

J. P. RENZ.
 COUNTER AND STACKER FOR SHEET MATERIAL.
 APPLICATION FILED MAY 7, 1919.

1,366,938.

Patented Feb. 1, 1921.

4 SHEETS—SHEET 1.

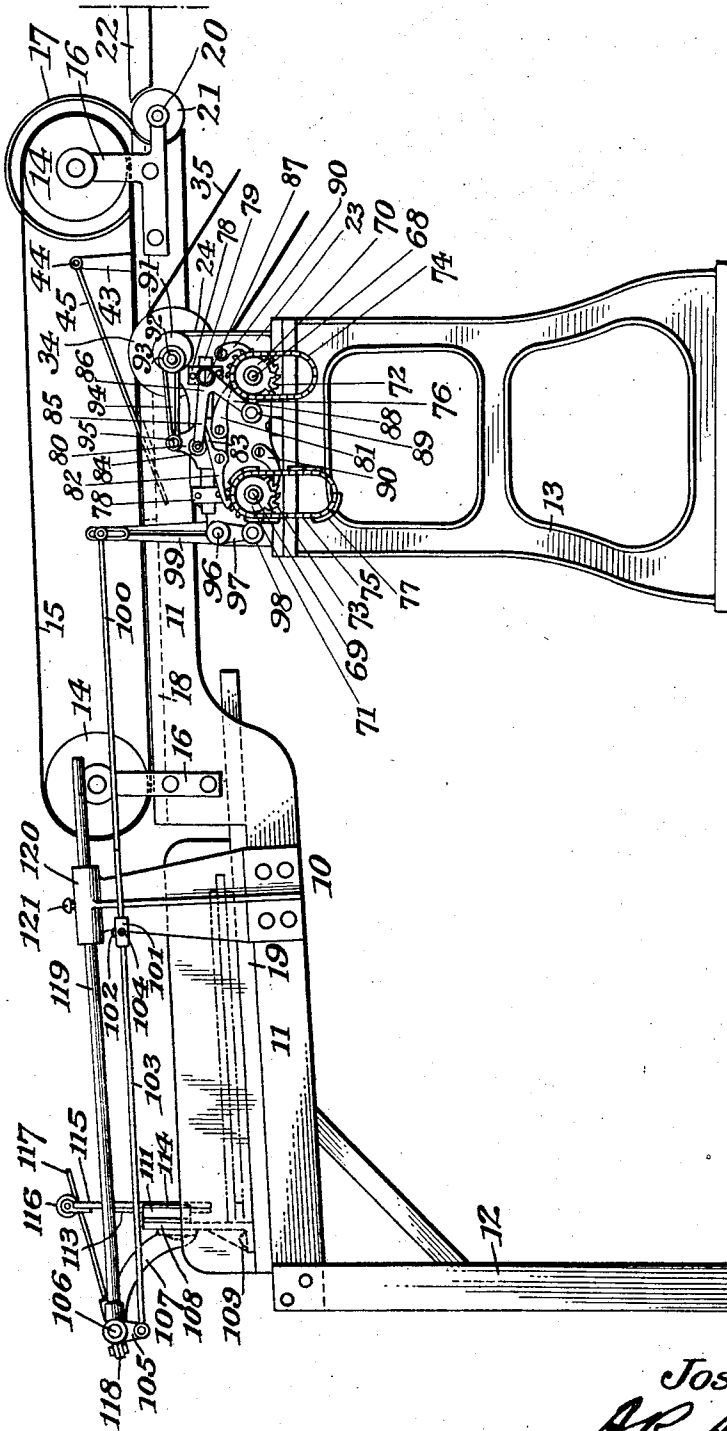


Fig. 1.

