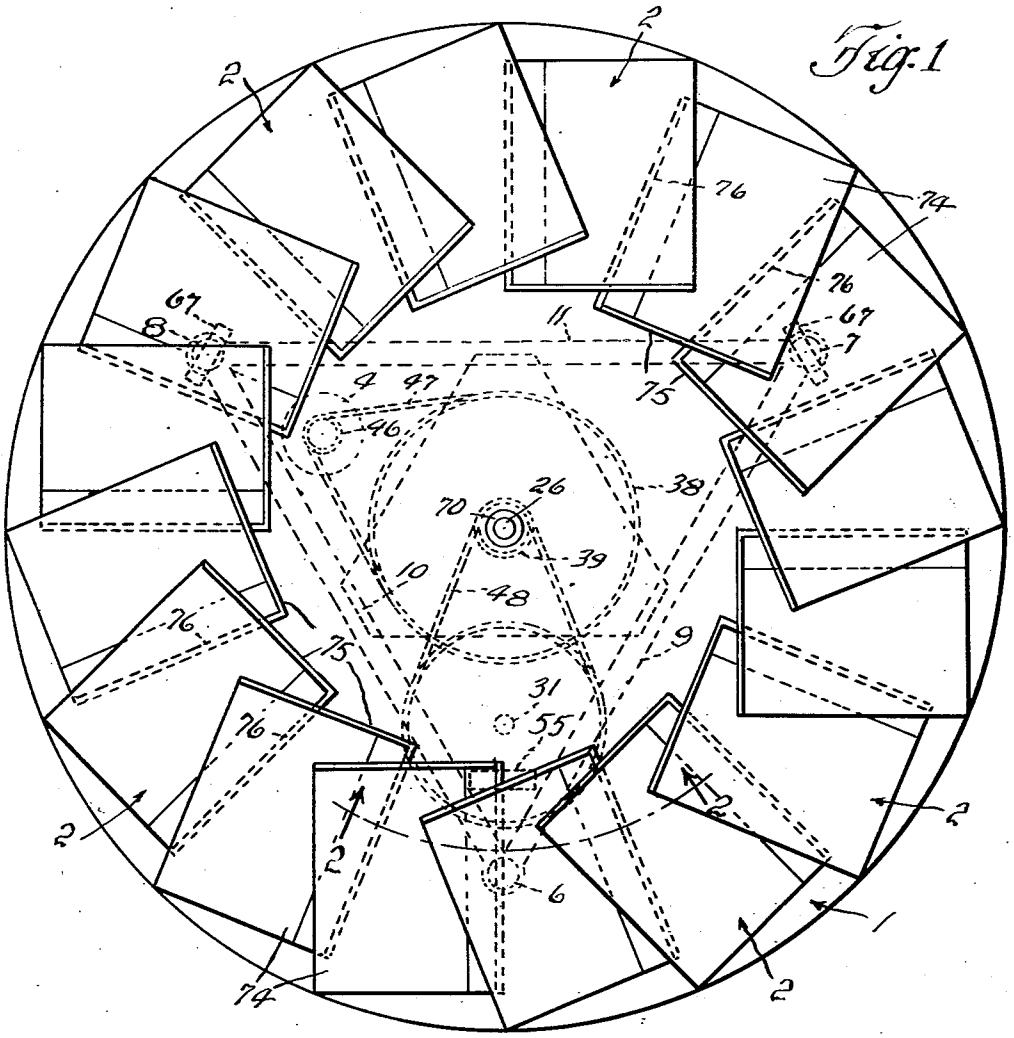
July 16, 1957 R. ALLENBAUGH 2,799,496

COLLATING MACHINE

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Fig. 1



