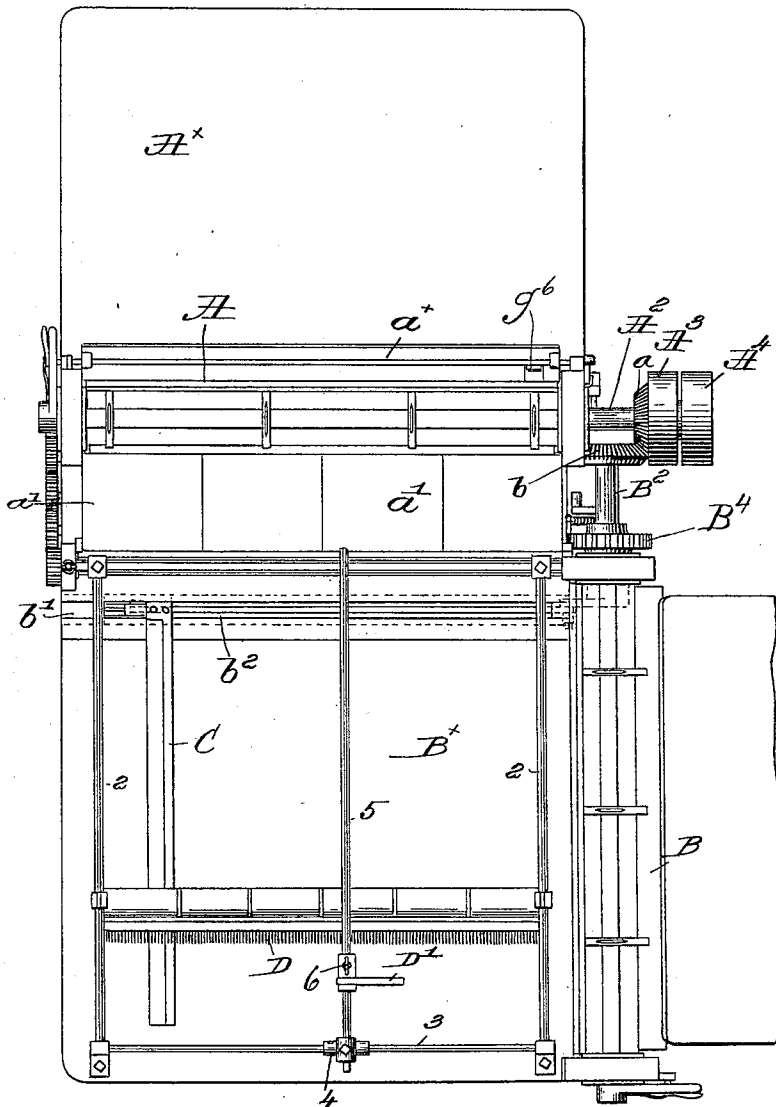


2 Sheets—Sheet 1.

No. 582,878.

Patented May 18, 1897.

Fig:1.



