

F. PHELPS.
COTTON FOLDER.
APPLICATION FILED MAY 12, 1909.

955,542.

Patented Apr. 19, 1910.

3 SHEETS—SHEET 1.

Fig. 1.

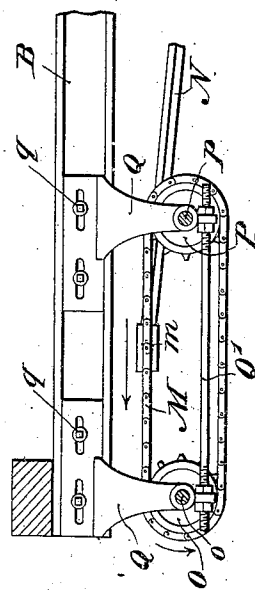
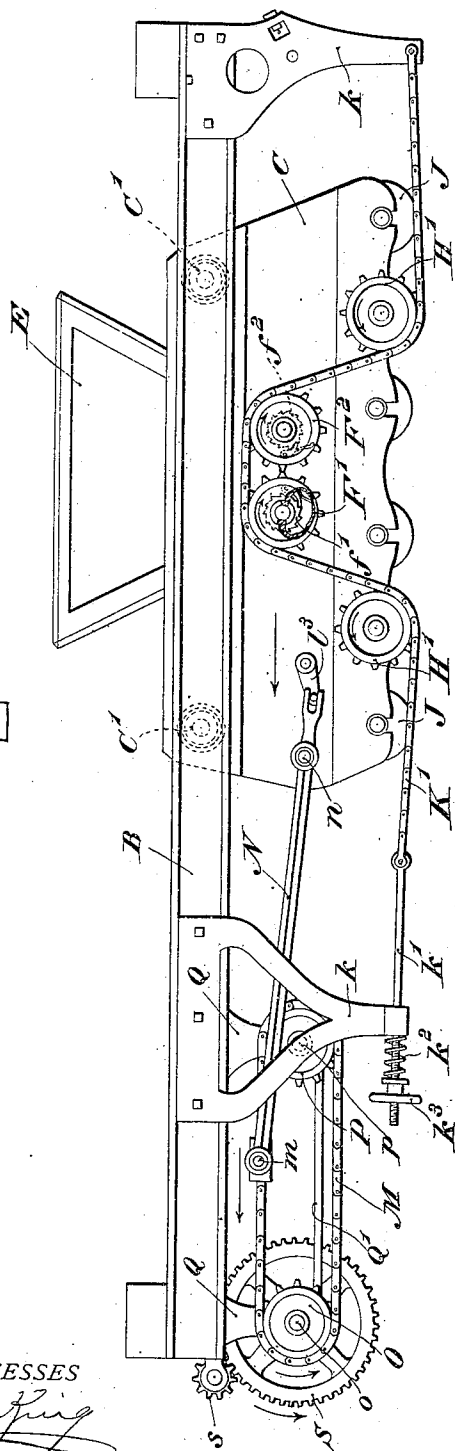


Fig. 2.