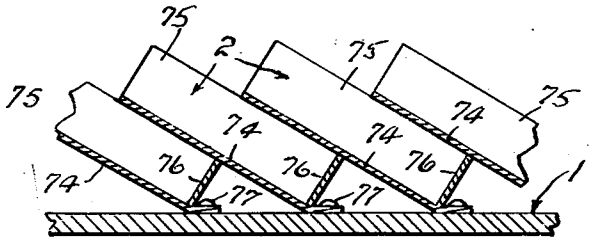


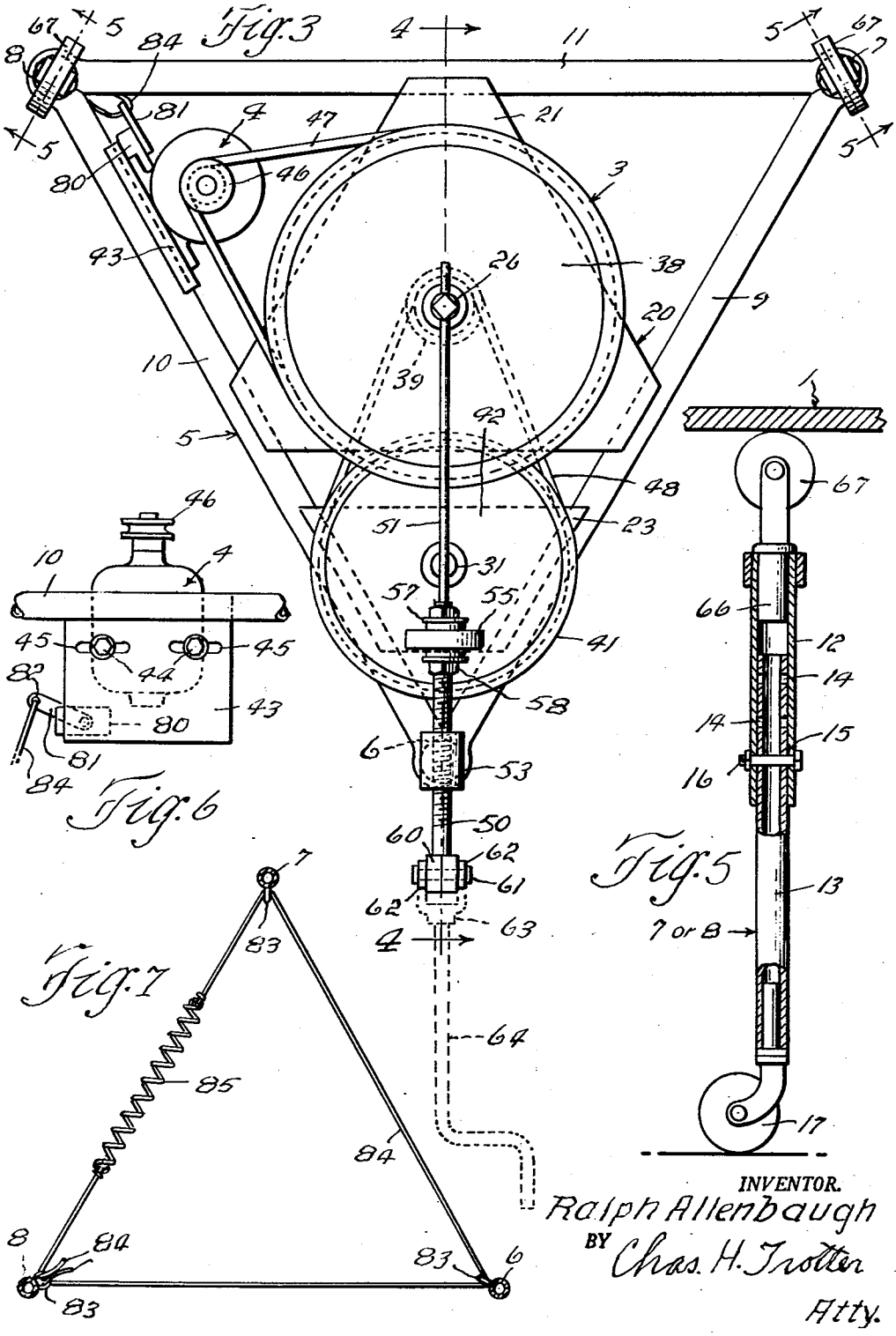
Fig. 2

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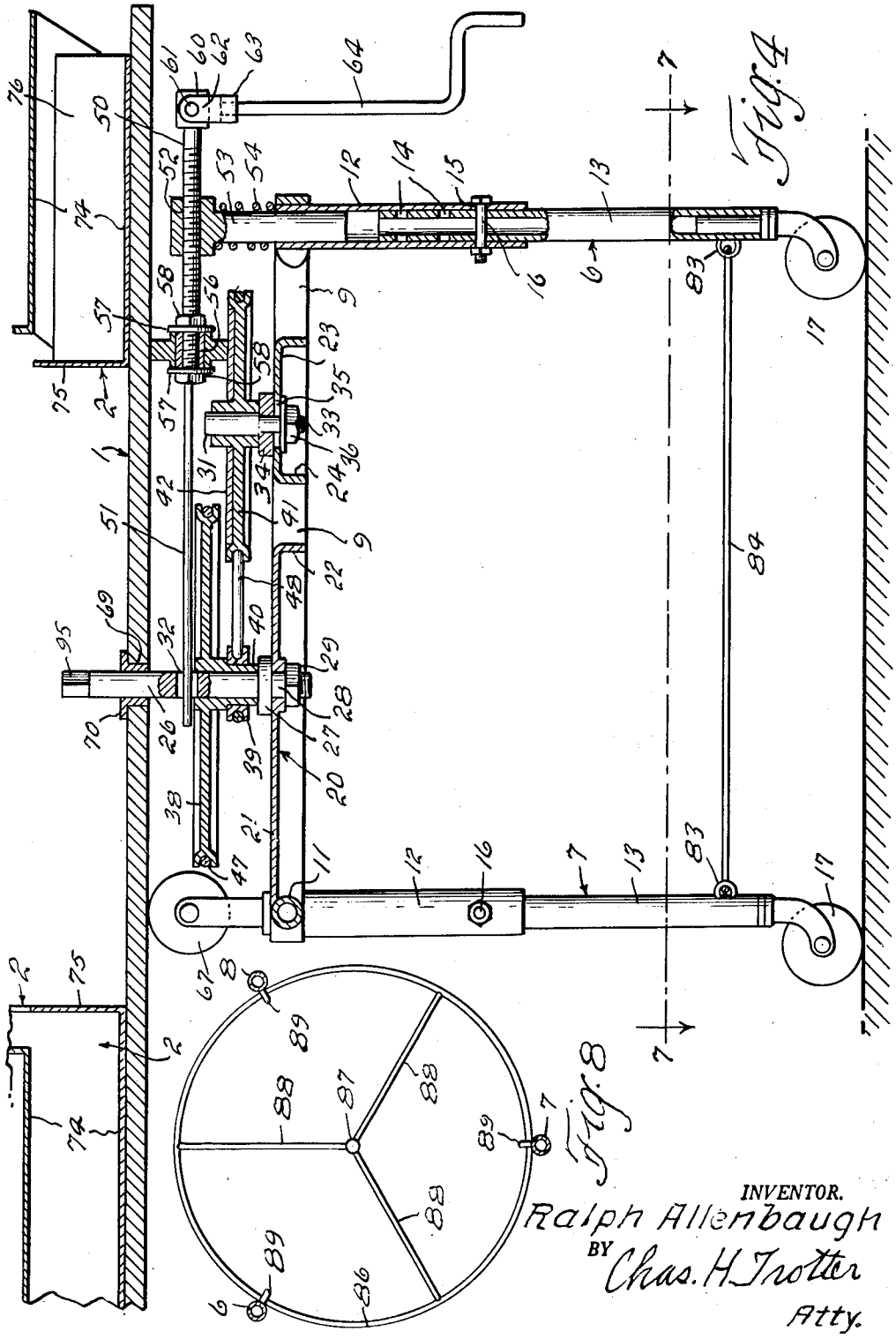


