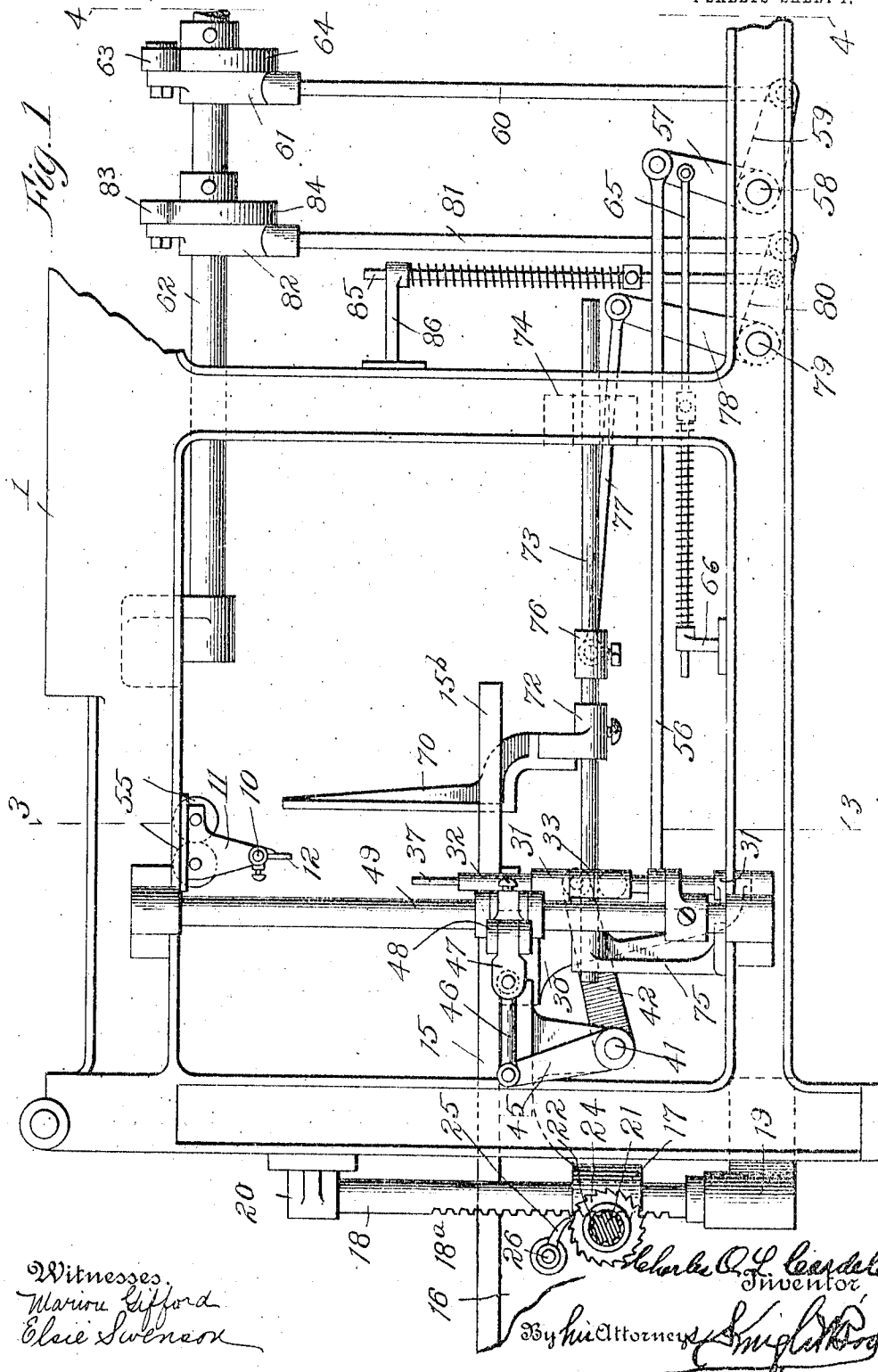


1,053,706.

