

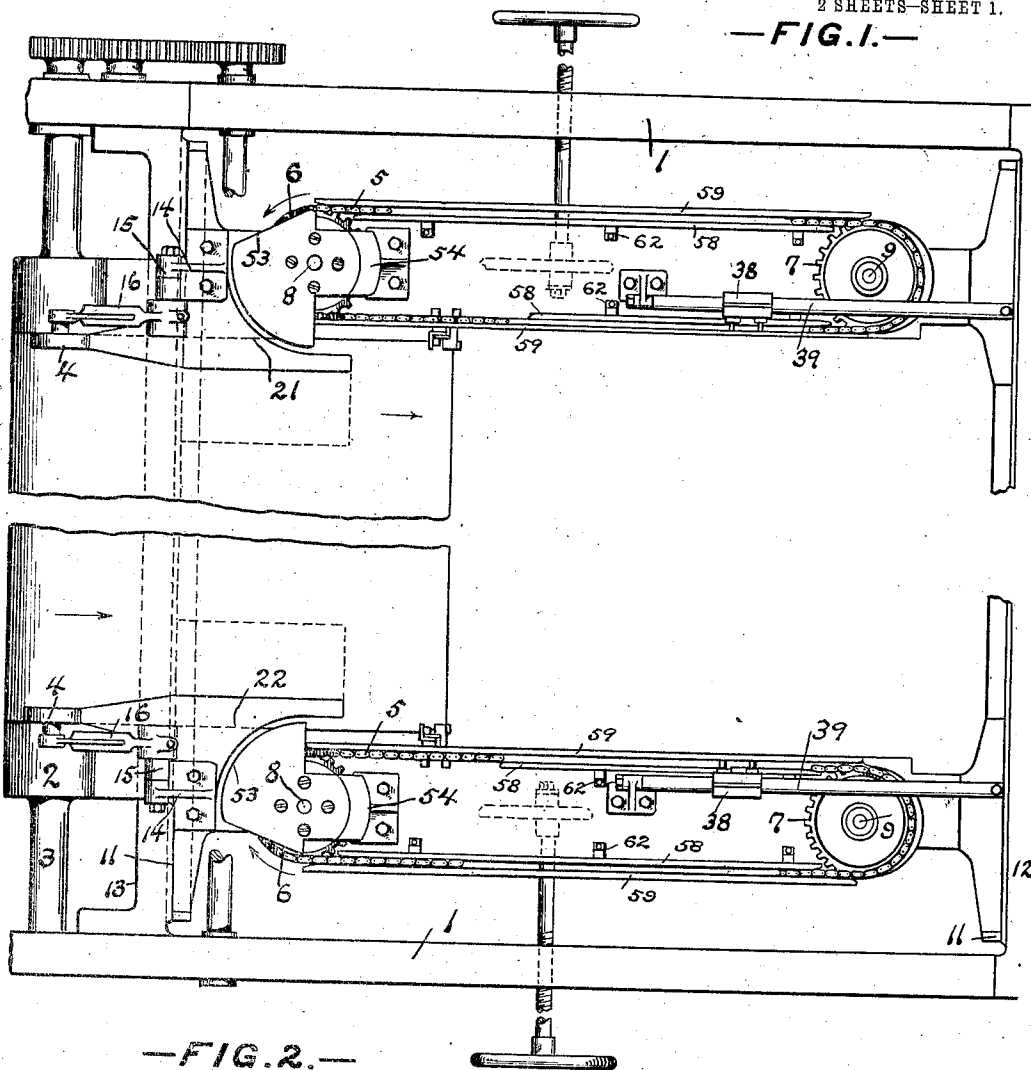
E. P. SHELDON.
SHEET DELIVERY MECHANISM.
APPLICATION FILED JUNE 9, 1911.

1,050,857.

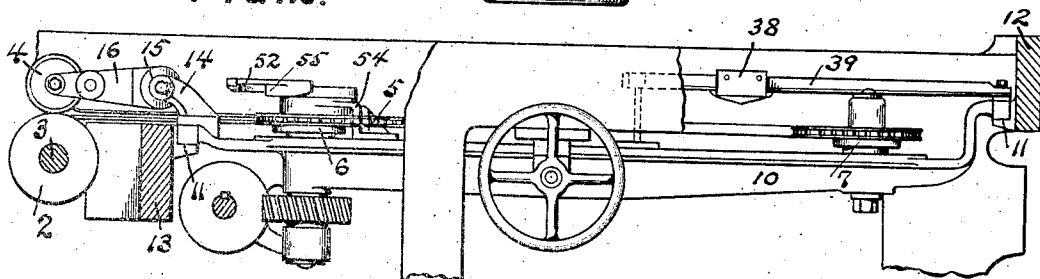
Patented Jan. 21, 1913.