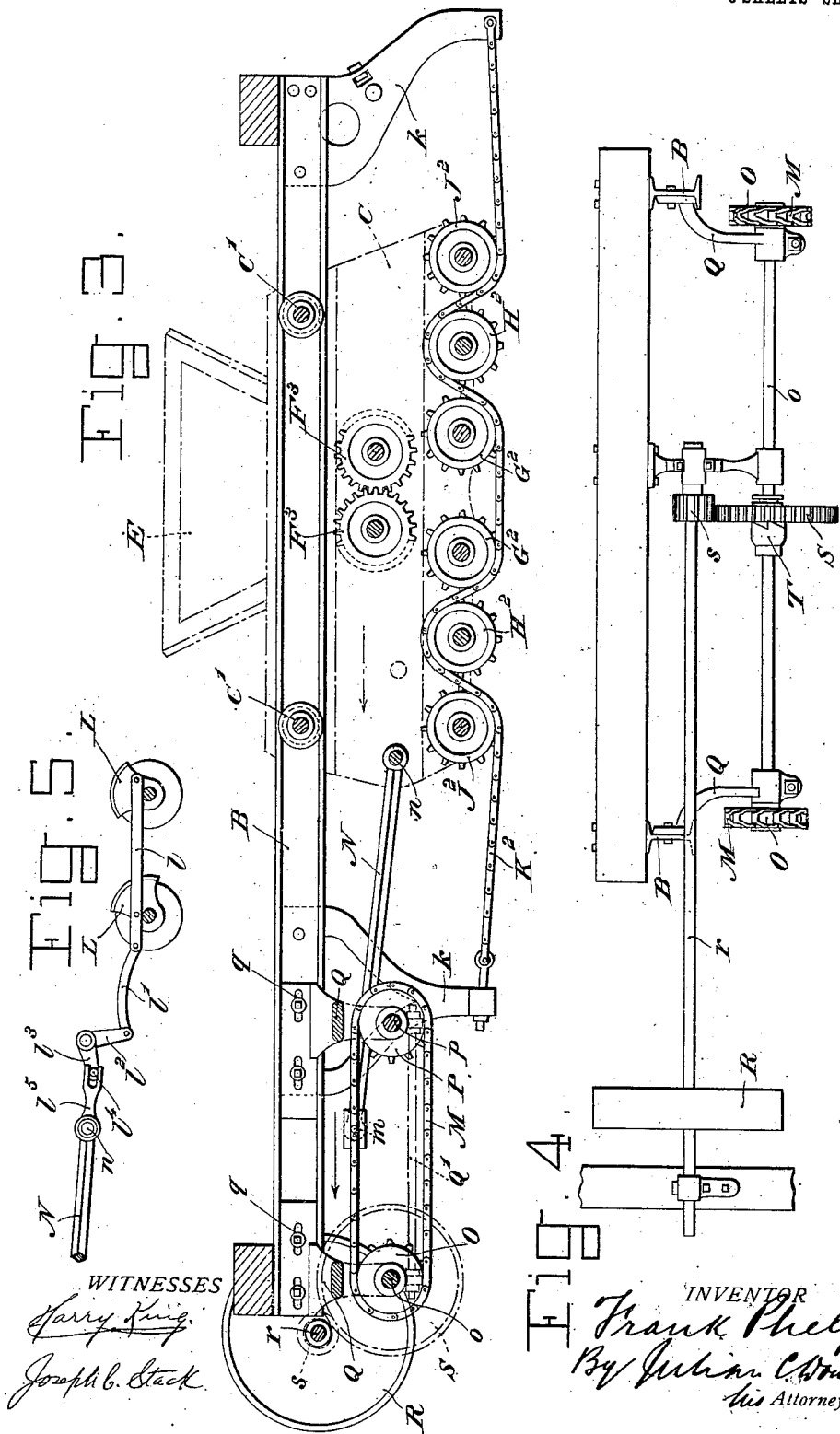
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3 SHEETS—SHEET 2.