Fig. 4

Fig. 8

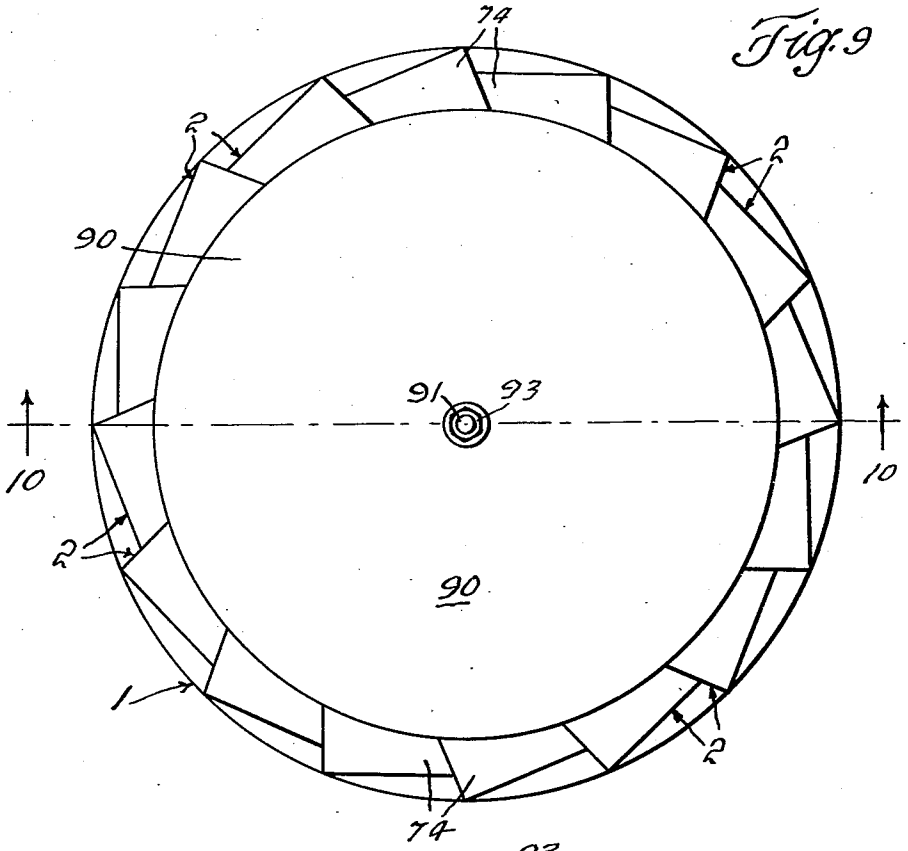
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July 16, 1957 R. ALLENBAUGH 2,799,496

