

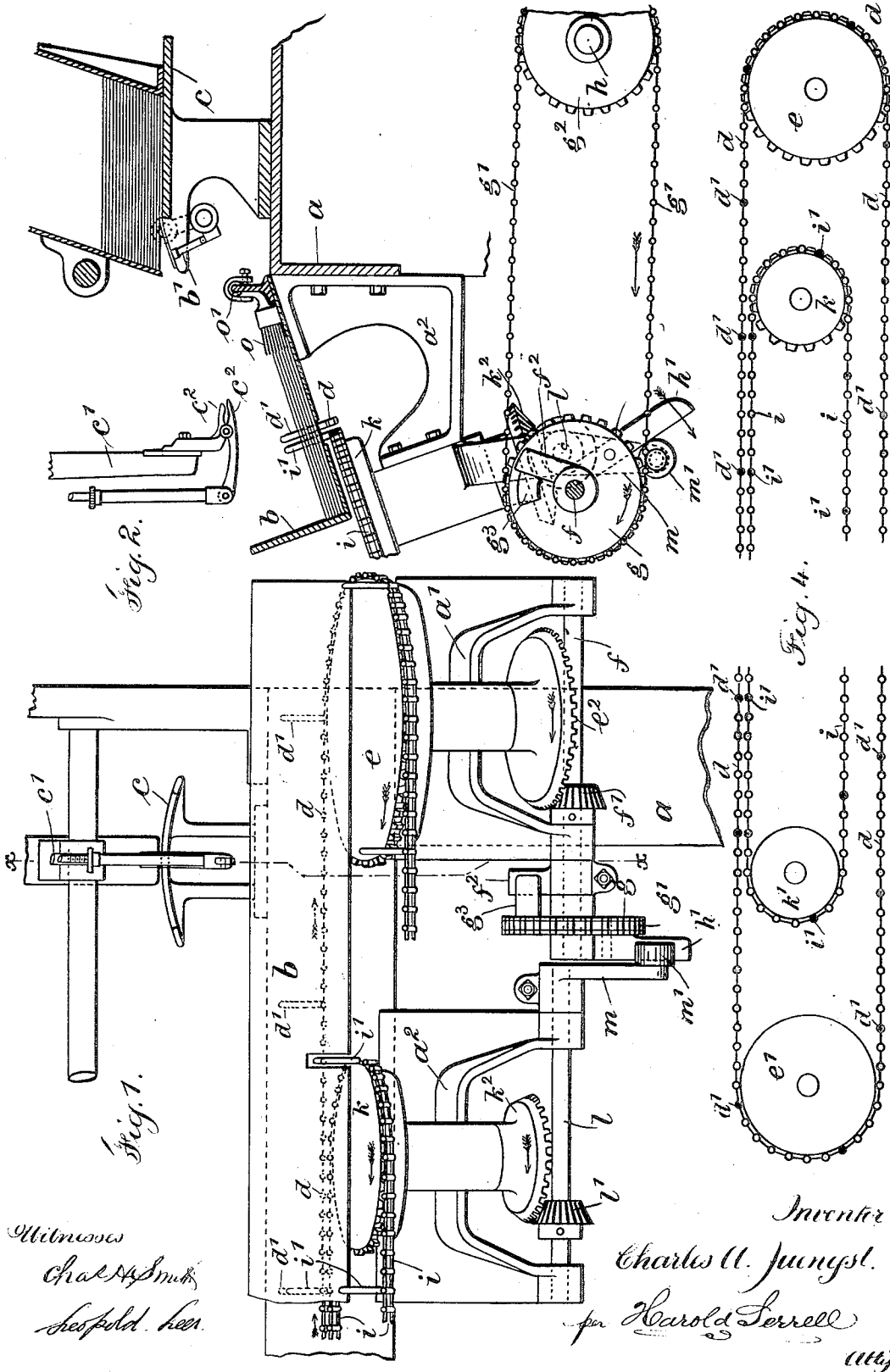
No. 893,510.

PATENTED JULY 14, 1908.

C. A. JUENGST.
SIGNATURE GATHERING MACHINE.

APPLICATION FILED JULY 10, 1906.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 3.