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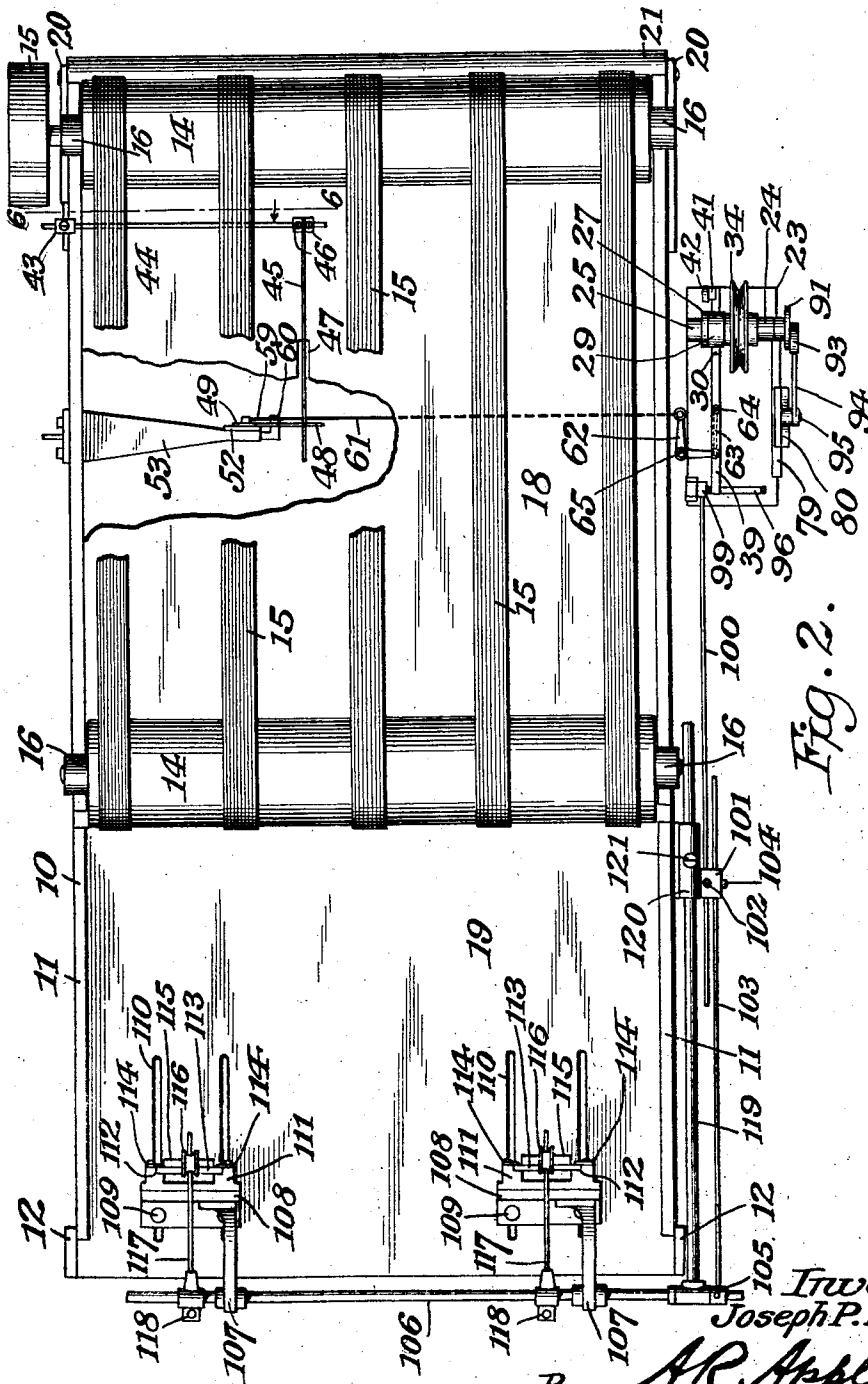


Fig. 2.