COLLATING MACHINE

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Fig. 9



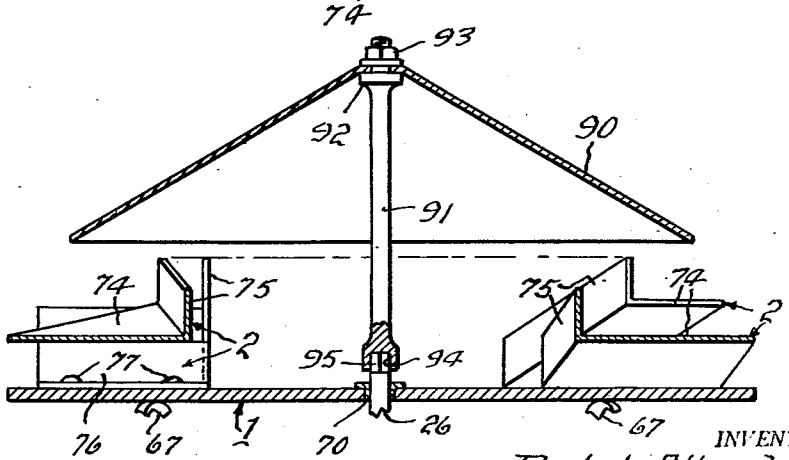


Fig. 10

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COLLATING MACHINE

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24 Claims. (Cl. 270—58)

This invention relates to a collating machine for use in collecting together successive pages of catalogs, pamphlets and/or other similar printed matter for binding or otherwise securing together. It is especially adapted for collecting together the successive pages of what are generally known as loose-leaf catalogs, advertising pamphlets and instruction books which have a relatively small number of pages, although it can be used equally well with pamphlets or the like having a relatively large number of pages. The machine is of special utility in job printing shops and with manufacturers who are continually sending out large numbers of catalogs and advertising pamphlets.

Heretofore the general practice has been to place the successive pages of a pamphlet or the like in successive stacks on a long table and have one or more collators walk around the table and pick successive pages from successive stacks, which is a very slow and laborious task.

My collating machine greatly expedites the collating of successive sheets or pages of a pamphlet or the like and materially reduces the slow tedious work incident thereto by moving successive stacks of sheets past one or more collators who may remain comfortably seated and withdraw sheets from the top of successive stacks as the stacks are moved slowly past them.

My new and improved collating machine comprises generally a turn-table having a plurality of trays or pockets mounted thereon in an annular row adjacent the periphery thereof. The turn-table is rotatably mounted upon a suitable stand which is adjustable vertically in order to comfortably accommodate the turn-table to collators using the machine. Suitable motor actuated mechanism through which the turn-table is slowly rotated is mounted upon the stand under the turn-table and has incorporated therein means by which the speed of rotation of the turn-table may be varied or adjusted as desired. The stand is preferably mounted upon castors, so that the machine may be easily moved from place to place. Means are also provided by which anyone of several operators simultaneously using the machine may start and stop the rotation of the turn-table whenever they desire to do so. In use stacks of the different pages of a pamphlet are successively placed in successive trays or pockets on the turn-table, it being understood that each stack consists of a multiplicity of the same pages. Then as the turn-table is rotated a collator at a station will pick a page from each successive pocket as the pockets are moved past him. The number of successive pages that can be collected by a collator during each revolution of the turn-table is dependent upon the number of trays or pockets on the turn-table which in turn is dependent upon the diameter of the turn-table. The number of collators that can be simultaneously accommodated by a machine is also dependent upon the diameter of the machine.

The principal object of the invention is to provide a collating machine which will greatly expedite the collecting together of the successive pages of catalogs, pamphlets and like publications and which will materially reduce the tedious and tiresome labor incident thereto.

Another object of the invention is to provide a machine of the aforesaid character which is efficient in operation, is of simple construction, is relatively inexpensive to manufacture and which will give long uninterrupted service without requiring adjustment or repair.

Another object of the invention is to provide an improved collating machine which includes a turn-table and means by which the turn-table can be vertically adjusted in order to best accommodate it to the stature of an operator using the machine.

Still another object of the invention is to provide an improved collating machine having a turn-table and means by which the speed of rotation may be varied as desired.