2 SHEETS—SHEET 1.

—FIG. 1.—



—FIG. 2.—



WITNESSES.

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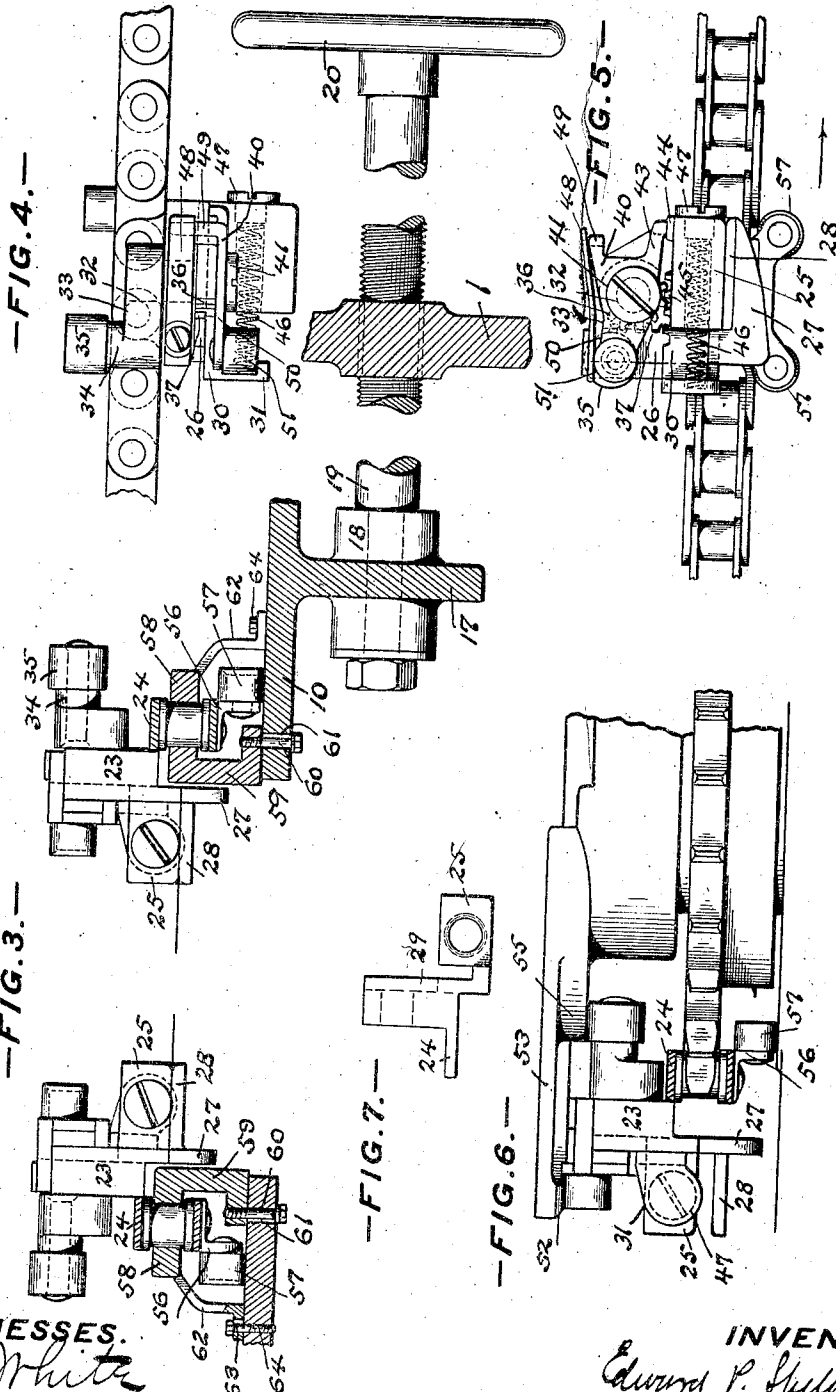
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UNITED STATES PATENT OFFICE.