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by Leroy Longmy. *Ways.*

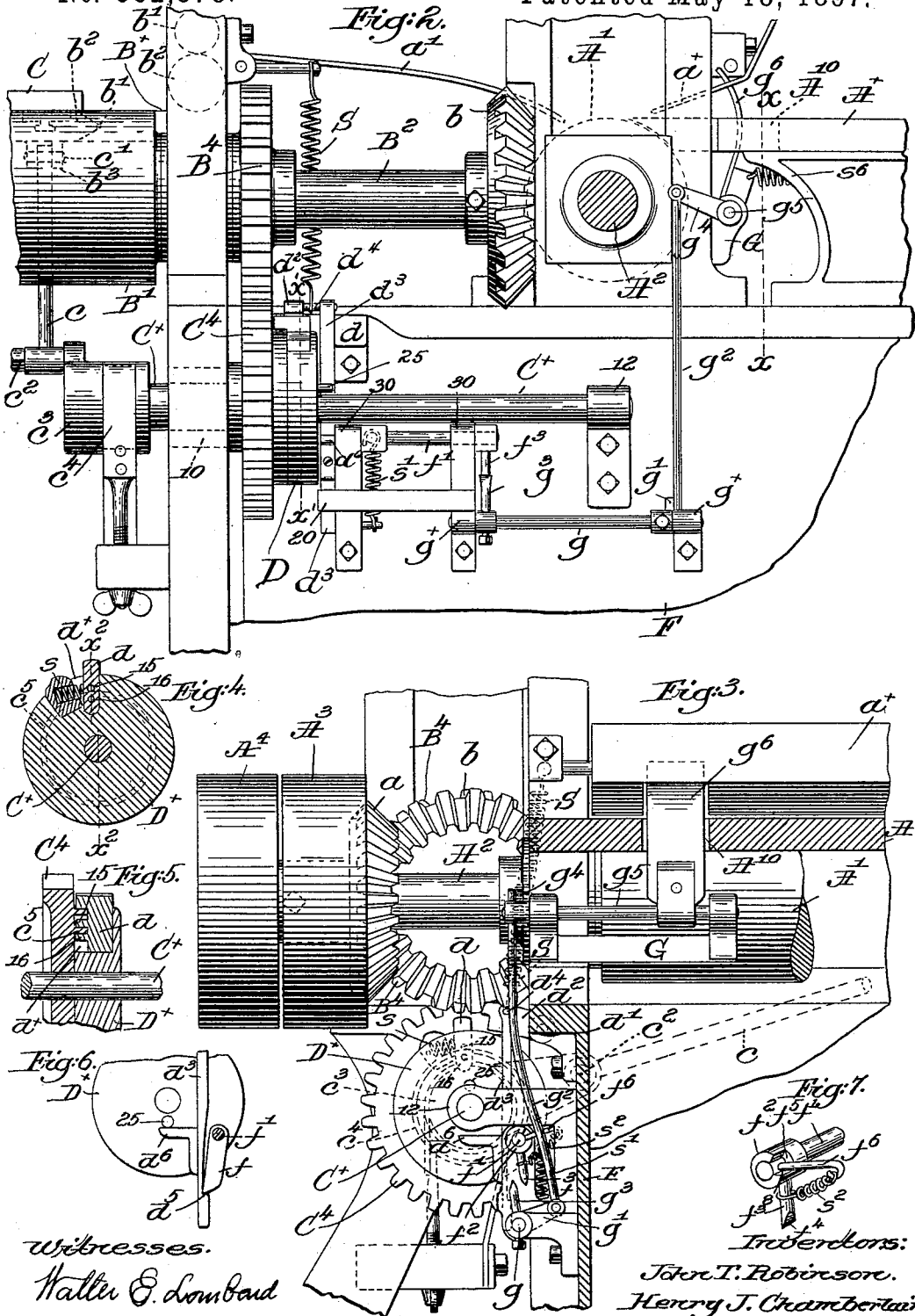
(No Model.)

2 Sheets—Sheet 2.

J. T. ROBINSON & H. J. CHAMBERLAIN.
PAPER SCORING APPARATUS.

No. 582,878.

Patented May 18, 1897.



Witnesses.

Hall & Lombard

Thomas Drummond

Inventors:
John T. Robinson.
Henry J. Chamberlain
by Henry Gregory, attys.

UNITED STATES PATENT OFFICE.

JOHN T. ROBINSON AND HENRY J. CHAMBERLAIN, OF HYDE PARK, MASSACHUSETTS, ASSIGNORS TO JOHN T. ROBINSON & CO., OF SAME PLACE.

PAPER-SCORING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 582,878, dated May 18, 1897.

Application filed December 1, 1896. Serial No. 614,054. (No model.)