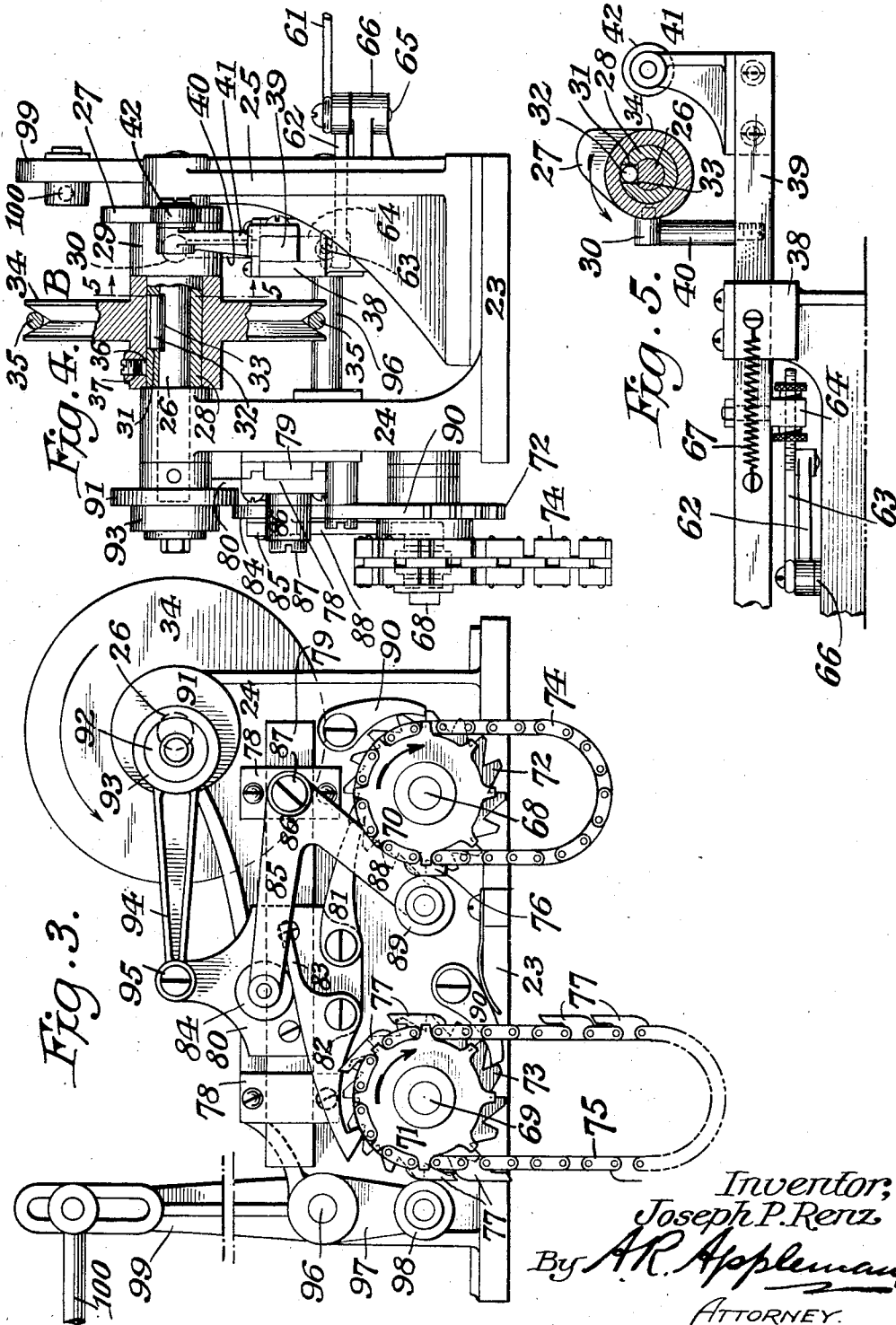
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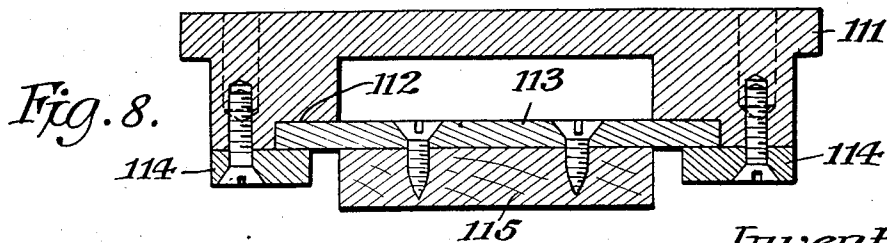
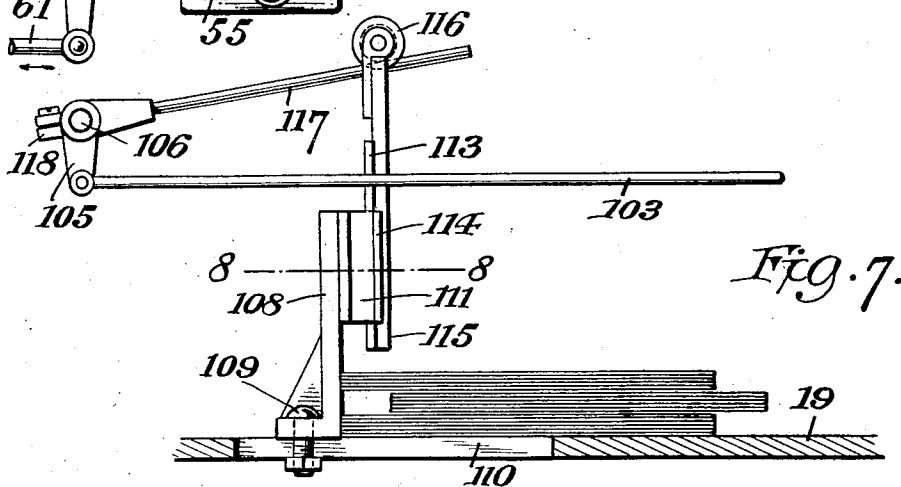