A still further object of the invention is to provide an improved collating machine which may be simultaneously used by several operators and which includes a turn-table and means by which the rotation of the turn-table may be started and stopped as desired by anyone of the several operators independently of the other operators.

Other and more limited objects of the invention will be apparent from the following specification and the accompanying drawings forming part thereof which disclose one embodiment of my invention and in which:

Fig. 1 is top plan view of a collating machine embodying my invention;

Fig. 2 is a detail section taken on the line 2—2 of Fig. 1 showing the overlapping arrangement of the trays or pockets;

Fig. 3 is a plan view, on a slightly larger scale, showing the machine with the turn-table removed;

Fig. 4 is a vertical sectional view through the machine, the plane of the section being indicated by the line 4—4 on Fig. 3;

Fig. 5 is a detail vertical section taken on either of the lines 5—5 of Fig. 3;

Fig. 6 is a fragmentary detail view in elevation showing the manner of adjustably mounting the driving motor upon its supporting plate;

Fig. 7 is a detail horizontal section on a reduced scale, the plane of the section being indicated by the line 7—7 on Fig. 4;

Fig. 8 is a view similar to Fig. 7 showing another form of switch actuating means;

Fig. 9 is a plan view of the machine showing a stationary shield thereover which keeps an operator from seeing the major portion of the turn-table as it rotates; and

Fig. 10 is a fragmentary vertical section taken on the line 10—10 of Fig. 9.

Referring now to the drawings by reference characters my improved collating machine comprises generally a turn-table 1 having a plurality of trays or pockets 2 permanently secured thereon, driving means 3 including an electric motor 4 by which the turntable is rotated, and a stand generally indicated by the numeral 5 upon which the turn-table and the driving means therefor are mounted.

The stand 5 is preferably built up of metal tubing and comprises the legs 6, 7 and 8 which are arranged in an equilateral triangle and are rigidly connected together by the struts 9, 10 and 11 which are welded or otherwise permanently secured to and between the upper ends of the legs 6, 7 and 8. As shown the strut 9 is connected to and between the legs 6 and 7, the strut 10 is connected to and between the legs 6 and 8, and the strut 11 is connected to and between the legs 7 and 8. Each of the legs 6, 7 and 8 comprises an open-ended vertically disposed tubular sleeve 12 having a tubular extension 13 telescopically mounted in the lower end

thereof for vertical adjustment. The upper ends of the extensions 13 are provided with a plurality of pairs of aligned apertures 14 which are adapted to be selectively brought into register with a pair of aligned apertures 15 in the lower ends of sleeves 12. A pin bolt or the like 16 which is adapted to be inserted through the pair of apertures 15 and the registering pair of apertures 14 is provided to maintain the extension 13 in adjusted position. A castor 17 is removably secured in the lower end of each of the extensions 13, to facilitate the movement of the machine from place to place when desired.

A centrally disposed spider 20 which comprises a triangular plate 21 having downturned stiffening flanges, is welded to and between the struts 9, 10 and 11; and a plate 23, having downturned stiffening flanges 24, is welded to and between the struts 9 and 10 adjacent the leg 6. An upwardly extending vertically disposed stud 26 having a collar 27 thereon is mounted in an aperture 28 in the plate 21 of the spider 20 and is held in position by a nut 29 on the lower threaded end thereof. An upwardly extending vertical stud 31 having a reduced threaded lower end 33 on which is removably mounted a collar 34, is adjustably mounted in an elongated slot 35 in the plate 23 and is clamped in adjusted position by a nut 36. The stud 26 is preferably located at the geometric center of the triangle formed by the legs 6, 7 and 8.

A relatively large grooved pulley 38, having a relatively small grooved pulley 39 rigidly secured upon the hub 40 thereof is rotatably mounted upon the stud 26. A third grooved pulley 41, of slightly less diameter than the pulley 38, is rotatably mounted upon the stud 31 and has a flat circular disk 42 permanently secured thereto in order to provide the upper face thereof with a flat smooth surface. If desired the pulley 41 can be cast with a flat smooth upper surface in which case the disk 41 may be dispensed with. The driving motor 4 is adjustably secured to a vertically disposed plate 43, which is welded to the strut 10 and extends downwardly therefrom adjacent the leg 8, by a plurality of bolts 44 which extend through a plurality of elongated slots 45 in the plate 43. The motor 4 has a small grooved pulley 46, secured to the armature shaft thereof, which is operatively connected to the relatively large pulley 38 by a belt 47 which passes around the pulleys 38 and 46. During operation the motor 4 through the pulley 46 and belt 47 rotate the pulleys 38 and 39 in unison at a greatly reduced R. P. M.; and the pulley 39 rotates the pulley 41 and disk 42 in unison at a further reduced R. P. M. through a belt 48 which passes around the pulleys 39 and 41. The tension of the belt 47 may be adjusted by loosening the bolts 44 and then shifting the motor 4 one way or the other upon the plate 43; and the tension belt 48 may be adjusted by loosening the nut 36 and then shifting the stud 31 back or forth in the slot 35.

