43 may engage, and therefore, the amount of movement imparted in step-by-step manner to the gear 45, may be predetermined by the correct positioning of a shroud 46 which is positioned over the teeth on the ratchet 45. This shroud is apertured to permit the projection therethrough of the teeth 44, as shown, and may be rotarily adjusted in any predetermined position by being moved against the action of a spring biased catch 47.

Secured to the same shaft 42 as that upon which member or circular ratchet 45 is mounted is a bevel gear 48 which, in turn, meshes with another beveled gear 49. Said gear 49 is secured to a shaft 50 carrying a worm 51, said worm 51 meshing with a gear wheel 52 which is secured to the same shaft as that upon which the sprockets 15*a*–15*b* are mounted so that as the step-by-step movement is imparted to the train of gears just

described, the chains 14—14 are fed to permit the table to move downward.

From the above it will be apparent that I have eventuated a new and novel jogger and table positioning apparatus in which the joggers and the table-lowering mechanism are actuated from a common source in an efficient and expeditious manner.

The worm is spring biased to the right so that a manual turning of the gear 52 in a direction reverse to the normal pitch forces said worm out of engagement and permits the rapid movement of sprockets 15*a* and 15*b* and the chains 14*a* and 14*b* to elevate said table. Spring 51*a* provides for such disengagement upon the movement of a handle 53 and the engagement of clutch comprising parts 54*a* and 54*b*. The pushing in of said handle connects parts 54*a* and 54*b* whereupon rotation of the handle 53 rotates said shaft.

Another direct movement of the table is provided for by mounting an out-board gear 55 on shaft 42 and a gear 56 on shaft 16 so that pulling out of handle 53 engages said gears 55 and 56 and permits direct movement of beveled gears 48 and 49 to raise or lower said table manually.

As before indicated, the table can be gradually lowered in synchronized relation to the feed of sheets to the stack, the said sheets being jogged into a neat and accurate pile as they are fed to the table. When the table is full the spring catches are disengaged and the table rolled off the arms. This particular combination is of great importance in the desirability of my device.

I also provide a novel receiving means to be carried on the table when booklets and envelopes or like articles which are thicker at one edge than the other are to be stacked. Said means comprises an open front box 60 having a biased piece 61 in the bottom thereof which piece may be adjustably secured in the bottom of the box by holding means 62 adjustable along slots 63 in the side of the box to insure even stacking of articles having one edge thicker than the other. The piece 61 is so arranged that the articles are fed into the case with the thicker edges adjacent the lower side of the piece with the result that the topmost article in the stack will be substantially horizontal, as indicated in dotted lines.

While I have described but one embodiment of the elements whereby my novel invention is practiced, it will be understood that the same is illustrative only of the principles which I hereafter claim, and I desire therefore, that my invention be limited only by the said appended claims or the showing of the prior art.

Having described my invention, what I claim as new therein and desire to secure by Letters Patent of the United States, is as follows:

1. The combination with a sheet stacking apparatus having a stack-supporting table and jogging means for successively aligning the edges of sheets being stacked, of a table lowering mechanism comprising a rotatable shaft operatively connected to and for vertically moving said table, manual means for directly engaging said shaft, a second rotatable shaft geared to said first mentioned shaft, means for automatically disengaging said first and second shafts upon rotation of said manual means in one direction, a pivotally mounted actuating arm, a pawl mounted thereupon, a ratchet wheel fixedly mounted on said second shaft, a shroud adjustable on said ratchet wheel to predetermine the number of teeth thereof which are engageable by said pawl, and a reciprocating arm for direct connection with said actuating arm and said jogging means.

2. The combination with a sheet stacking apparatus having a stack-supporting table and jogging means for successively aligning the edges of sheets being stacked, of a table lowering mechanism comprising a rotatable shaft operatively connected to and for vertically moving said table, a worm gear thereon, a spring biased worm for engaging and for operating said worm gear, actuating means for said worm, and manual means for engaging said rotatable shaft whereby said worm is automatically forced out of engagement with said worm gear to provide a direct actuation of said rotatable shaft.

3. The combination with a sheet stacking apparatus having a stack-supporting table and jogging means for successively aligning the edges of sheets being stacked, of a table lowering mechanism comprising a rotatable shaft operatively connected to and for vertically moving said table, a worm gear thereon, and a spring biased worm fixed to and slidably mounted longitudinally on a second shaft, actuating means for said second shaft, and manual means for engaging said first mentioned shaft whereby when said shaft is rotated in a direction reverse to the normal direction of pitch of said worm forces a disengagement thereof with said worm gear to provide a direct actuation of said rotatable shaft.

4. The combination with a sheet stacking apparatus having a stack-supporting table and jogging means for successively aligning the edges of sheets being stacked, of a table lowering mechanism comprising a rotatable shaft, means carried by said shaft for connection with and vertical operation of said table, a second rotatable shaft, an engaging worm gear and worm mounted respectively on said first and second shafts, a third rotatable shaft geared to said second rotatable shaft, a ratchet wheel mounted on said third shaft, actuating means for said ratchet wheel, a shroud adjustable on said ratchet wheel to

predetermine the engagement therewith of said actuating means, and a reciprocating arm for direct connection with said actuating means and said jogging means.

5. The combination with a sheet stacking apparatus having a stack-supporting table and jogging means for successively aligning the edges of sheets being stacked, of a table lowering mechanism comprising a rotatable shaft operatively connected to and for vertically moving said table, a second rotatable shaft geared to said first mentioned shaft, a pivotally mounted actuating arm, a pawl mounted thereupon, and a ratchet wheel and a gear fixed on said second shaft, manually operated means for engaging said gear, a shroud adjustable on said ratchet wheel to predetermine the number of teeth thereof which are engageable by said pawl, said gear being alternatively actuated by either said pawl or said manually operated means, and a reciprocating arm for direct connection with said actuating arm and said jogging means.

In witness whereof, I have hereunto subscribed my name.

RUSSELL W. BORROWDALE.