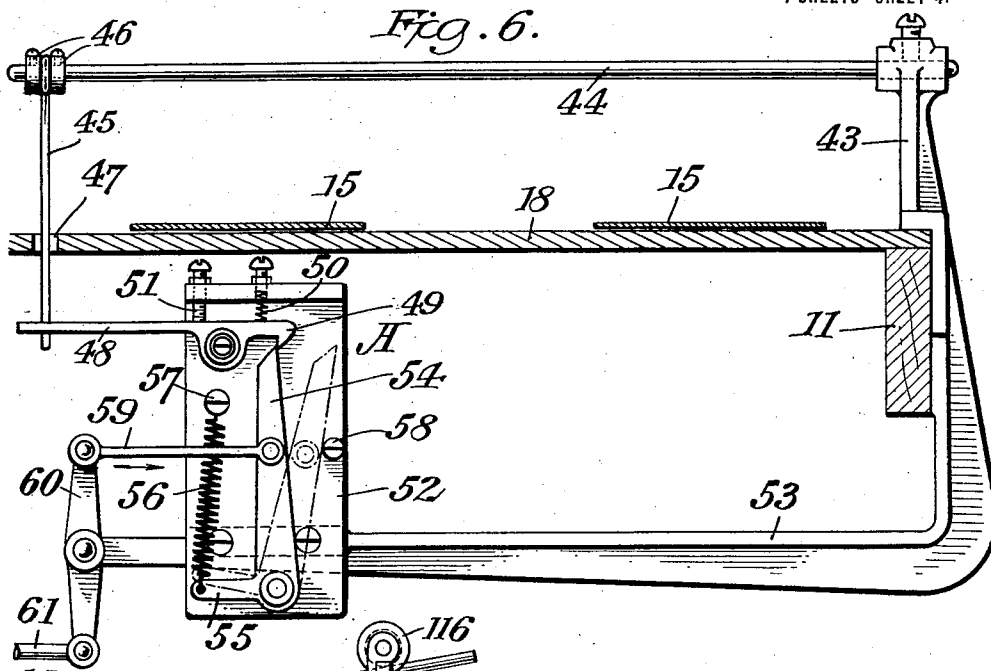
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 4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