A substantially horizontally disposed screw threaded shaft 50 having a reduced smooth extension 51 at one end thereof is mounted in a complementary threaded aperture 52 through the upper end of a post 53 which is slidably mounted in the upper end of the sleeve 12 of the leg 6 and is biased upwardly by a helical compression spring 54 which is disposed therearound above the sleeve 12. A roller 55 which is adapted to bear against the disk 42 carried by the pulley 41 is rotatably mounted upon a bushing 56 which is clamped about the end of the shaft 50 adjacent the reduced extension 51 thereof between a pair of washers 57 by a pair of nuts 58. The shaft extension 51 is slidably seated in a vertically elongated slot 32 through the stud 26 and cooperates therewith to prevent rotation of the post 53 in the sleeve 12 during operation. The opposite end of the shaft 50 has a squared head 60 rigidly secured thereto which is pivotally secured by a pivot pin 61 between the arms 62 of a yoke 63 carried by a crank 64 which normally hangs downwardly as shown in full lines in Fig. 14. When the crank 64 is swung up into horizontal alignment with the shaft 50 the shaft 50 can be rotated thereby to move the shaft 50 back or forth in the aperture 52 in order to shift the position of contact between the roller 55 and the disk 42 toward or away from the stud 31 about which the disk 42 is rotated. A post 66 carrying a roller 67 is removably mounted in the upper end of each of the sleeves 12 of the legs 7 and 8.

The turn-table 1 consists of a large circular disk 68, of plywood or other light strong material, having a central aperture 69 in which is mounted a bushing 70. The disk 68 is rotatably seated upon the two rollers 67 carried by the legs 7 and 8 and upon the roller 55 carried by the shaft 50, with the stud 26 extending up through the bushing 70. During operation the disk 68 is rotated in a counter-clockwise direction (Fig. 1) by the pulley 41 and disk 42 about the stud 26 as an axis through the roller 55. The disk 42 rotates the roller 55 and it in turn rotates the disk 68. The speed of rotation of the disk 68 may be varied as desired by shifting the roller 55 toward or away from the stud 31 in the manner previously described.

The trays or pockets 2 are made of light sheet metal and each comprises a bottom 74, an upstanding inner wall 75 and an adjacent side wall 76. The trays are permanently secured to the disk 68 by screws 77 and are arranged in an annular row in slightly overlapping relation adjacent the periphery of the disk 68.

The energization of the motor 4 and thereby the rotation of the turn-table 1 is controlled by a snap switch 80 which is mounted upon the plate 43 under the motor 4 and has an actuating lever 81 with an eye 82 in the end thereof. In order to accommodate the switch 80 for actuation by anyone of several operators independently of each other I provide each of the legs 6, 7 and 8 with a screw eye 83 near the lower ends thereof and thread a cable 84 through the eye 82 in the actuating lever 81 and then down through the eye 83 carried by the leg 8 and thence around through the eyes 83 carried by the legs 7 and 6 and back up through the eye 83 on the leg 8 and connect the ends of the cable together. With this arrangement anyone of several operators may actuate the switch 80 by depressing the cable 84 with their foot any place around the machine. In order to prevent excessive strain upon the lever 81 when the cable 84 is depressed and to allow the depressing of the cable further than is necessary to actuate the switch 80, I interpose a coiled tension spring 85 in the cable 84 between any of the eyes 83.

In Fig. 8 I have shown another form of switch-actuating mechanism which comprises a metal rod ring 86 which is connected to a central hub 87 by a plurality of spokes 88. The ring 86 is mounted for up and down movement in clips 89 carried by the legs 6, 7 and 8, and the hub 87 is connected to the switch arm 81 through the medium of a coiled spring similar to the spring 85 which functions in the same manner as the spring 85. When this form of switch actuator is used the switch 80 is preferably carried by the spider 20.

In operation the different pages of a pamphlet are piled in separate stacks and the stacks of the successive pages are placed in successive trays or pockets 2 on the turntable 1, the stack of page one being placed in one tray, the stack of page two being placed in the next adjacent tray (clockwise Fig. 1) and so forth with the stacks of the other successive pages. Then as the turntable 1 is rotated counter-clockwise (Fig. 1) the stacks of successive pages will be successively moved past an operator standing or sitting at a station around the turntable who will pick a page from the top of each successive stack as it is moved past him. If it is found that the turn-table is not at a comfortable height for the operators it can be raised or lowered as desired by adjusting the length of the legs 6, 7 and 8 in the manner described. If the speed of rotation of the turn-table is

not correct for the most efficient use of the machine it can be speeded up or slowed down by changing the position of contact of the roller **55** with the disk **42**, and any operator can stop the rotation of the turn-table at any time by stepping on the cable **84**.