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Fig. 4

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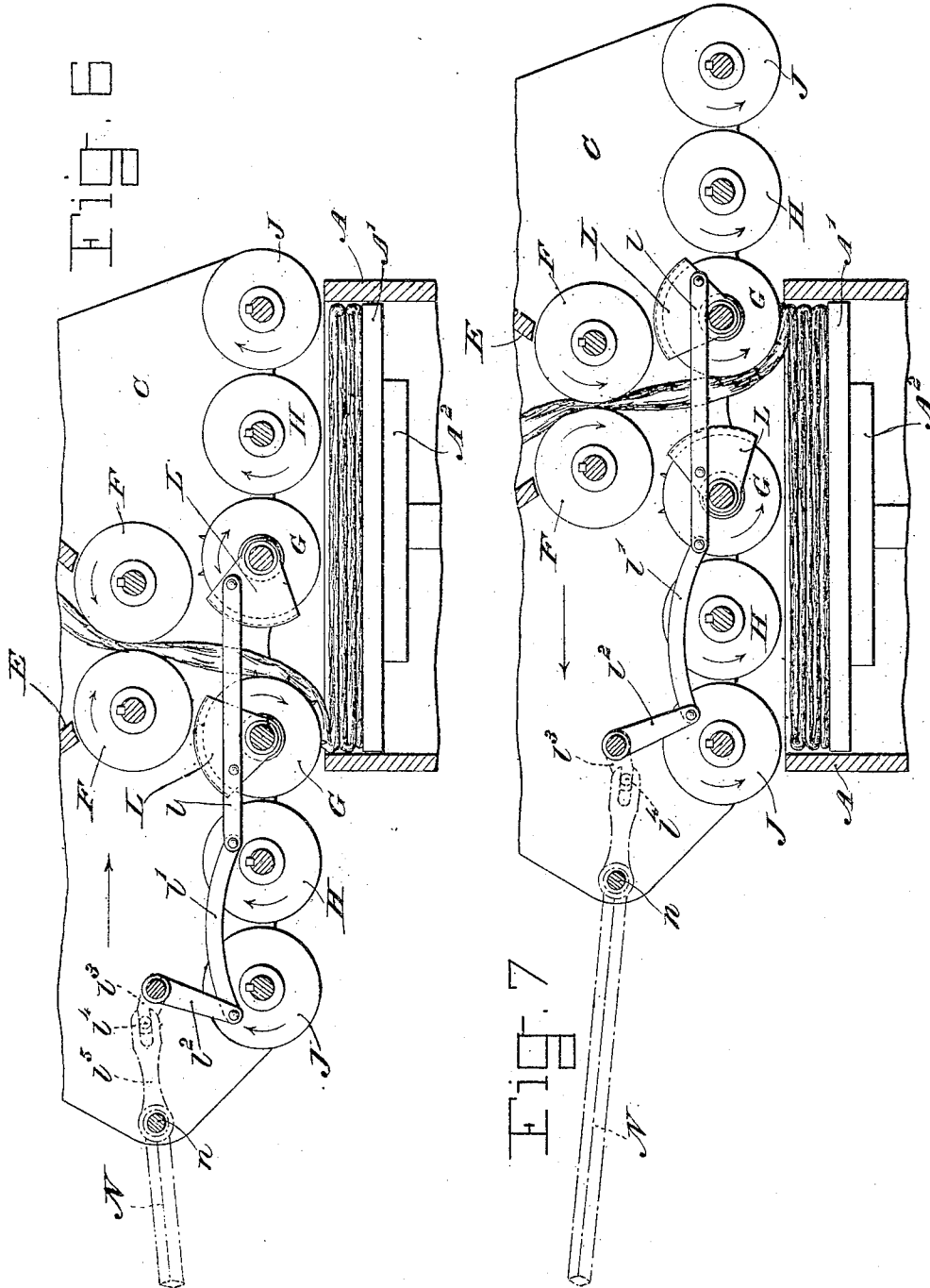
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3 SHEETS—SHEET 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

FRANK PHELPS, OF LITTLE ROCK, ARKANSAS.

COTTON-FOLDER.

955,542.

Specification of Letters Patent. Patented Apr. 19, 1910.

Application filed May 12, 1909. Serial No. 495,525.

To all whom it may concern:

Be it known that I, FRANK PHELPS, a citizen of the United States, residing at Little Rock, in the county of Pulaski and State of Arkansas, have invented certain new and useful Improvements in Cotton-Folders; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to cotton-folders or apparatus used in connection with certain types of cotton-presses for assembling a bat of cotton into folds or superimposed layers, under such degree of pressure as desired, preparatory to compressing the same into a bale.

The main objects of the invention are to provide improved means for reciprocating the carriage, operating the press-rolls, and operating the protective hoods on the folder-rolls, of a cotton-folder of the general character set forth in my Patent No. 931,474, dated Aug. 17, 1909.

The invention will hereinafter be first fully described with reference to the accompanying drawings, which form a part of this specification, and then more particularly pointed out in the appended claims.

In said drawings: Figure 1 is a front elevation of a cotton-folder embodying my invention. Fig. 2 is a detail sectional view of the carriage-drive. Fig. 3 is a longitudinal vertical section on a line immediately behind the carriage, showing a rear elevation of the operating mechanism with the carriage and its hopper indicated by dotted lines. Fig. 4 is a rear elevation of the carriage-drive. Fig. 5 is a detail end view of the folder-rolls with their hoods and operating means. Fig. 6 is a sectional view of the folder in the act of folding the bat at one side of the press-box. Fig. 7 is a similar view of the folder traveling in the opposite direction and folding the bat at the opposite side of the press-box.