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COUNTER AND STACKER FOR SHEET MATERIAL.

1,366,938.

Specification of Letters Patent.

Patented Feb. 1, 1921.

Application filed May 7, 1919. Serial No. 295,346.

To all whom it may concern:

Be it known that I, JOSEPH P. RENZ, a citizen of the United States, residing at Brooklyn, county of Queens, State of New York, have invented a new and useful Improvement in Counters and Stackers for Sheet Material, of which the following is a specification.

This invention relates to machines for counting and stacking sheet material, a principal object being to provide automatic means for counting sheet material and arranging the same in equal stacks or piles, said stacks or piles being disposed, as units, one upon another, in staggered or broken relation so that the counted stacks when removed from the table may easily be separated and wrapped, packed, or otherwise disposed of.

To these ends, and to such others as the invention may pertain, the same consists, further, in a novel construction, combination and adaptation of the parts, as will be hereinafter more fully described and claimed.

In the drawings similar reference characters are employed to designate corresponding parts through the several views, in which:—

Figure 1 is a side elevation of my improved machine, indicating, by dotted lines, three counted stacks of paper lying on the receiving table.

Fig. 2 is a plan view of the machine, parts being broken away and parts omitted.

Fig. 3 is an enlarged side elevation showing the major part of the counting mechanism.

Fig. 4 is an end view thereof, parts being in section.

Fig. 5 is a partial sectional elevation, the line of section being taken at or about the line 5—5 of Fig. 4.

Fig. 6 is a partial section taken about on the line 6—6 of Fig. 2 and on an enlarged scale.

Fig. 7 is a fragmentary sectional elevation showing more clearly the method of arranging the accurately counted stacks, as units, one upon another and also showing a gage gate and its associated parts.

Fig. 8 is an enlarged horizontal section taken on the line 8—8 of Fig. 7.

In describing my improved machine, I employ a supporting frame 10, constituted

by side bars 11, supported at the front by legs 12, and near the rear by a suitable frame 13, which also carries the counting mechanism to be later described.

Rollers 14, carrying feed belts 15, are mounted in suitable bearings 16, as shown, and are driven through a pulley 17, belted to a suitable source of power.

The side bars 11 carry a feed table 18, on which the sheet material is fed into the machine by the belts 15, and a receiving table 19, arranged in front of and below the feed table as clearly shown in Fig. 1 of the drawings. The rear bearings 16, also have extensions 20, to support a small roller 21, which aids in the feeding operation; a portion of a cutting or other table being shown at 22.

My improved counting mechanism is shown best in Figs. 3, and 4, of the drawings and comprises a frame 23, supported on the frame 13, and carries in suitable bearings 24 and 25, a transverse shaft 26, having a cam 27, keyed thereto and carrying a sleeve 28, having a head 29, provided with a projecting pin 30, said sleeve being also provided with a longitudinal slot 31, receiving a roller 32, lying in a flat portion 33, formed in the shaft 26, and freely mounted on the sleeve 28, is a constantly driven grooved power wheel 34, over which a driving belt 35 passes, said power wheel being provided with an extension at one side as shown, in which is placed a friction shoe 36, spring pressed as at 37.

Mounted in suitable bearings 38, below the head 29, is a slidable horizontal bar 39, carrying a vertically ranging stop pin 40, which normally underlies the pin 30, to hold the sleeve 28, and its associated parts against rotation, between the counting operations of the machine.

The bar 39, is further provided with a bracket 41, in which a roller 42, is mounted in alinement with the cam 27, and which contacts therewith at each rotation of the shaft 26, to return the bar 39, to its normal position, after each counting operation of the machine.

A bracket 43, is secured to one of the side bars 11, and carries an inwardly directed rod 44, on which a gravity finger 45, is loosely confined between two collars 46, shown best in Fig. 6, of the drawings, and this gravity finger projects through an opening 47, in the feed table 18, and rests

on an arm 48, of a pivoted trip dog 49, spring pressed as at 50, against a stop 51, said spring and stop being arranged at opposite sides of its pivot as clearly shown in Fig. 6.