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SHEET-DELIVERY MECHANISM.

1,050,857.

Specification of Letters Patent.

Patented Jan. 21, 1913.

Application filed June 9, 1911. Serial No. 632,118.

To all whom it may concern:

Be it known that I, EDWARD P. SHELDON, a citizen of the United States, residing at New York, county of Kings, and State of New York, have invented certain new and useful Improvements in Sheet-Delivery Mechanism, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to improvements in sheet delivery mechanism.

The invention has for its object to produce a simple, compact and effective sheet delivery mechanism requiring but little space for its installation and capacitated to run at high speeds.

With this and other objects not specifically referred to in view, the invention consists in certain constructions, and in certain parts, improvements and combinations as will be hereinafter fully described and then specifically pointed out.

Referring to the accompanying drawings—Figure 1 is a plan view of a sheet delivery mechanism embodying the invention. Fig. 2 is a sectional view on the line 2—2 of Fig. 1, certain parts being shown in elevation. Fig. 3 is a detail sectional view illustrating more particularly the gripper mechanisms employed, these mechanisms being shown in front elevation. Fig. 4 is a plan view of one of the gripper mechanisms shown in Fig. 3. Fig. 5 is a side elevation of the gripper mechanism shown in Fig. 3. Fig. 6 is a sectional detail view illustrating the operation of the gripper actuating devices at the sheet taking point. Fig. 7 is a detail view of a part of one of the gripper mechanisms employed.

In the drawings, which illustrate one embodiment of the invention, 1 indicate the side frames in which the mechanism is mounted, which side frames may be extensions of the side frames of the machine with which the delivery mechanism is employed. In the mechanism shown, the sheets are fed from the printing machine or other source over a driven roll 2 mounted on a shaft 3 supported in side frames, a pair of propeller rolls 4 being shown as cooperating

with this roll 2 and arranged to bear on the margins of the sheets.

Mechanism embodying the invention will include a pair of flexible gripper carriers which may be said to travel in a plane parallel to the sheet path, although mathematically speaking, this definition is not exact, as strictly speaking these carriers travel between two planes both of which are parallel to the sheet path. The construction of these flexible gripper carriers may be varied, but in the best constructions embodying the invention, they will, as shown, consist of chains, as 5.

The means for operating the carriers may be varied, but in the particular construction illustrated, each chain passes around a driven sprocket wheel 6 and around an idle sprocket wheel 7, the wheels 6 being mounted on shafts 8 and the wheels 7 on shafts 9, these shafts 8 and 9 being normal or at right angles to the plane of the sheet path. In the best constructions embodying the invention, these gripper carriers will be so mounted as to enable them to be adjusted with respect to the path of the sheet, such an adjustment making it possible to properly adjust the grippers mounted on the carriers and to properly position the parts of the delivery mechanism so as to operate on sheets of different widths. While this adjustment may be secured in various ways, in the particular construction illustrated, there are provided two carriages 10, these carriages moving on tracks 11 secured to crossbars 12, 13, these cross-bars connecting the side frames. These carriages support the shafts 8, 9 and may also be provided with brackets 14 carrying bearings 15 which receive the shafts on which arms 16 are mounted, these arms serving to support the propeller rolls 4. The adjusting movement of the carriages may be secured in any desired way. In the construction shown, each carriage (see Fig. 3) is provided with a depending rib 17 which carries a bearing 18, this bearing receiving a horizontal shaft 19. This shaft 19 is threaded for a portion of its length, as shown in Fig. 5, this threaded portion passing through a tapped opening in the corresponding side frame 1, and be-

ing provided with a hand-wheel, as 20, or any other suitable means, for turning the shaft. The carriages 10 may also have secured to them plates 21, 22 (the plates 22 being shown in dotted lines in Fig. 1) which serve as guides for the incoming sheet.