B denotes horizontally disposed beams constituting the track-rails for the reciprocatory folder-carriage C, the lateral supporting wheels C¹ of which are or may be arranged to run between the upper and lower flanges of said beams so as to support the weight of the carriage upon the lower flanges while the upper flange takes its upward thrust due to the resistance or pressure ap-

plied by the receding platen A² in the press-box A (Figs. 6 and 7) over which the folder is operating.

Corresponding substantially to the folder disclosed in my said former patent, the carriage C supports a hopper E for receiving the cotton from a condenser or bat-forming apparatus, a pair of coacting bat-condensing and feed-rolls F at the base of the hopper, and two groups or sets of press-rolls G H J in the lower part of the carriage, the said press-rolls being arranged to travel on the same plane and with a space between the central rolls G, which constitute folder-rolls, so that as the carriage reciprocates the bat which is fed from the hopper by the compression or feed-rolls F is folded back and forth by the alternating central press-rolls or folder-rolls G followed by the press-rolls H and J and is thus laid in layers upon the receding follower A¹ in the press-box; it being understood that the follower A¹, supported by the platen A², receives the first layer of cotton at an elevated position and gradually descends as the folds are successively laid one upon the other, at the same time allowing any desired degree of pressure to be exerted upon the accumulating cotton as well understood.

A simplified form of chain and sprocket drive for the rolls is provided as follows: At the front of the apparatus, a taut sprocket-chain K¹, stretched between hangers $\frac{1}{2}$ passes over and engages clutch-connected sprocket-wheels F¹, F² on the shafts of the feed-rolls F, and passes under and engages sprocket-wheels H¹ fast on the shafts of the press-rolls H, being the middle press-roll of each group. The clutches f¹ and f² by which the sprocket-wheels F¹ and F² are connected to their shafts, are arranged to operate reversely, one clutching while the other releases, and each clutch operating only when the sprocket-chain revolves its sprocket-wheel in the direction for feeding the bat, indicated by the arrows in Figs. 6 and 7, but releasing its sprocket from its shaft and allowing it to act as an idler when the sprocket-chain revolves the sprocket-wheel in the contrary direction. At the opposite side or rear of the machine, as shown in Fig. 3, the shafts of the feed-rolls F are provided with intermeshing expansion gears F³, whereby one roll is always revolved from the other; and a second sprocket-chain K², likewise stretched be-

tween hangers h , passes under fast sprocket-wheels J^2 and G^2 on the shafts of the press-rolls J and G , and over loose or idle sprocket-wheels H^2 on the shafts of the middle press-rolls H . Hence, as the carriage reciprocates, the press-rolls will be driven by the sprocket-chains to rotate or roll over the bat in the direction of movement of the carriage, the rolls H being driven by the front sprocket-chain, and the rolls G and J being driven by the rear sprocket-chain, while the feed-rolls F will always revolve oppositely in the direction for feeding the bat from the hopper, irrespective of the direction of motion of the carriage.

As an incidental feature of improvement, the sprocket-chain K^1 is connected to one of the hangers h by a rod h^1 inserted loosely through the hanger and having a spring h^2 interposed between the hanger and a nut h^3 on the rod in such manner that the spring is compressed by tensioning the chain and serves as a buffer. A similar device may be applied to the other sprocket-chain.

The carriage is reciprocated from endless drive-chains M by means of connecting rods N , said rods being pivotally-connected to the chains at m and pivotally-connected to the carriage at n . The drive-chains M , continuously traveling in the same direction, run around sprocket-wheels O and P , the shafts o and p of which are journaled in hangers Q attached to the beams or rails B . The hangers Q are shown adjustably bolted to the beams at q , and their lower ends are connected by adjustable brace rods Q^1 . Power is or may be applied at a pulley R , the shaft r of which has a pinion s meshing with a gear-wheel S on the shaft O , the gear S being connected to its shaft by means of a clutch T for enabling the machine to be thrown into and out of gear. It will be seen that the folder is reciprocated by the passing of the pivot connections m alternately to the upper and lower runs of the drive-chains, said runs traveling in opposite directions. This is a simple, practicable and efficient form of drive and is especially adapted for the purpose. As the pivot-connections m move back and forth on the upper and lower runs of the drive-chains, the folder is reciprocated to travel at a constant speed in either direction while said pivot-connections are moving between the sprocket-wheels O and P , but as the pivot-connections pass around the sprocket-wheels the speed of the folder comes gradually to a standstill and gradually resumes to reverse the motion at the opposite limits of travel of the folder.