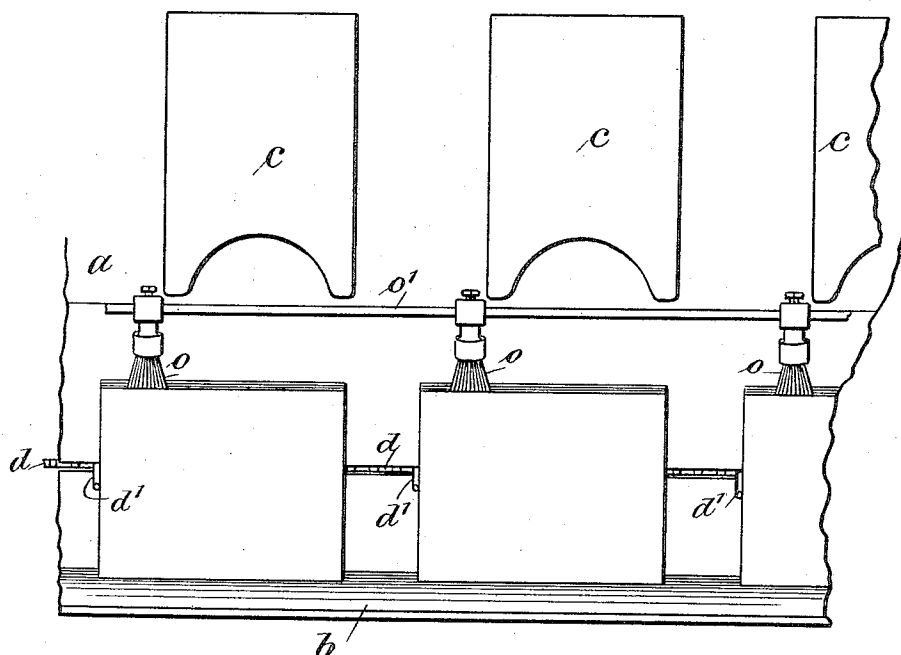
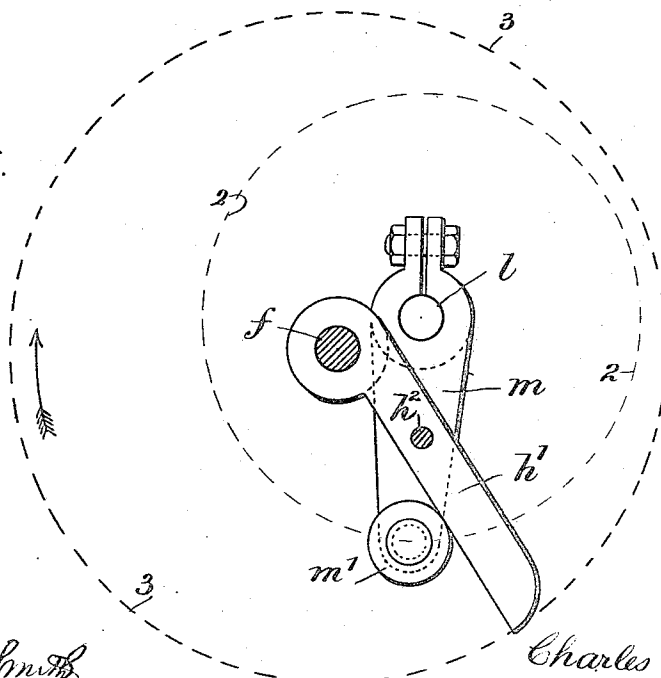


Fig. 5.



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UNITED STATES PATENT OFFICE.

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SIGNATURE-GATHERING MACHINE.

No. 893,510.

Specification of Letters Patent.

Patented July 14, 1908.

Application filed July 10, 1905. Serial No. 268,909.

To all whom it may concern:

Be it known that I, CHARLES A. JUENGST, a citizen of the United States, residing at Croton Falls, in the county of Westchester and State of New York, have invented an Improvement in Signature-Gathering Machines, of which the following is a specification.

My present improvement in signature gathering machines has special reference to the conveying and forwarding devices for the groups of signatures or sheets as they are progressively superimposed.

In collating signatures or sheets special attention is paid to getting the back and upper edges true and strictly in even line as the same is essential for binding and for the alining of the head lines after the upper folded edges are cut, and the object of my invention is the production of devices acting automatically in connection with the conveying and forwarding devices for alining and evening up the signatures or sheets of the groups as progressively superimposed, especially to true and even the backs and upper edges.

In the device of my invention and in combination with the gripper devices for removing the signatures and sheets from the superimposed piles and delivering the same in the signature trough I employ in addition to the conveyer a variable speed auxiliary conveyer timed during a period for an accelerated or more rapid movement over the main conveyer and for an intermediate period for a retarded movement over the main conveyer, and the movement of this device effects a jogging of the signatures or sheets, tending to aline and even up the same. I prefer to so time the operative parts that this jogging movement shall be given to each pile of the superimposed signatures or sheets between the respective place of delivery of the said signatures or sheets to the conveyer so that as the completed piles of signatures or sheets are delivered by the conveyer for binding they are in perfect alinement, at least at the back and upper or top edges.