To all whom it may concern:

Be it known that we, JOHN T. ROBINSON and HENRY J. CHAMBERLAIN, of Hyde Park, county of Norfolk, State of Massachusetts, have invented an Improvement in Paper-Scoring Apparatus, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates more particularly to apparatus for double-scoring paper, wherein primary and secondary scoring mechanisms are arranged to act successively upon the work, scoring it in two directions, usually at right angles to each other, means being provided for changing the direction of the work after it emerges from the primary scoring mechanism to feed it to the secondary scorer. In such apparatus the work is fed to the primary scorer sheet by sheet, usually and preferably by hand, and as each sheet passes from said scorer it is engaged by a suitable mechanical cross-feed to feed it to the secondary scorer. The feeding to the primary scorer is dependent upon the skill of the operator and upon the condition of the work, for if some of the sheets are under or over size, torn, or upside down the operator must interrupt the feed long enough to correct such conditions of the work. The operator must, consequently, watch not only the work as it passes under his hand, but he must also watch the movement of the cross-feed, so as to avoid fouling two or more sheets, and to regulate the primary or manual feed so that a sheet will be delivered from the primary scorer when the cross-feed is in proper position to engage it.

In order to relieve the attendant of the necessity for watching the mechanical cross-feed we have devised means whereby the cross-feed will not be operated to act upon the sheet passed through the primary scorer until the controlling means for the cross-feed actuator is operated, either by hand or by the feeding movement of the next sheet to such primary scorer, so that the attendant may begin feeding sheets to the primary scorer at any time. Accordingly when a sheet is fed to the primary scorer it passes therethrough to a

suitable table or support, provided with a stop-gage and a normally stationary cross-feed gage, and the sheet remains inert on the support. When another sheet is fed to the primary scorer by the attendant, before the sheet is engaged thereby it will act upon the controlling means for the cross-feed actuator, causing said actuator to instantly move the gage forward and back once, feeding the first sheet to the secondary scorer before the second sheet has even been fully engaged by the primary scorer. By such construction the interference of two successive sheets is absolutely prevented, and the thickness or character of the sheet has nothing whatever to do with the operation of the controlling means, it only being necessary to bring the leading edge of a sheet into engagement therewith to operate it. The location of the said controlling means to be engaged is such that a new sheet cannot be presented to the action of the primary scorer without first operating said controlling means, and the feed-gage will have been operated and returned to normal position before the leading edge of the new sheet passes in front of it, owing to the distance between the primary scorer and the table and the short quick stroke of the feed-gage. As a sheet remains quiet upon the table after passing through the primary scorer until the controlling means is operated great facility is attained in adjusting the stop and feed gages to the size of the sheets to be scored.

The operator feeds in one sheet, and he can then quietly and easily adjust the gages until they are correctly positioned, after which the lightest touch upon the controlling means operates to instantly effect the feed of the sheet to the secondary scorer, and this operation can be repeated until the adjustment is made exact.

Various other novel features of our invention will be hereinafter described in the specification, and particularly pointed out in the claims.

Figure 1 is a top or plan view of a double-scoring apparatus with our present invention applied thereto. Fig. 2 is an enlarged detail view in elevation of the actuating mechanism

for the cross-feed gage and the controlling means therefor. Fig. 3 is a partial sectional view thereof on the line xx , Fig. 2. Fig. 4 is a vertical sectional view of the clutch forming a part of the feed-gage-actuating mechanism on the line $x'x'$, Fig. 2. Fig. 5 is a partial transverse sectional view of the clutch on the line x^2x^2 , Fig. 4. Fig. 6 is a detail of part of the controlling means, to be described; and Fig. 7 is perspective detail of the releasing mechanism for the clutch.

Referring to Fig. 1, two scoring mechanisms A and B, of usual construction, having scoring knives or cutters to cooperate with bed-rolls A' and B', are shown as located at right angles to each other, a feed-table A^x supporting the work to be fed by an attendant sheet by sheet to the primary scoring mechanism A. The main driving-shaft A², to which the bed-roll A' is secured, has usual fast and loose pulleys A³ A⁴ and a bevel-gear a in mesh with a like gear b , fast on the shaft B³ of the secondary bed-roll B', to thereby rotate the bed-rolls. A suitable downhold a^x presses the leading edge of the sheet upon the table A^x as it is fed to the primary scorer, while an apron a' of usual construction directs the scored sheet to suitably-operated feed-rolls $b'b^2$, whence the sheet is delivered to an intermediate table or support B^x and upon which it lies inert until positively fed to the secondary scorer.