It has been found by experience that some operators when using this collating machine become nauseated from watching the constantly rotating turn-table and the trays thereon. I have therefore provided a stationary shield which is adapted to be removably mounted above the turn-table and is operative to hide the major portion of the rotating turn-table from an operator. Referring now to Figs. 9 and 10 the shield is indicated by the numeral **90**. It may be made of any suitable light material and is preferably conical as shown to prevent the placing of articles thereon. But if desired the shield may be made in the form of a flat disc and will work equally well. The diameter of the shield is such that it substantially covers all of the trays **2** as shown in Figs. 9 and 10. The shield **90** is mounted upon the upper end of a central port **90** between a collar **92** and a nut **93**. The lower end of the port **91** has a squared socket **94** therein which is adapted to encompass the complementary squared upper end of the stud **26**. With this construction the shield **90** may be quickly and easily removed from and/or placed upon the machine as desired.

From the foregoing it will be apparent to those skilled in this art that I have provided a very simple and efficient machine for accomplishing the objects of my invention. It will also be apparent to those skilled in this art that although I have shown and described my invention in connection with the collecting together of successive pages of a pamphlet or like publication, it is likewise capable of use in the collecting together of other items. For instance it could be used in assembling together the different parts of a small article of manufacture, in which case it might be desirable to use a slightly different construction of tray, but otherwise the construction and operation of the machine would be the same as shown and described.

It is to be understood that I am not limited to the specific construction shown and described as various modifications may be made therein within the scope of the appended claims.

What is claimed is:

1. A collating machine of the character described comprising a stand, a centrally disposed stationary vertical pivot stud rigidly secured to said stand and extending upwardly therefrom, a plurality of spaced rollers one of which is a driven roller arranged in an annular row around said pivot stud, a circular turn-table removably seated upon said rollers, and having an axial bore, with said pivot stud extending up through said axial bore, a plurality of trays permanently secured in an annular row on said turn-table adjacent the periphery thereof for rotation therewith, a motor mounted upon said stand and having associated therewith a switch by which the energization of said motor is controlled, and interconnecting means between said motor and said driven roller through which said driven roller is rotated by said motor, said driven roller being operative when rotated to rotate said turn-table.

2. A collating machine of the character described comprising a stand, a centrally disposed stationary vertical pivot stud rigidly secured to said stand and extending upwardly therefrom, a plurality of spaced idler rollers and a driven roller arranged in an annular row around said pivot stud, a circular turn-table removably seated upon said rollers, and having an axial bore, with said pivot stud extending up through said axial bore, a plurality of trays permanently secured in an annular row on said turn-table adjacent the periphery thereof for rotation therewith, a motor mounted upon said stand, and interengaging means between said motor and said driven roller through which said driven roller is rotated by said motor, said driven roller being operative when rotated to rotate said turn-table.

3. A collating machine of the character described comprising a stand, a centrally disposed stationary vertical pivot stud rigidly secured to said stand and extending upwardly therefrom, a pulley having a flat upper face mounted on said stand for rotation in a horizontal plane, a motor mounted upon said stand, a switch by which the energization of said motor is controlled mounted upon said stand, interengaging means between said motor and said pulley through which said pulley is rotated by said motor, a plurality of spaced rollers one of which is a driven roller mounted on said stand and arranged in an annular row around said pivot stud with the periphery of said driven roller in contact with the upper face of said pulley, a circular turn-table removably seated upon said rollers, and having an axial bore, with said pivot stud extending up through said axial bore, and a plurality of trays permanently secured in an annular row on said turn-table adjacent the periphery thereof for rotation therewith, said pulley being operative when rotated to rotate said driven roller and said driven roller being operative when rotated to rotate said turntable.

4. A collating machine as defined in claim 3 in which means is provided to shift said driven roller toward and away from the axis of said pulley and thereby change the speed of rotation of said turn-table.

5. A collating machine as defined in claim 4 in which switch-actuating means is provided by which said switch may be actuated from any position around said turntable.

6. A collating machine as defined in claim 5 in which said stand comprises a plurality of angularly disposed vertically adjustable legs connected together by a plurality of struts.

7. A collating machine as defined in claim 6 in which said switch actuating means comprises a cable connected to said switch and extending from leg to leg and through eyes carried by said legs near the lower ends thereof.