The above described driving mechanism is also utilized for operating the segmental hoods L on the folder-rolls G . As explained in the specification of my said former patent, the hoods L , pivotally mounted upon

the shafts of said folder-rolls, are so operated or controlled that the hood of the advancing folder-roll (whichever that may be, depending upon the direction of travel of the carriage) is carried in a raised position, allowing said roll to advance on the bat; while the hood of the receding roll is carried in a downward position confronting the bat. At the end of each travel of the carriage, the upright hood of the advancing roll is thrown down, thereby forcing the bat off said roll, and allowing said roll to reverse, while simultaneously the hood of the receding roll is thrown up to allow said roll to advance upon the bat and fold it back upon the subjacent layer. The accomplishment of this operation in the present machine is by means of a rod l pivotally-connected to the hoods and connected by means of a link l^1 to one arm l^2 of a bell-crank lever mounted on the inner side of the carriage and having its other arm l^3 provided with a stud or pin l^4 engaged by the forked, bifurcated or slotted end of a lever extension l^5 of one of the connecting-rods N . As the pivot-connections m of the carriage-drive pass from the upper to the lower runs of the drive-chains M , or from the lower runs to the upper runs thereof, the lever l^5 rocks the bell-crank and thereby moves the rod l in a direction to throw the hoods in the manner stated.

I reserve the right of such modifications in details of construction and arrangement of parts as may be made within the scope of my invention.

The term "cotton" as used in the following claims is also intended to include any material capable of being folded or packed by this machine.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a cotton-folder, the combination of a reciprocatory carriage, folding mechanism including folding-rolls which advance alternately in opposite directions on a bat fed between said rolls, said folding-rolls provided with hoods operated to hold the hood on the advancing roll raised and that on the receding roll lowered to confront the bat, carriage-driving mechanism, and means operated thereby for shifting or reversing the positions of said hoods on the reversal of movement of the carriage.

2. In a cotton-folder, the combination of a reciprocatory carriage, folding mechanism including folding rolls which advance alternately in opposite directions on a bat fed between said rolls, said folding-rolls provided with hoods operated to hold the hood on the advancing roll raised and that on the receding roll lowered to confront the bat, carriage-driving mechanism including an endless drive-chain and a connecting-rod

connected thereto and to the carriage, and operative connections between said connecting-rod and hoods for shifting or reversing the positions of the hoods as the connecting-rod passes from the upper to the lower run of the drive-chain and vice versa.

3. In a cotton-folder, the combination of a reciprocatory carriage, folding mechanism including folding-rolls which advance alternately in opposite directions on a bat fed between said rolls, said folding-rolls provided with hoods operated to hold the hood on the advancing roll raised and that on the receding roll lowered to confront the bat, carriage-driving mechanism including an endless traveling instrumentality and a connecting-rod, and a shift-rod connected to said hoods and controlled by said connecting-rod.

4. In a cotton-folder, the combination of a reciprocatory carriage, folding mechanism including folding-rolls which advance alternately in opposite directions on a bat fed between said rolls, said folding-rolls provided with hoods operated to hold the hood on the advancing roll raised and that on the receding roll lowered to confront the bat, a rod connecting said hoods, carriage-driving mechanism including a swinging connecting-rod having a lever-extension, a bell-crank lever operated thereby, and a link connecting said bell-crank lever with the rod which connects said hoods.

5. In a cotton-folder, folding-rolls which advance alternately in opposite directions on a bat fed between said rolls, hoods carried by said rolls, a rod connecting said hoods to hold one raised and the other lowered, and means for shifting said rod to reverse the positions of the hoods when the folding-rolls reverse their direction of movement.