Referring to Fig. 1, suitably-supported rods 2 2 above the table B^x support a downhold D, preferably flexible, as shown in another application, Serial No. 602,038, filed August 7, 1896, by us, and another, a third rod 3, being secured at the outer side of the table substantially parallel to the primary scorer. Upon this rod is mounted an adjustable collar 4, to which is secured a stop-gage carrier 5, from which depends a stop-gage D', held in adjusted position on the rod or carrier 5 by a suitable set-screw 6, to engage the leading edge of and stop the sheet passed through the primary scorer A. As in said application the table D is grooved at b' to receive a reciprocable cross-head b^2 , to which the cross-feed gage C is suitably secured, the cross-head 50 having a short stroke sufficient to enable the feed-gage to engage one side of the scored sheet and feed it forward to the secondary scorer B.

The feed-gage C passes beneath the downhold D and is adjustable on the cross-head for sheets of different widths, and said gage is normally at rest in retracted position, as shown in Fig. 1.

A connecting rod or pitman c is pivoted at c' to ears b^3 (see dotted lines, Fig. 2) on the cross-head and depending through the slotted bottom of the groove b' , the other end of the rod c being pivotally mounted on a wrist or crank pin c^2 on a hub c^3 , fast on a rotatable shaft C^x, mounted in suitable bearings 10 and 12 of the main frame.

Around the hub c^3 we have shown a suit-

able adjustable friction band-brake c^4 to hold the shaft and attached parts from accidental movement when not in operation.

Secured to the shaft B³ a gear B⁴ is in mesh with and continuously rotates a gear C⁴, loose on the shaft C^x and forming one member of a clutch of suitable construction, the member C⁴ having, as herein shown, an annular flange or rib c^5 on its inner face, Figs. 5 and 6, to be straddled by two lugs or projections 15 16 on a clutch-dog d , mounted to rock in a recess d^x of the cooperating clutch member D^x, fast on the shaft C^x.

A spring s normally tends to throw the dog b into non-radial position, Figs. 3 and 4, to lock the clutch members together and thereby effect rotation of the shaft C^x and consequent reciprocation of the cross-feed gage C, but when the dog is moved into radial position against the action of the spring the lugs 15 16 release the flange c^5 and disconnect the clutch members.

The clutch mechanism herein described is not of our invention, and no claim is herein made thereto, and if desirable other suitable clutch mechanism may be substituted therefor without departing from our invention.

Upon the main frame F is pivoted at d' a controlling-detent d^2 for the clutch, preferably having a notched end, as shown, movable into the path of and to engage the dog d to release the clutch members and positively stop the rotative movement of the shaft C^x at a predetermined point, the movement of the detent being such as to allow one complete rotation of the shaft at each operation to thereby move the feed-gage C toward the secondary scorer B and back again to normal position. A strong spring S, fixed at one end, is secured at the other end to the detent d^2 to disengage it from the clutch-dog d at the proper time, and a depending slide-rod d^3 is pivoted at d^4 on the detent, sliding in a bearing 20, Fig. 2. This rod, as best shown in Fig. 6, is cut away at one side to form a shoulder d^5 , preferably having a slight downward incline or bevel to be engaged, when the rod is depressed as in the drawings, by a trigger f , the trigger and slide-rod being preferably made of hardened steel and polished to reduce friction. When the trigger is set, the detent d^2 is securely held in the path of the dog d against the tension of the releasing-spring S, the downward movement of the slide-rod into locking position being effected by a pin or projection 25 on the side of the clutch member D^x, said pin in the rotation of said member engaging a strut d^6 on the slide-rod, as shown in Fig. 5. The pin reaches its lowest position after the dog d has passed beyond the detent d^2 , so that the latter is locked when the clutch has made about one-half of a revolution.