The gripper mechanisms employed may be varied widely in construction. In the particular construction shown, each gripper mechanism includes a block 23 provided with a horizontal flange 24 by which the gripper mechanism is connected to the chain carrier, this flange, in the particular construction shown, forming one of the top links of the carrier. The block is also provided with an extension 25 the under face of which forms the upper or that jaw of the gripper with which the movable jaw coöperates. The movable jaw consists of an L-shaped piece, the vertical part of this L-shaped piece being marked 26 and the horizontal part 27, the part 27 being provided with an extension 28 which coöperates with the under face of the extension 25, the sheet being held between the flat surfaces of these extensions. The vertical part 26 of this L-shaped piece lies behind the extension 25 and between it and a rib 29 formed on the block. Between the body portion of the block 23 and the extension 25 there is provided a groove, and in this groove there is located a sliding plate 30, this plate being provided with a rib or forward extension 31. By this construction the shank 26 of the movable part is guided in its movement by the rear face of the extension 25, the rib 29 and the plate 30.

The means for operating the gripper jaws may be widely varied and will be varied according to the particular type of gripper mechanism employed. In the construction shown there is provided a rock-shaft 32 (see dotted lines in Figs. 4 and 5) journaled in the block 23. This shaft is provided with an operating arm 33 having an angular extension 34 which carries a roll 35. This shaft has segment teeth 36 formed on it, these teeth meshing with teeth 37 formed on the shank 26 of the movable gripper jaw. It is obvious that by rocking the shaft the movable gripper jaw will be raised and lowered, that is, the grippers will be opened and closed. The means for actuating the shaft to open the grippers which are provided in the particular construction shown, comprise cams 38 adjustable on rods 39 mounted on the carriages 10. By making these cams 38 adjustable, the time of opening the grippers, and consequently, the time of releasing the sheet, may be varied. This is important where sheets of different lengths are to be operated upon.

In the best constructions embodying the invention a lock will be provided which

after the grippers are opened to discharge the sheet, retains them in open position until they again reach the sheet taking point. While the construction of this lock, when employed, may be varied, in the particular construction illustrated, it comprises a plate 40 loose on the shaft 32, being held in position by a screw 41 tapped into the end of the shaft. This plate 40 has a locking extension 43 which coöperates with a rib 44 on the sliding plate 30. This sliding plate is provided with rack teeth 45 which engage the segment teeth 36, and has connected to its forwardly extending rib 31 a spring 46 extending into a boss in the extension 23, and being secured therein by a plug screw 47. A leaf spring, as 48, may be employed which bears on an angularly disposed inwardly extending finger 49 formed on the plate 40. The plate 40 is extended behind its pivot point to form an operating arm 50, this arm carrying a roll 51. When the shaft 32 is rocked to open the grippers, the engagement of the teeth 36 with the teeth 45 on the plate 30 will cause this plate to move to the right, as the parts are shown in Fig. 5, and the locking extension 43 will engage behind the rib 44, the plate being thrown down by the leaf spring 48. This movement of the plate also places the spring 46 under tension. The gripper mechanism is now locked in its opened position, and will remain so until the plate 40 is rocked in the opposite direction which will lift the locking extension 43 from behind the rib 44. When this occurs the spring 46 will slide the plate 30 in the opposite direction, that is to the left, and this movement will rock the shaft 32 through the engagement of the teeth 45 and the teeth 36. Since, however, the teeth 36 are also in engagement with the teeth 37 on the vertical shank of the movable gripper, this shank will be carried upward, thus closing the gripper.

The means employed in the particular construction shown for rocking the locking plate to unlock the grippers comprise cams 52 formed on the under side of cam plates 53, these plates being carried on brackets 54 fast on the carriages 10, these cams 52 being so arranged that the rolls 51 contact with them at about the time when the grippers are to be opened.

To provide for an easy closing of the grippers and to prevent shock which is liable to occur in a rapidly operating construction a second cam, as 55, may be employed, this cam being so arranged that the roll 35 on the shaft 32 strikes it at about the time the unlocking cams operate. Although, therefore, the lock is released, the grippers cannot close until the roll 35 runs out from under this cam 55. This construction, therefore, provides for an easy closing of the

grippers, as the cam 55 will be given such a contour as to effect this.