In the device of my improvement the variable speed auxiliary conveyer for its contact with the piles of superimposed signatures runs side by side and parallel through the conveyer trough with the main conveyer. Both conveyers are, by preference, driven from a power shaft by sprockets and a chain, and each conveyer chain is driven by its sprocket, bevel gears and shaft. These latter shafts are not in line but are slightly

off-set or out of line from one another and are connected for rotation by crank-arms, the driving one of which with its shaft is actuated uniformly by a sprocket of the driving chain, the same crank-arm bearing upon the other or driven crank-arm and obviously by this arrangement of these devices and the eccentricity of the areas swept by the arms, the speed of movement of the parts will vary. This device "*per se*," constitutes a well known mechanical movement for varying the speed of rotation of one of the shafts while the other is constant, the one of variable speed having a more rapid rotation during part of its movement than that of the shaft having a constant speed. This is hereinafter particularly described.

In the drawing, Figure 1 is an elevation at one end of a signature gathering machine showing sufficient of the same to indicate its character and showing the adjacent ends of the main and auxiliary conveyers, their connecting and operating devices. Fig. 2 is an elevation and partial section at the dotted line x, x , at the right hand end of the parts shown in Fig. 1. Fig. 3 is a plan representing a form of my invention and also of so much of the parts shown in Fig. 1 as is necessary to illustrate the relation of the plate supports for the signatures or sheets to the conveyer trough and the superimposed piles of signatures or sheets. Fig. 4 is a broken diagrammatic plan of the main and auxiliary conveyers, and Fig. 5 is a side elevation, partial section and diagrammatic view of the crank-arms and their eccentric rotative relation.

a represents so much of the frame of a signature gathering machine as may be necessary for the support of the brackets a' , a'' , connected thereto, and which brackets are provided with three bearings each for shafts.

b represents the conveyer-trough connected to and supported by the brackets and frame: b' a sucker device of usual character in this art: c plate supports for superimposed piles of signatures or sheets: c' a gripper-arm and c'' gripper fingers as employed in this art, reference hereby being made to my former Letters Patent No. 761,496, dated May 31st, 1904, in which these parts and their operations are fully described.

d is the main conveyer chain and d' pins at intervals connected thereto and rising therefrom.

e is a sprocket at one end around which the

conveyer chain passes and by which it is driven and e' a wheel at the other end of the chain forming a guide therefor. The sprocket e is upon a shaft in a bearing of the bracket a' , and at the lower end of the said shaft is a bevel-wheel e^2 . In other bearings of the bracket a' I place a horizontal shaft f with a bevel pinion f' thereon meshing with the bevel-wheel e^2 . On this shaft f there is a crank-arm f^2 and on the end of the shaft a crank-arm h' . The crank-arm f^2 is clamped to the shaft, while between the crank-arms and loose on the shaft f is a sprocket g , said sprocket g and the crank-arm h' being connected together by a pin h^2 , shown in Fig. 1 in dotted lines and in Fig. 5 in cross section.

h is a power shaft and g^2 a sprocket thereon, g' being a driving chain extending around the sprockets g and g^2 so as to communicate the power of the driving shaft h to the sprocket g . The loose sprocket g is provided with a stud g^3 on one side, the end of which bears against the crank-arm f^2 and with the rotation of the said sprocket g by the driving chain g' , sprocket g^2 and power shaft h , a rotation is imparted to the crank arm f^2 , shaft f and bevel pinion f' . These parts in turn effect the rotation of the bevel pinion e^2 , its shaft, the sprocket e and the main conveyer chain d with its pins d' , the same effecting the progressive movement through the conveyer trough of the piles of superimposed signatures or sheets as laid therein by the said gripper-arms and fingers.

The auxiliary conveyer i is provided with pins i' which rise therefrom. This auxiliary conveyer at one end passes around a sprocket k upon a shaft in a bearing of the sleeve a^2 , and at its other end said auxiliary conveyer passes freely around a wheel k' which acts as a guide therefor. On the lower end of the shaft of the sprocket k is a bevel-wheel k^2 in mesh with a bevel-pinion l' upon a shaft l . This shaft l is shown as occupying a horizontal position in bearings of the bracket a^2 . Upon one end of the shaft l is a crank-arm m clamped thereto, and at its free end carrying a roller m' . The shafts f and l , as will be seen by reference to Figs. 2 and 5, are not on the same line but are offset or out of line in vertical planes and also preferably slightly offset or out of line in horizontal planes, but they come sufficiently close endwise to one another so that the loose sprocket g and its crank-arm h' are in no danger of coming off the shaft f .