6. In a cotton-folder, folding-rolls which advance alternately in opposite directions on a bat fed between said rolls, hoods carried by said rolls, that on the advancing roll being held raised and that on the receding roll being held lowered, and means for operating said hoods comprising a rod connecting them and a lever operatively-connected with said rod and adapted to shift the same in opposite directions as the folding-rolls come to their opposite limits of travel.

7. In a cotton-folder, a reciprocating folder-roll, a hood thereon adapted to maintain a raised position as the roll advances and to maintain a lowered position as the roll moves backward, and a shift-rod connected with the hood and automatically operated to raise and lower the hood at the ends of the opposite travels of the roll.

8. In a cotton-folder, a reciprocating folder-roll, a segmental hood thereon adapted to maintain a raised position as the roll advances and to maintain a lowered position

as the roll moves backward, drive-mechanism, and means operated thereby for controlling said hood.

9. In a cotton-folder, the combination of oppositely-revolving bat-feeding rolls, and a series of press-rolls comprising two sets, of three rolls each, which alternately roll upon the bat which is being folded back and forth, clutch-connected wheels on the feed-roll shafts, the clutches of which operate reversely, drive-wheels on one end of the middle press-roll of each set, a flexible driving element engaging under said drive-wheels and over said clutch-connected wheels, idlers on the opposite ends of said middle press-rolls, drive-wheels on the corresponding ends of the other press-rolls, and another flexible driving element passing alternately over said idlers and under said drive-wheels.

10. In a cotton-folder, the combination of oppositely-revolving bat-feeding rolls, folding-rolls which alternately advance in opposite directions on the bat fed therebetween from the feed-rolls, press-rolls beside or adjacent to the folding-rolls, a flexible driving element engaging under drive-wheels on said adjacent press-rolls and over clutch-connected wheels the clutches of which operate reversely on the feed-rolls, and another flexible driving element passing over idlers on said press-rolls and under drive-wheels on said folding-rolls.

11. In a cotton-folder, the combination of oppositely-revolving bat-feeding rolls, and a series of press-rolls comprising two sets which alternately roll upon the bat which is being folded back and forth, a sprocket-chain or other flexible driving element engaging fast sprockets or drive wheels only on alternate press-rolls and clutch-connected sprockets or wheels the clutches of which operate reversely on the feed-rolls, and another sprocket-chain or flexible driving element engaging alternating fast and loose sprockets or wheels on the press-rolls, the loose sprockets or wheels being on the same press-rolls which carry the fast sprockets or wheels engaged by the first-mentioned sprocket-chain or flexible driving element.

12. In a cotton-folder, the combination of oppositely-revolving bat-feeding rolls F, F and a series of press-rolls comprising two sets G, H, J, which alternately roll upon the bat which is being folded back and forth, a sprocket-chain passing under fast sprockets on the middle press-roll H of each set and over clutch-connected sprockets the clutches of which operate reversely on the feed-rolls F, F, and another sprocket-chain passing under fast sprockets on the rolls G and J and over loose or idle sprockets on the rolls H.

13. In a cotton-folder, the combination of oppositely-revolving bat-feeding rolls, fold-

ing-rolls which alternately advance in opposite directions on the bat fed therebetween from the feed-rolls, press-rolls beside or adjacent to the folding-rolls, a sprocket-chain
5 passing under fast sprockets on said press-rolls and over clutch-connected sprockets the clutches of which operate reversely on the feed-rolls, and another sprocket-chain passing over loose or idle sprockets on said
10 press-rolls and under fast sprockets on said folding-rolls.

14. In a cotton-folder, the combination with a reciprocating carriage and folding mechanism carried thereby comprising rolls,

a taut chain or other flexible driving element and sprockets or wheels for driving said rolls, fixtures to which the ends of the said chain or flexible element are attached, and a spring interposed between a fixture and the said chain or flexible element and yieldingly tensioning the latter. 15 20

In testimony whereof I affix my signature, in presence of two witnesses.

FRANK PHELPS.

Witnesses:

A. E. MOORE,

H. A. BABBITT.