The trip dog 49, is carried on a supporting plate 52, fixed on a bracket 53, secured to the machine frame, and said plate 52, also carries in pivotal relation, a trip lever 54, provided with a tail-piece 55, to which one end of a pull spring 56, is attached, the opposite end of said spring being secured to a fixed pin 57, on the supporting plate. The engaging noses of the trip dog 49, and trip lever 54, are normally interlocked, but when a sheet of paper or other material passes into the machine over the feed table 18, it raises the gravity finger 45, which, as the sheet passes, drops onto the arm 48, of the trip dog 49, releasing the trip lever 54, permitting the spring 56, to throw said lever to the right against a stop pin 58, as indicated in dotted lines in Fig. 6, and this movement of the trip lever withdraws the pin 40, from the pin 30, through a link 59, connected by a rocker arm 60, to a rod 61, attached at the opposite side of the machine to one arm of a bell crank lever 62, the other arm being connected by an adjustable link 63, to a stud 64, carried on the slidable bar 39, said bell crank lever being pivoted as at 65, on a bracket 66, projecting from the frame 23, of the counting mechanism.

A spring 67, is attached, one end to the bar 39, and the other end to the bearing 38, and assists in the sliding movement of the bar 39, to the right during the counting operation.

From one side of the frame 23, of the counting mechanism projects two stub shafts 68, and 69, on which are rotatably carried double sprockets 70, and 71, made fast with ratchet wheels 72, and 73, respectively.

Chains 74, and 75, are carried on the sprockets and are provided with cams 76, and 77, but one of the former being shown and several of the latter, the arrangement of the cams as shown being that which is necessary to count sheet material and arrange it in staggered or broken stacks, each of one hundred sheets.

Slidably mounted above the sprockets, in suitable bearings 78, is a horizontal bar 79, to which is bolted a plate 80, on which is carried a push dog 81, engaging ratchet 72, and a pull dog 82, engaging ratchet 73, the latter dog has a tail piece 83, on which rests a gravity roller 84, carried on an arm 85, of a bell crank 86, pivoted at 87, to one of the bearings 78, the other arm 88, of the bell crank has a roller 89, held in the path of the cam 76, so that at every complete travel of the chain 74, over its sprocket, the said cam will contact with and raise the roller to the position shown in Fig. 3, thus rocking

the bell crank on its pivot, and raising the roller 84, permitting the pull dog 82, to drop into the teeth of the ratchet 73, as shown in the said figure.

To prevent backward movement of the sprockets I provide retaining dogs 90, and pinned to the shaft 26, is a disk 91, having an eccentric boss 92, which receives a sleeve or strap 93, on a pitman 94, which is pivoted at its other end to the plate 80, as shown at 95.

From the foregoing description it will be seen that as the sheets of material are fed into the machine, one at a time, the gravity finger is raised, and drops as each sheet passes, the dropping of said finger releases the tripper mechanism A, previously described, and the clutch mechanism B, also previously described, permitting a full rotation of the shaft 26, and through pitman 94, operates bar 79, to rotate the ratchets and sprockets of the counting mechanism one step at each passage of a sheet.

The mechanism for arranging the counted stacks in staggered or broken relation on the receiving table may be described as follows:—

A rock shaft 96, is arranged in suitable bearings across the frame 23, the front end carries a downwardly directed arm 97, carrying a roller 98, adapted to contact with the cams 77, as they pass. The rear end of the shaft 96, has an upwardly directed arm 99, to which is pivotally attached a link rod 100, which extends forward through an adjusting block 101, in which it is held by a screw 102. Another link rod 103 is also secured in said block by a screw 104, with its opposite end connected pivotally to a short arm 105, fixed to a transverse shaft 106, supported in bearings 107, which are attached to bracket plates 108, adjustably secured to the receiving table 19, by bolts 109, passing downwardly through longitudinally arranged slots 110, as shown in Fig. 2.

Guide blocks 111, are bolted or otherwise secured to the bracket plates 108, said blocks being grooved as shown at 112, to receive plates 113, slidably confined behind gib plates 114, and carrying gage gates 115, having rollers 116, at the top, which rest on arms 117, clamped to the shaft 106, as at 118.

The shaft 106 is further supported at one end by a bar 119, adjustably carried on a bracket 120, and held by a set screw 121.

In describing the counting and stacking operations, it will be understood that any predetermined number of sheets may be counted and stacked, all depending upon the arrangement of the cams on the chains, and chains having different combinations are, of course, constantly at hand, so that the "count" of the machine may be changed in a minute by simply changing the chains.