4 SHEETS--SHEET 1.

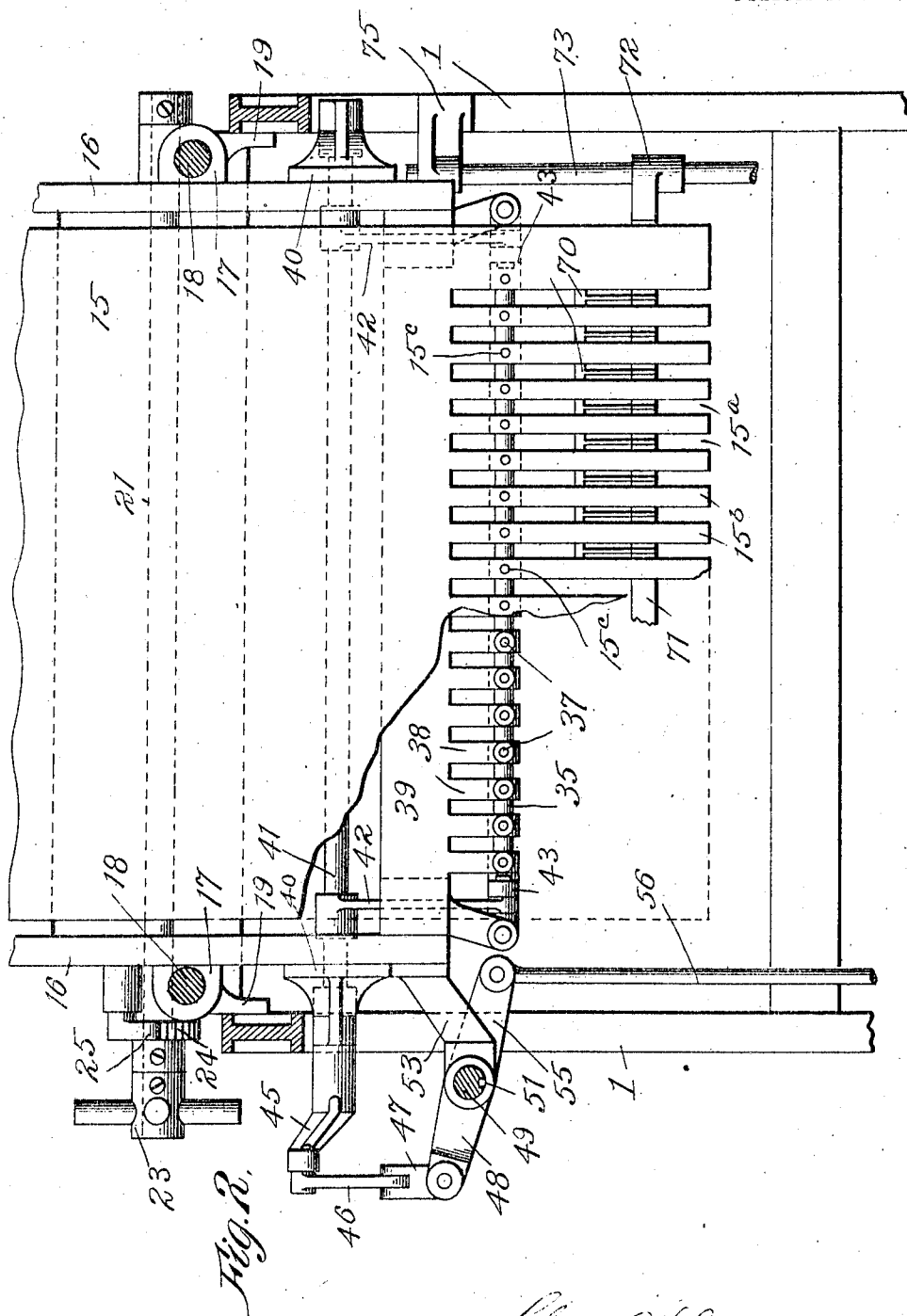


C. O. L. CARDELL.
 PACKING BOX FOR FOLDING MACHINES.
 APPLICATION FILED JUNE 1, 1911.

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Patented Feb. 18, 1913.