The trigger f is fast on a rock-shaft f' , Figs. 2, 3, and 7, mounted in bearings 30 on the main frame, a spring s' normally turning said rock-shaft to throw its trigger into engage-

ment with the shoulder d^5 as soon as the latter is brought into position, the pin 25 releasing the slide-rod when locked by the trigger. Obviously withdrawal of the trigger from its coöperating shoulder d^6 will permit the spring S to withdraw the detent from the dog d , releasing the clutch, which is thrown into operation by the spring s of the clutch-dog. Rocking of the shaft f' to withdraw the trigger is effected by very simple and strong but extremely sensitive means, and by an arrangement of levers the trigger can be operated by the lightest touch, either by a sheet of paper or by the finger of the operator.

15 A collar f^2 (see Fig. 7) is mounted loosely on the rock-shaft f' , and a hardened-steel finger f^3 , having a preferably chisel-pointed tip f^4 , is secured to said collar, the latter being slotted at f^5 for a pin f^6 in the shaft, connected by a spring s^2 with the finger, the spring normally holding the finger in the position shown in Figs. 3 and 7 with the side 8 of the slot against the pin f^6 .

A rock-shaft g , mounted in bearings g^x , Fig. 2, has fast thereon a finger g^3 , similar to and movable in the path of the finger f^3 , the finger g^3 , when swung to the right, Fig. 3, engaging finger f^3 , swinging it to rock the shaft f' and withdraw the trigger f from the shoulder d^5 . As the finger g^3 completes its swing it wipes past the finger f^3 , and the spring s' immediately is free to return the rock-shaft f' to normal position, and when the finger g^3 swings back to the left, Fig. 3, it again wipes past finger f^3 , which, with its collar f^2 , yields to permit it, the spring s^2 returning finger f^3 to operative position. A short arm g' on rock-shaft g is pivotally connected to one end of a link g^2 , the other end of which is pivoted to a longer arm g^4 on a rock-shaft g^5 , mounted to rock in a stand G below the feed-table A^x in front of the primary scorer A. The table is slotted at A¹⁰, Figs. 2 and 3, to permit the passage therethrough of a controlling-arm g^6 , fast at its lower end on the rock-shaft g^5 and preferably curved to correspond to the curvature of the bed-roll A', the downhold a^x being cut away at a^{10} to permit the arm g^6 to swing. A spring s^6 , Fig. 2, returns the said controller to the position shown when free to move, the spring acting upon and through the intermediate connections described to move the finger g^3 into normal position.

The various lever-arms between the finger g^3 and the controller g^6 so increase the power that the lightest touch upon the said controller, whether by the finger of the attendant or by the leading edge of a sheet of material, is sufficient to swing the finger g^3 against and to move the finger f^3 , resulting in the withdrawal of the trigger f from its shoulder and unlocking the clutch-detent, so that said arm g^6 acts as a controller for the feed-gage-actuating mechanism.

65 While the actuating-spring S for the detent is a strong one, holding the shoulder d^5 firmly against the trigger, it really requires very lit-

tle power to withdraw the latter, owing to the leverages, the slight friction between the trigger and shoulder, and the downward bevel of the latter.

The controller g^6 is located in front of the primary scorer, so that if moved by a sheet being fed thereto it must be engaged thereby before such sheet is at all engaged by the scoring mechanism. As the sheet is moved forward it rocks the controller in the construction herein shown toward the bed-roll, releasing the cross-feed-actuating mechanism, and the gage is moved forward and back once, the sheet maintaining the controller more or less depressed while passing over it. It matters not, however, whether the sheet is long or short, nor how long the controller is depressed, the cross-feed gage will make but one forward stroke and its return stroke before coming to rest, for after the controlling means sets the gage-actuating mechanism into motion the latter continues to operate only through one complete cycle and is automatically brought to a stop at a fixed point. Consequently the cross-feed gage may be actuated once each time the controlling means is moved into abnormal position, whether such movement is effected by the feed of a sheet to the primary scorer or by direct movement by the attendant.

The connections between the cross-feed gage and the continuously-rotated shaft B³, including the clutch, constitute actuating mechanism for the gage, which is governed as to its operation through the clutch-detent, its locking and releasing devices by the controller, movable either manually or by a sheet as it is fed toward the primary scorer.