Referring to Fig. 5, the dotted circle 2, represents the path of the crank-arm m and its roller m' , and the dotted circle 3 represents the path of the crank-arm h' , from which it will be apparent that these circular paths are eccentric to one another.

In the operation of the device, hereinbefore described, the power shaft h is revolved by any desired or suitable mechanism form-

ing no part of my present invention. By its rotation is imparted to the sprocket g^2 and driving-chain g' , so as to revolve the loose sprocket g on the shaft f and because the crank-arm h' is pinned to the sprocket g these two members turn together about the shaft f as a center. This revolution of the sprocket g through the stud g^3 bearing upon the crank-arm f^2 rotates the shaft f , the bevel-pinion f' , at a constant speed and through the same rotates the bevel-wheel e^2 , its shaft, the sprocket e and causes a travel of the conveyer chain d and its pins d' , and this being the main conveyer and the movement thereof being thereby continuous, the signatures or sheets as collated and superimposed in the conveyer trough are moved along toward the end of the machine. With the rotation of the sprocket g and crank-arm h' in one direction only, said crank-arm is continuously bearing upon the surface of the roller m' of the crank-arm m , and the pressure thus exerted causes the rotation of the crank-arm m , the shaft l , the bevel-pinion l' , the bevel-wheel k^2 , its shaft and the sprocket k , imparting to the auxiliary conveyer i and its pins i' a movement in the same direction as that of the main conveyer chain d and its pins d' .

It is evident, especially from Fig. 5 and from the eccentric paths of the crank-arms h' and m that the roller m' must move over the advancing face of the crank-arm h' as the parts revolve, consequently in one position the roller m' is near the hub of the crank-arm h' and in the opposite position it is near the free end of the crank-arm h' . It will be, therefore, understood that when the roller m' is nearest to the hub of the crank-arm h' the movement imparted thereby to the crank-arm m will be slower than when the roller is near the free end of said crank-arm which occurs at the place where the two dotted circles come nearest together, and at this place the crank-arm m' will be moving the fastest; also it will be apparent that for one-half of the rotation of the crank-arm m and its shaft l , while the roller m' is moving toward the hub of the crank-arm h' , that there will be a retarding action of the movement of the auxiliary conveyer and during the other half of the rotation up to the maximum, an increased or more rapid movement of the auxiliary conveyer. The parts are so placed and timed that the maximum velocity of the movement imparted to the conveyer i and its pins i' takes place substantially simultaneously with or slightly after the delivery of each signature or sheet by the grippers onto the superimposed piles of signatures or sheets in the conveyer trough, thus producing at about the instant of maximum velocity a jogging movement against the corresponding edges of the signatures or sheets; having the function of evening the same up and this

evening movement takes place regardless of the number of superimposed signatures or sheets in the trough that are being carried along by the conveyer.

It will be noticed, especially from Fig. 2, that the conveyer trough is inclined downward toward an edge that is upturned at right angles to the surface upon which the signatures or sheets are delivered. The back edges of the signatures lie against this upturned edge of the trough, therefore, the jogging of the signatures or sheets also has a tendency to settle the same truly along these back edges. I may further assist this function of the conveyer by a series of brushes *o* adjustably mounted upon a rod *o'*, Figs. 2 and 3, the action of these brushes with the progressive movement of the superimposed signatures or sheets, being upon their outer edges tending to feed or brush the same into line, so that all of their top edges will come against the pins *d'* of the conveyer chain, it being a fact that in the form of my invention shown in Fig. 3, the auxiliary conveyer *i* having the pins *i'* may be dispensed with as the brushes *o* with the main conveyer *d* and its pins *d'* are adapted for the performance of the same jogging action or function.

I claim as my invention:

1. A signature gathering machine having in combination, gripper devices, a receiving trough, a forwarding conveyer and means independent of said conveyer acting with a more rapid movement than the conveyer and causing an impact upon corresponding edges of the signatures or sheets as they are superimposed for bringing the same into alinement and coincidence.

2. A signature gathering machine having in combination, gripper devices, a receiving trough, a conveyer chain and means independent of said conveyer chain acting with a more rapid movement than the conveyer and causing an impact upon corresponding edges of the signatures or sheets as they are superimposed for bringing both the back and the upper or top edges into alinement and coincidence.

3. The combination in a signature gathering machine with the gripper devices and a receiving trough for signatures or sheets, of a forwarding conveyer and an auxiliary conveyer located to act on sheets or signatures in the same trough, and means for imparting a variable speed to the auxiliary conveyer.