4 SHEETS—SHEET 2.



Witnesses:
 Marion Clifford
 Elsie Swenson

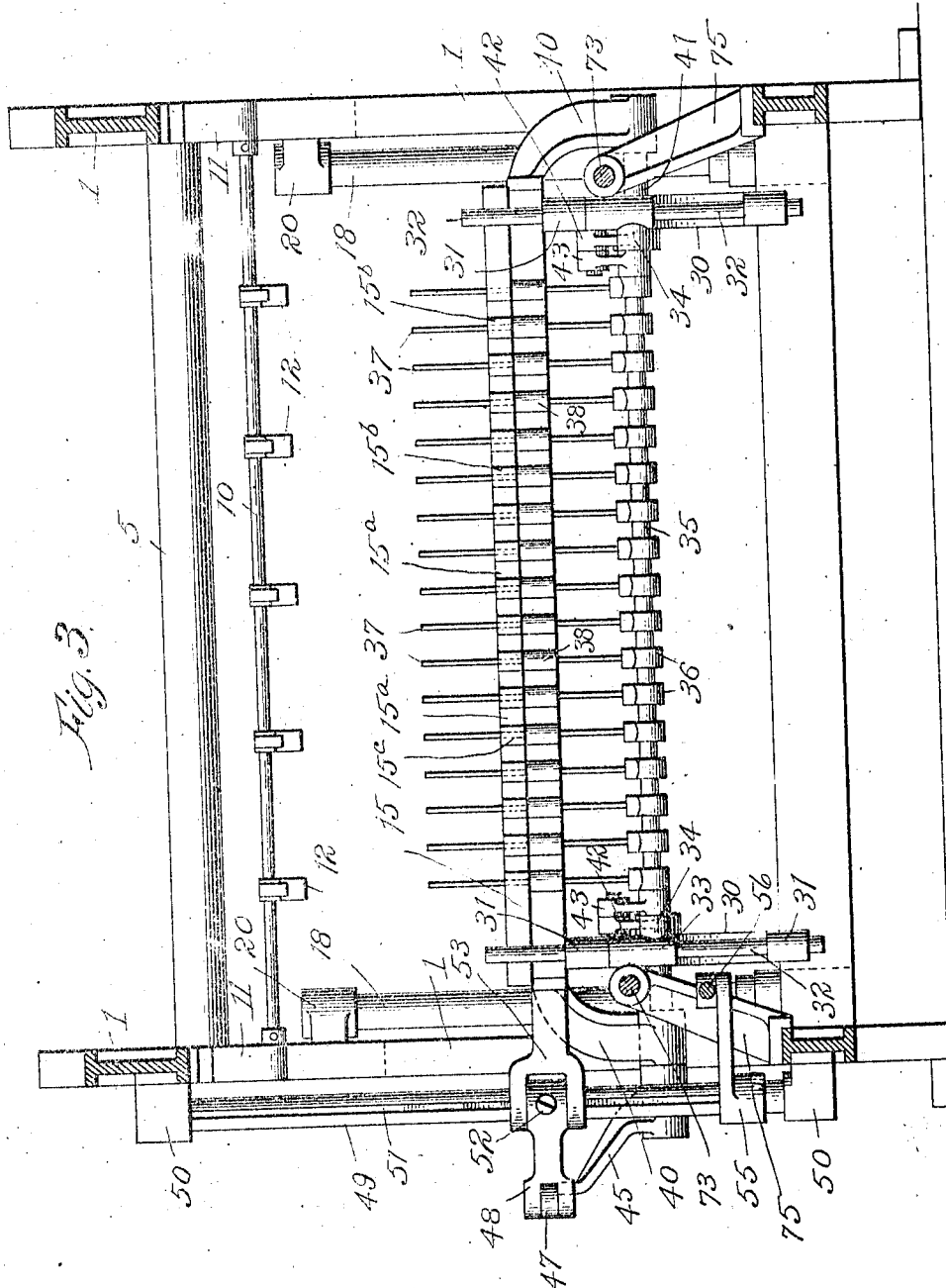
Charles C. L. Cardell, Inventor
 By *Attorneys* *Freight*

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Witnesses:
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Charles O. L. Cardell, Inventor,

By his Attorney, J. H. [Signature]