Our invention is not restricted to the precise details or arrangement of construction herein shown and described, for various changes may be made therein without departing from the spirit and scope of our invention.

Having fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a paper-scoring apparatus, primary and secondary scorers, a table between them, a movable feed-gage, to feed a sheet to the secondary scorer, actuating mechanism to reciprocate said feed-gage intermittingly, and controlling means for said mechanism, out of range of the sheet to be fed by said gage and automatically operated by the initial feed of another sheet, substantially as described.

2. In a paper-scoring apparatus, primary and secondary scorers, a table between them, a movable feed-gage, actuating mechanism to reciprocate it intermittingly to feed a sheet on the table to the secondary scorer, and controlling means for said mechanism, located in front of the primary scorer, and adapted to be operated by a sheet as it is fed toward said primary scorer, substantially as described.

3. In a paper-scoring apparatus, primary and secondary scorers located at right angles

to each other, a table between them, a cross-feed gage thereon, actuating mechanism for said gage, to reciprocate it intermittingly to feed a sheet on the table to the secondary scorer, and a movable controller for said mechanism, located in front of the primary scorer, to be operated by a sheet as it is fed toward said scorer, substantially as described.

4. In a paper-scoring apparatus, primary and secondary scorers, a table between them, a movable feed-gage thereon, actuating mechanism to reciprocate said gage intermittingly and including a clutch, a controlling device for said mechanism operated automatically by the initial feed of another sheet, and independently of the sheet to be fed by said gage, a detent for the clutch, a lock for said detent, and means to unlock the detent upon operation of the controlling device, substantially as described.

5. In a paper-scoring apparatus, primary and secondary scorers, a table between them, a movable feed-gage thereon, actuating mechanism to reciprocate said gage intermittingly and including a clutch, a controlling device for said mechanism, operated independently of the sheet to be fed by said gage, a detent for the clutch, a lock for said detent, automatically set by rotation of the clutch when released, and independent means to unlock the detent when said controlling device is operated by a sheet as it is fed toward the primary scorer, substantially as described.

6. In a paper-scoring apparatus, primary and secondary scorers, a table between them, a movable feed-gage thereon, actuating mechanism to reciprocate said gage intermittingly and including a clutch, a controlling device for said mechanism operated independently of the sheet to be fed by said gage, a detent for the clutch, a trigger to lock the detent, means operative by rotation of the clutch, to set the trigger, a trigger-finger, a second finger coöperating therewith to release the trigger, and connections between the controlling device and the second finger, whereby when said device is operatively moved the clutch will be released, substantially as described.

7. In a paper-scoring apparatus, an intermittingly-reciprocated feed-gage, actuating

mechanism therefor, including a clutch; a detent for the clutch, a spring to withdraw the detent, means operative by movement of the clutch to positively return the detent to operative position and to lock it, an independent unlocking device, comprising two fingers to coöperate one with the other, a controlling device, and connections between it and one of said fingers, whereby movement of said controlling device will release the clutch to operate the feed-gage, substantially as described.

8. In an apparatus for treating material in sheet form, a plurality of sets of devices to operate successively upon the work, intermittingly-acting mechanism to feed the work to one of said sets of devices, and controlling means for said mechanism automatically operated by a following sheet to thereby effect the feed of a preceding sheet, substantially as described.

9. In an apparatus for treating material in sheet form, a plurality of devices to act successively upon the work, a table between them, a reciprocating feed to move the work over said table to one of said devices, actuating mechanism to reciprocate said feed intermittingly, and controlling means for said mechanism, automatically operated by a following sheet to thereby effect the feed of a preceding sheet, substantially as described.

10. In an apparatus for treating material in sheet form, primary and secondary devices to operate successively upon the work, intermittingly-acting mechanism to feed the work to the secondary device, and controlling means for said mechanism, automatically operated by feed of a sheet to the primary device, whereby the feed of another sheet to the secondary device is mechanically effected, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOHN T. ROBINSON.
HENRY J. CHAMBERLAIN.

Witnesses:

JOHN C. EDWARDS,
AUGUSTA E. DEAN.