Referring to Fig. 3, the chain 74, has one

cam, the chain 75, has an alternate arrangement of four low links and four high links, that is, the cams extend over each alternate four links, the ratchets are so arranged that
 5 each tooth registers with a link of a chain, so that each step movement of a ratchet causes its corresponding chain to move one link to the right. The step movements of the chain 74, are controlled by the sheet material passing into the machine as before
 10 stated, but the step movements of the chain 75, are controlled by the cam or cams on the chain 74.

The chains 74, and 75, as shown in Fig. 3, will accurately count and form staggered
 15 stacks each of 100 sheets, there being twenty-five links in, and one cam on chain 74, thus twenty-five step movements are required to bring the cam 76, again around under the
 20 roller 89, to raise the same and permit the dog 82, to engage the ratchet 73, to give it a step movement and when this is repeated four times, one hundred sheets have passed into the machine and onto the receiving table
 25 19, and at the next step movement the roller 98, rides off the cams 77, and the gage gates 115, drop by gravity onto the counted stacks and act as stop gages for the next stack to be counted, and after this stack is
 30 counted the gage gates are again raised by the roller 98, again riding up on the cams 77, as will be readily understood.

I may dispense with the chain 75, and its associated parts and use only the chain 74,
 35 with some indicating device or signal to notify the operator when a counted pile or stack is complete.

It is thought that the operation and utility of the machine will be apparent without further description, and it is to be understood
 40 that the structural elements shown are susceptible to such variations and modifications as fall within the scope of the appended claims.

45 Having thus fully described the invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a counting and stacking machine of the class described, means for feeding the
 50 sheets into the machine one at a time, counting mechanism, means operable by the sheets as they pass for controlling the counting mechanism, gage gates, and means controlled by the counting mechanism for operating said gates after each alternate stack
 55 is counted and complete, to arrange said stacks in staggered or broken relation one upon another as described.

2. A counting and stacking machine for
 60 sheet material comprising a constantly moving feed belt adapted to feed said sheets one at a time into the machine, counting mechanism operated at each passage of a sheet to

give step movement thereto, gage gates, and means operated by said counting mechanism
 65 for operating said gates to arrange said material in accurately counted staggered stacks one upon another as described.

3. In a counting and stacking machine for sheet material, means for feeding the ma-
 70 terial into the machine sheet by sheet, counting mechanism, a tripping device adapted to contact with each successive sheet to give successive step movements to the counting
 75 mechanism and means controlled by the counting mechanism, for arranging the counted material into equal staggered stacks one upon another as described.

4. In a counting and stacking machine for sheet material, feeding mechanism for de-
 80 livering the sheets one at a time into the machine, counting mechanism, gravity means operated by the passing sheets for controlling the counting mechanism to give it a step
 85 movement as each sheet passes, means controlled by said counting mechanism for arranging the counted stacks in staggered or broken relation, said last named means comprising vertically movable gage gates as
 90 shown and described.

5. In a counting and stacking machine for sheet material, a supporting frame, feed
 belts mounted thereon, counting mechanism, a gravity trip finger, means for controlling
 95 the counting mechanism, said means being operated by the falling of said finger as each sheet passes to impart a step movement to said mechanism, and means operated at the beginning of the formation of each alternate
 100 stack, for arranging the stacks one above the other in staggered or broken relation.

6. In a counting and stacking machine for sheet material, a frame, feed belts mounted
 therein, a gravity finger adapted to be raised by the passing sheets, counting mechanism,
 105 tripper devices controlled by the finger and controlling the counting mechanism, and gage gates having connection with said counting mechanism and controlled thereby, said gates being adjustable as shown.
 110

7. In a machine of the class described, a frame, feed belts mounted thereon, a gravity
 finger, a tripper mechanism controlled thereby, clutch mechanism controlled by the tripper
 115 mechanism, counting mechanism controlled by said clutch mechanism, endless chains operated by the counting mechanism and forming a part thereof, cams on said chains, and means for imparting step movements to said chains for the purpose speci-
 120 fied.

In testimony whereof I, JOSEPH P. RENZ, have signed my name to this specification this 15th day of April, 1919.

JOSEPH P. RENZ.