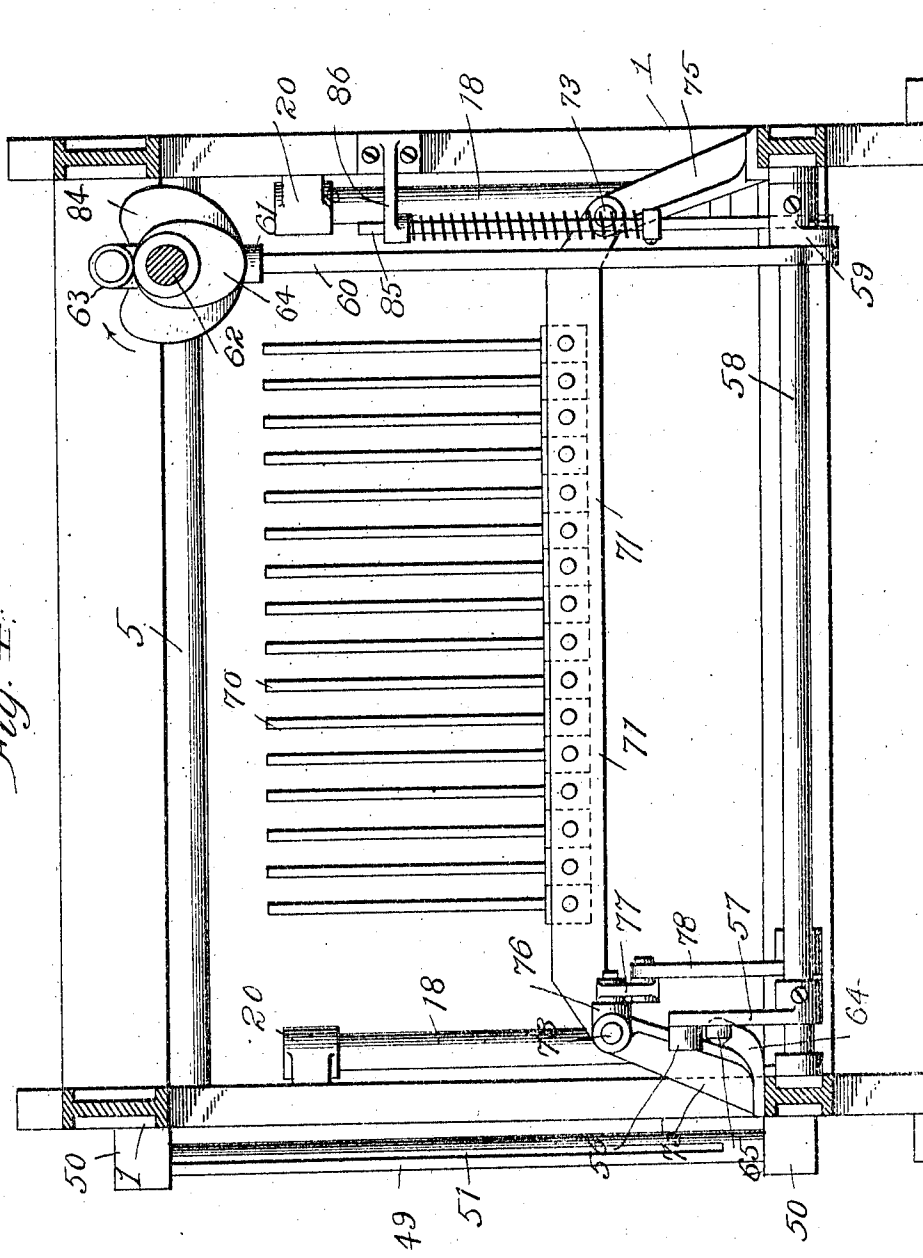
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4 SHEETS-SHEET 4.

Fig. 4.



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By his Attorneys
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UNITED STATES PATENT OFFICE.

CHARLES O. L. CARDELL, OF PEARL RIVER, NEW YORK, ASSIGNOR TO DEXTER FOLDER COMPANY, OF PEARL RIVER, NEW YORK. A CORPORATION OF NEW YORK.

PACKING-BOX FOR FOLDING-MACHINES.

1,053,706.

Specification of Letters Patent.

Patented Feb. 18, 1913.

Application filed June 1, 1911. Serial No. 830,609.

To all whom it may concern:

Be it known that I, CHARLES O. L. CARDELL, a citizen of the United States, and a resident of Pearl River, Rockland county, State of New York, have invented certain new and useful Improvements in Packing-Boxes for Folding-Machines, of which the following is a specification.