4. The combination in a signature gathering machine with the gripper devices and a receiving trough for piles of superimposed signatures or sheets, of a forwarding conveyer, an adjacent auxiliary conveyer substantially parallel therewith and acting on the signatures or sheets in the same trough, and means for imparting a variable speed to the auxiliary conveyer timed during one portion of the period for a faster movement than the main

conveyer and during another portion of the period for a slower movement for effecting a jogging of the signatures or sheets.

5. The combination in a signature gathering machine with the gripper devices and a receiving trough for signatures or sheets, of a forwarding conveyer, an adjacent auxiliary conveyer moving in the same direction and means for imparting a periodically variable speed to the auxiliary conveyer, each period being completed between successive deliveries of the signatures or sheets by the grippers.

6. The combination in a signature gathering machine with the gripper devices and a receiving trough for signatures or sheets, of a forwarding conveyer, an auxiliary conveyer and means for imparting a periodically variable speed to the said auxiliary conveyer, the said auxiliary conveyer being timed for regular periodically faster movements than that of the main conveyer for effecting a jogging of the signatures or sheets and for alternating slower movements.

7. In a signature gathering machine, the combination with the gripper devices, a receiving trough for the signatures and sheets and a power shaft, of a shaft and means for actuating the same from the power shaft, another shaft whose axis is parallel with the axis of the second shaft, crank-arms upon adjacent ends of said latter shafts, the one crank-arm being moved by the other, whereby the regular rotation of one shaft imparts a variable rotation to the other, a main conveyer and means for actuating the same from the second of said shafts, an auxiliary conveyer parallel with the main conveyer, and intermediate means for actuating the same from the last of said shafts whereby the main conveyer is given a steady progressive movement and the auxiliary conveyer a variable speed.

8. The combination in a signature gathering machine with the gripper devices and a receiving trough for signatures or sheets, of a forwarding conveyer passing longitudinally through said receiving trough, means for imparting a uniform continuous movement to said main conveyer, an auxiliary conveyer also moving longitudinally of the same trough and parallel with the main conveyer, both conveyers acting on the same signatures or sheets, and means for imparting a variable speed to the said auxiliary conveyer.

9. The combination in a signature gathering machine with the gripper devices and a receiving trough for signatures or sheets, of a forwarding conveyer passing longitudinally through said receiving trough, means for imparting a uniform continuous movement to said main conveyer, an auxiliary conveyer also moving longitudinally of the trough and side by side and parallel with the main conveyer, means for imparting a periodically variable speed to the said auxiliary conveyer,

the said auxiliary conveyer being timed for regular periodically faster movements than that of the main conveyer for effecting a jogging of the signatures or sheets and for alternating slower movements.

10. The combination in a signature gathering machine with the gripper devices and a receiving trough for signatures or sheets, of a forwarding conveyer passing longitudinally through said receiving trough, means for imparting a uniform continuous movement to said main conveyer, an auxiliary conveyer also moving longitudinally of the trough and parallel with the main conveyer, means for imparting a periodically variable speed to the said auxiliary conveyer, the latter means being timed for regular periodically faster movements than the main conveyer for effecting a jogging of the signatures or sheets and for alternating slower movements.

11. In a signature gathering machine, the combination with a power shaft and sprocket thereon and a driving chain actuated thereby, of two shafts out of line from one another and whose axes are parallel, a sprocket loose on one of said shafts around which the driving chain passes, a crank-arm also loose upon said shaft but secured to said sprocket, a crank-arm f^2 secured upon one of said shafts,

a crank-arm m secured upon the adjacent end of the other of said shafts and a roller on the free end of the crank-arm m engaged by the crank-arm secured to the sprocket, a stud g^3 upon said sprocket contacting with the crank-arm f^2 whereby the rotation of the sprocket loose upon one shaft with its crank-arm and stud are adapted to actuate both shafts in the same direction, a main conveyer and intermediate devices connecting the same with one of said shafts to which rotation is imparted by the crank-arm f^2 , an auxiliary conveyer parallel with and closely adjacent to the main conveyer, and devices for actuating the same, substantially as set forth.

12. The combination in a signature gathering machine with the gripper devices, a receiving trough for signatures and sheets and a forwarding conveyer, of a side by side and parallel auxiliary conveyer and means for imparting a variable speed to one of said conveyers.

Signed by me this 23rd day of June 1905.

CHAS. A. JUENGST.

Witnesses:

GEO. T. PINCKNEY,
S. T. HAVILAND.