8. A collating machine of the character described comprising a stand, a centrally disposed stationary pivot stud rigidly secured to said stand and extending upwardly therefrom, a first pulley rotatably mounted upon said pivot stud, a second pulley having a flat upper face mounted upon said stand in spaced relation to said first pulley for rotation in a horizontal plane, a motor mounted upon said stand and having a switch associated therewith by which the energization of said motor is controlled, interconnecting means between said motor and said first pulley through which said first pulley is rotated at a reduced speed by said motor, interconnecting means between said first pulley and said second pulley through which said second pulley is rotated at a further reduced speed by said first pulley, a plurality of spaced rollers one of which is a driven roller mounted upon said stand and arranged in an annular row around said pivot stud with the periphery of said driven roller in contact with the upper face of said second pulley, a circular turntable removably seated upon said rollers, and having an axial bore, with said pivot stud extending up through said axial bore, and a plurality of trays permanently secured in an annular row on said turn-table adjacent the periphery thereof for rotation therewith, said second pulley being operative when rotated to rotate said driven roller and said driven roller being operative when rotated to rotate said turntable.

9. A collating machine as defined in claim 8 in which means is provided to shift said driven roller toward and away from the axis of said pulley and thereby change the speed of rotation of said turn-table.

10. A collating machine as defined in claim 9 in which

switch actuating means is provided by which said switch may be actuated from any position around said turntable.

11. A collating machine as defined in claim 10 in which said stand comprises a plurality of angularly disposed vertically adjustable legs connected together by a plurality of struts.

12. A collating machine as defined in claim 11 in which said switch actuating means comprises a cable connected to said switch and extending from leg to leg and through eyes carried by said legs near the lower ends thereof.

13. A collating machine as defined in claim 1 in which said interconnecting means includes mechanism by which the speed at which said driven roller is rotated may be adjusted between upper and lower limits.

14. A collating machine as defined in claim 13 in which switch actuating means is provided by which said switch may be actuated from any position around said turntable.

15. A collating machine as defined in claim 14 in which said stand comprises a plurality of angularly disposed vertically adjustable legs connected together by a plurality of struts.

16. A collating machine as defined in claim 15 in which said switch actuating means comprises a cable connected to said switch and extending from leg to leg and through eyes carried by said legs near the lower ends thereof.

17. A collating machine as defined in claim 1 in which a stationary shield is disposed over said machine in position to substantially cover the trays on said turn-table.

18. A collating machine as defined in claim 17 in which said shield is removably mounted upon the upper end of said pivot stud.

19. A collating machine as defined in claim 3 in which switch-actuating means is provided by which said switch may be actuated from any position around said table.

20. A collating machine as defined in claim 19 in which said stand includes a plurality of equally spaced legs and in which said switch-actuating means comprises a ring slidably supported for up and down movement by said legs, and operative connecting means between said ring and said switch.

21. A collating machine of the character described comprising a stand, a plurality of spaced rollers rotatably mounted upon said stand and arranged in an annular row, one of said rollers being a driven roller, a turntable removably seated upon said rollers, rotary guiding means carried by said stand, other rotary guiding means carried by said turntable, said rotary guiding means

and said other rotary guiding means cooperating with each other to restrain said turntable for rotation about a fixed axis, a plurality of trays carried by said turntable adjacent the periphery thereof for rotation therewith, a motor mounted upon said stand and having associated therewith a switch by which the energization of said motor is controlled, and interconnecting means between said motor and said driven roller through which said driven roller is rotated by said motor, said driven roller being operative when rotated to rotate said turntable.

22. A collating machine of the character described comprising a stand, a plurality of spaced rollers rotatably mounted upon said stand and arranged in an annular row, one of said rollers being a driven roller, a turntable removably seated upon said rollers, rotary guiding means carried by said stand, other rotary guiding means carried by said turntable, said rotary guiding means and said other rotary guiding means cooperating with each other to restrain said turntable for rotation about a fixed axis, a plurality of trays carried by said turntable adjacent the periphery thereof for rotation therewith, a motor mounted upon said stand, a driven member mounted upon said stand for rotation about a vertical axis, interconnecting means between said motor and said driven member through which said driven member is rotated by said motor, said driven member being operative when rotated to rotate said driven roller and said driven roller being operative when rotated to rotate said turntable.

23. A collating machine as defined in claim 21 in which said interconnecting means between said motor and said driven roller includes mechanism by which the speed of rotation of said driven roller may be varied as desired between upper and lower limits.

24. A collating machine as defined in claim 21 in which said interconnecting means between said motor and said driven roller comprises a driven member rotatably mounted upon said stand for rotation about a vertical axis and mechanism by which the speed of rotation of said driven roller may be varied as desired between upper and lower limits.

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