The present invention relates to the type of mechanism for packing the folded sheets or signatures delivered from a folding machine, in which the folded sheets or signatures are received in upright position upon a table or platform and moved forwardly intermittently by a packing device and retained in position by an intermittently operating barrier which alternates with the packing device. In packing mechanisms of this type, the receiving table or platform is adjustable toward and away from the delivery mechanism of the folding machine to adapt it to folded sheets or signatures of various sizes, the packing device and barrier being of proper dimensions to cooperate with the receiving table or platform when adjusted to receive the largest size of folded sheets or signatures for which the mechanism is adapted. With such packing mechanisms, the stack retaining barrier must have a sufficient length of stroke into and out of operative position to clear the receiving table or platform when it is in position to receive the largest folded sheets or signatures. This requirement as to the stroke of the barrier produces an unnecessarily long stroke when the receiving table or platform is receiving a smaller folded sheet or signature.

The object of the present invention is to improve the construction of such packing mechanisms for folding machines by which the stroke of the stack retaining barrier may be reduced to a minimum without interfering with the adjustability of the packing box to suit varying sizes of folded sheets or signatures. In accomplishing this object, I have produced a packing box in which the stack retaining barrier is mounted upon the receiving table or platform and is vertically adjustable therewith, and the distance which the barrier fingers project above the surface of the table or platform, being independent of the various adjustments. The operating mechanism for the stack retaining barrier includes certain adjustable parts in connec-

tion with the barrier to move with the table or platform when it is adjusted to suit the size of folded sheets or signatures produced.

In order that my invention may be fully understood, I will first describe the same with reference to the accompanying drawings, and afterward point out the novelty more particularly in the annexed claims.

In said drawings: Figure 1 is a side elevation of my improved packing mechanism for folding machines. Fig. 2 is a sectional plan view of the same, certain parts being removed in the interest of clearness. Fig. 3 is a vertical transverse sectional view taken on the line 3--3 of Fig. 1, and Fig. 4 is a transverse sectional elevation taken on the line 4--4 of Fig. 1, showing the reciprocating packing devices and omitting the table and adjustable reciprocating barrier.

In illustrating my invention, I have shown only a part of the delivery end of any suitable folding machine to which my improvements may be applied.

1 represents the framework of the folding machine at its delivery end.

5, 5 indicate the final compression and delivery rollers through which the completely folded sheets or signatures pass and by which they are dropped into the packing box. These delivery rollers 5 are suitably journaled in the frame 1 of the folding machine. Below the rollers 5 is a transverse shaft 10 secured at its ends in suitable brackets indicated at 11 and supporting between its ends a plurality of depending gravity dogs 12 which are free to move in one direction under the action of the packer fingers and are held against movement in the opposite direction by suitable shouldered collars to support the stack of folded sheets or signatures at the top to maintain them out of the path of succeeding sheets or signatures which are dropped from the delivery rollers 5. This part of the mechanism is very common in the art.

15 is the table or platform of the packing box upon which the successive folded sheets or signatures are dropped on edge. This table or platform 15 is mounted upon suitable side brackets indicated at 16 which are formed with outwardly presented ears 17 having vertical guide openings through which extend the vertical bars 18 mounted at their ends in brackets 19 and 20 secured

to the folder frame. One face of each of the vertical bars 18 has rack teeth 18^a cut into it. A transverse shaft 21 is freely journaled in bearings formed upon the ears or lugs 17 and has small gears or pinions 22 cut upon it in proper position to mesh with the rack teeth 18^a just referred to. The shaft 21 is provided at one end with a suitable hand wheel 23 by which it can be rotated. Adjacent to the hand wheel 23, shaft 21 is provided with a ratchet wheel 24 with which engages the gravity pawl or dog 25 journaled at 26 upon one of the table supporting brackets 16. By rotating the shaft 21 forwardly the table 15 can be raised upon the supporting bars 18 to bring it closer to the delivery rollers 5 preparatory to receiving smaller folded sheets or signatures. By disengaging the dog 25 from the ratchet 24, the shaft 21 can be rotated rearwardly to lower the table 15 to suit larger folded sheets or signatures.

The end of the supporting table or platform 15 directly beneath the delivery rollers 5 is formed with a series of parallel slots 15^a in which the horizontally reciprocating packer fingers operate in the manner presently to be explained. The slotting of the end of the table 15 provides a series of supporting fingers 15^b, each one of which is formed with a vertical opening 15^c for the passage of one of the rods of the vertically reciprocating barrier which will now be described.

Secured to and depending from the table supporting brackets 16 are the brackets 30 formed with bearing ears 31 in which reciprocate the vertical guide rods 32 having secured to them between the bearings 31 the sleeves 33 formed with inwardly presented bosses 34 between which is supported a transverse bar 35. This bar 35 carries a plurality of collars 36 from each one of which projects a barrier rod 37. These rods 37 extend upwardly from bar 35 passing through openings in guide arms 38 projecting from a metal plate 39 extending transversely beneath the table or platform 15 and secured at its ends to the supporting brackets 16 of the table. The barrier rods 37 also project through the openings 15^c of the table arms 15^b above referred to.

40, 40 are curved bracket arms secured to the table brackets 16 and supporting in their depending ends a transversely extending rock shaft 41 which carries adjacent to its ends inside of the brackets 40 the rock arms 42 supporting at their ends the hanger links 43 which are journaled upon the bar 35 above referred to.

The rock shaft 41 has keyed to one end a rock arm 45 connected by link 46 which has swivel connection 47 with a rock arm 48 adjustably mounted upon a vertical rock shaft 49 journaled in bracket bearings 50

secured to the folding machine frame. This vertical rock shaft 49 has a spline groove 51 extending from end to end, and the adjustable rock arm 48 carries a key screw 52 which engages the spline groove 51 for keying the rock shaft 48 upon shaft 49. A bifurcated bracket arm 53 extends from one of the table brackets 16 and embraces the vertical rock shaft 49 with an ear resting upon each side of the hub of rock arm 48 so that upon loosening the key screw 52 and adjusting the table vertically, said rock arm 48 will be adjusted upon the shaft 49 to suit the adjustment of the table, the other operating parts of the reciprocating barrier just described moving with the table because supported therefrom.

At the lower end of the vertical rock shaft 49 is keyed a rock arm 55 having a rod 56 connecting it with a rock arm 57 secured to a transverse rock shaft 58 carrying at its opposite end a rock arm 59 from which extends a vertical pitman 60 carrying a guide yoke 61 guided upon a shaft 62 and supporting an anti-friction roller 63 in operative relation to a cam 64 fixed upon said shaft 62. The shaft 62 is journaled in suitable bearings upon the frame of the folding machine and is operated in any suitable manner by means not shown. A spring actuated rod 65 engages the rock arm 57 and extends through a guide bracket 66 for moving the described mechanism in opposition to the cam 64.

The packer fingers indicated at 70 project up through the slots 15^a formed in the table 15 and are mounted at their lower ends upon a cross bar 71 formed with guide sockets 72 adjustably secured upon the horizontally reciprocating bars 73 which are freely journaled in the brackets 74 and 75. One of the bars 73 carries an adjustably secured sleeve 76 to which is pivoted a rod 77 extending therefrom to a rock arm 78 fixed to a transverse rock shaft 79 carrying at its opposite end a rock arm 80 connected with a vertical pitman 81 having a guide yoke 82 guided upon the shaft 62 above referred to. This guide yoke 82 carries an anti-friction roller 83 which operates in peripheral contact with a controlling cam 84 keyed to the shaft 62. A spring actuated rod 85 is connected with the rock arm 80 and extends therefrom through a guide bracket 86 for cooperating with the cam 84 in producing the reciprocating movements of the packing fingers.

In the operation of the improved packing mechanism, the successive folded sheets or signatures drop from the rollers 5 to the platform 15 which has previously been adjusted to the proper height to receive the size of sheets or signatures being operated upon. As each folded sheet or signature reaches the table 15, the barrier fingers 37 are drawn downwardly beneath the surface

of the table and the packer fingers 70 are moved inwardly in the table slots, to carry the last delivered folded sheet or signature horizontally along the table against the stack or row of previously forwarded signatures. Immediately after the movement of the delivered signature past the line of the barrier fingers 37, the fingers 37 again project above the surface of the table and as the packer fingers are drawn back, the fingers 37 engage the last forwarded folded sheet or signature adjacent to the table and retain the stack in place. The gravity retaining fingers 12 yield to permit the action of the packer fingers and upon the return of the packer fingers away from the stack, said fingers 12 engage the upper edge of the last sheet or signature and retain the stack in position at the top.

The important feature of novelty in my present invention is the construction and arrangement of the parts of the packing mechanism by which the table and barrier fingers can readily be adjusted to suit any size of folded sheet or signature to be delivered by the folding machine. It is desirable to confine the movement of the barrier fingers to as small a compass as practical, and to have them project uniformly above the surface of the table when they are in retaining position, and for this reason, it is important that they be adjusted with the adjustment of the table. This structure is of great advantage over structures heretofore employed in which the table alone has been adjusted and the barrier fingers made of extreme length so as to project an extreme distance above the surface of the table when operating upon large sheets, since in this old form of construction, it is necessary to give the barrier fingers a long stroke into and out of operation to suit their operation to the handling of the largest folded sheets or signatures. In my construction, the vertical stroke of the barrier fingers is the minimum stroke required to move them into and out of operative position and the stroke is the same whether operating upon large or small folded sheets or signatures.

What I claim is:

1. In a device of the character described, the combination with a vertically adjustable table of a packing device, a vertical rock shaft, a barrier cooperating with said packing device, and means operatably connecting said rock shaft to said barrier, said means being adjustable along said rock shaft.

2. In a device of the character described, the combination with a vertically adjustable table, of vertically disposed guide rods, a barrier supporting member reciprocally mounted on said guide rods, a packing device, a rock shaft journaled in brackets depending from said table, and means oper-

atably connecting said barrier supporting member to said rock shaft.

3. In a mechanism of the character described, the combination with a paper folding machine, of a receiving table adjustable vertically toward and away from the delivery mechanism of said folding machine, a reciprocating packing device, a reciprocating barrier mounted beneath said table and projecting above the top surface of the table, a vertical rock shaft journaled adjacent to said table, means for operating said rock shaft, barrier-operating devices engaging with and operated by said vertical rock shaft, and means for adjusting said operating devices upon said rock shaft simultaneously with the adjustment of the table.

4. In a mechanism of the character described, the combination with a paper folding machine, of a receiving table adjustable vertically toward and away from the delivery mechanism of said folding machine, a reciprocating packing device, a vertically reciprocating barrier mounted upon and beneath said table and projecting above the top surface of the table, a vertical rock shaft journaled adjacent to said table, means for operating said rock shaft, and barrier-operating devices including a rock arm keyed to and adjustable on said vertical rock shaft, and a bracket arm projecting from said table and engaging said rock arm to adjust it upon said vertical rock shaft.

5. In a packing mechanism for folding machines, the combination of the upright table supporting bars, table brackets adjustably mounted upon said bars, means for adjusting said brackets upon said bars, a table or platform mounted upon said brackets, parallel vertical guide rods supported upon said table brackets, a vertically reciprocating barrier mounted upon said guide rods and provided with a series of sheet retaining fingers which project through the table or platform, a transverse rock shaft journaled in bearings upon said table brackets, rock arms projecting from said rock shaft and connected with said barrier, a vertical rock shaft, a rock arm adjustably secured upon said vertical rock shaft and suitably connected with said transverse rock shaft, operating mechanism for rocking said vertical rock shaft, and a suitable horizontally reciprocating packing device mounted in operative relation to said table and said sheet retaining fingers.

6. In a packing mechanism for folding machines, the combination of the upright table supporting bars, table brackets adjustably mounted upon said bars, means for adjusting said brackets upon said bars, a table or platform mounted upon said brackets, parallel vertical guide rods supported upon said table brackets, a vertically recip-

5 reciprocating transverse bar mounted upon said
 guide rods, a series of sheet confining fin-
 gers mounted upon said transverse bar and
 projecting through the table or platform, a
 10 transverse rock shaft journaled in bearings
 supported upon said table brackets, rock
 arms projecting from said rock shaft, and
 connected with said transverse bar, a verti-
 cal rock shaft formed with a longitudinal
 15 key groove, a rock arm adjustably keyed
 upon said vertical rock shaft and suitably
 connected with said horizontal rock shaft,
 an arm projecting from one of said table
 20 brackets into engagement with said adjust-
 able rock-arm, operating mechanism for
 rocking said vertical rock shaft, and a suit-
 able horizontally reciprocating packing de-

vice mounted in operative relation to said table and said sheet retaining fingers.

7. In a device of the character described, 20
 the combination with a vertically adjustable
 table, of vertically disposed guide rods, a bar-
 rier supporting member reciprocably mount-
 ed on said guide rods, a packing device, a rock
 shaft journaled in brackets depending from 25
 said table, and means operatably connecting
 said barrier supporting member to said rock
 shaft, said guide rods being mounted to
 partake of the vertical movements of said
 table.

CHARLES O. L. CARDELL.

Witnesses:

EUGENE KETCHUM,
 CORDES LUCAS.