In the best constructions embodying the invention means will be provided for sustaining the gripper carriers against the strains developed by the operation of the gripper actuating devices, and these means may well include mechanism for not only sustaining the thrust produced but also for taking up any twisting or torsional strains. While these sustaining means may effect one or both of these functions, and may be varied in construction, as shown, the chains 5 have secured to them angle brackets 56 which carry rolls 57, there being a pair of these rolls 57 for each gripper mechanism. These rolls 57 bear on horizontal plates which form part of the carriage construction 10 and thus take care of the downward thrust produced in the gripper opening operation. The torsional strains are, in the particular construction illustrated, taken care of by guides 58, 59 between which the chains run. These guides also have the important function of preventing any whipping of the chains between the sprockets. If desired, and as shown, the guides 58, 59 may be adjustably secured to the carriage plates. This may be effected by causing the securing bolts 60 for the guides 59 to pass through slots 61 in the carriage plate, and by providing the brackets 62 with slots 63 through which the securing bolts 64 for these brackets pass. This adjustment of the guides renders it possible to so control the chains as to cause the gripper mechanisms to approach each other slightly and thus slacken the tension of the sheet so that it may bag or belly downward slightly at its center. As the sheet is delivered the bagging portion strikes the pile first and the air is thus forced out from under the sheet with the result that the sheets will lie flat when delivered at high speed.

Changes and variations may be made in the construction by which the invention claimed is carried into effect. The invention claimed is not, therefore, to be confined to the particular construction hereinbefore described and illustrated in the accompanying drawings.

What is claimed is:—

1. In a sheet delivery mechanism, the combination with a pair of traveling flexible gripper carriers one on each side of the sheet path, of actuating wheels for the carrier rotating on axes which are normal to the plane of the sheet path, grippers mounted on the carriers, and gripper actuating devices overlying the inner runs of the carriers.

2. In a sheet delivery mechanism, the combination with a pair of traveling flexible gripper carriers one on each side of the sheet path, of actuating wheels for the carriers

rotating on axes which are normal to the plane of the sheet path, adjustable guides for the carriers, grippers on the carriers, and gripper actuating devices overlying the inner runs of the carriers.

3. In a sheet delivery mechanism, the combination with a pair of carriages one on each side of the sheet path, of means for adjusting the carriages toward and away from said path, a pair of traveling flexible gripper carriers one on each carriage, actuating wheels for the carriers mounted on the carriages, said wheels rotating on axes which are normal to the plane of the sheet path, grippers mounted on the carriers, and gripper actuating devices mounted on the carriages and located over the inner runs of the flexible carriers.

4. In a sheet delivery mechanism, the combination with a pair of carriages one on each side of the sheet path, of means for adjusting the carriages toward and away from the sheet path, a pair of traveling flexible gripper carriers one on each carriage, actuating wheels for the carriers mounted on the carriages, said wheels rotating on axes which are normal to the plane of the sheet path, adjustable guides for the carriers, grippers on the carriers, and gripper actuating devices overlying the inner runs of the carriers.

5. In a sheet delivery mechanism, the combination with a pair of flexible gripper carriers, one on each side of the sheet path, of means for causing said carriers to travel in a plane which is parallel to the plane of the sheet path, grippers mounted on the carriers, gripper actuating devices overlying the inner runs of the carriers, and means for supporting the carriers at the gripper actuating points.

6. In a sheet delivery mechanism, the combination with a pair of flexible gripper carriers one on each side of the sheet path, of means for causing said carriers to travel in a plane which is parallel to the plane of the sheet path, grippers mounted on the carriers, gripper actuating devices located at the sheet taking and delivery points, and a lock for holding the grippers open between the sheet delivery and the sheet taking points.

7. In a sheet delivery mechanism, the combination with a pair of flexible gripper carriers one on each side of the sheet path, of means for causing said carriers to travel in a plane which is parallel to the plane of the sheet path, grippers mounted on the carrier, gripper actuating devices located at the sheet taking points, adjustable gripper actuating devices located at the sheet delivery point, and a lock for holding the grippers open between the sheet delivery and the sheet taking point.

8. In a sheet delivery mechanism, the combination with a pair of flexible gripper carriers one on each side of the sheet path, of means for causing said carriers to travel in a plane parallel to the plane of the sheet path, gripper mechanisms including movable jaws, and means for giving said jaws a right line movement to open and close the grippers.
9. In a sheet delivery mechanism, the combination with a pair of flexible gripper carriers one on each side of the sheet path, of means for causing said carriers to travel in a plane parallel to the plane of the sheet path, gripper mechanisms including movable jaws, and gripper actuating devices located at the sheet taking and delivery points.
10. In a sheet delivery mechanism, the combination with a pair of flexible gripper carriers one on each side of the sheet path, of means for causing said carriers to travel in a plane parallel to the plane of the sheet path, gripper mechanisms including movable jaws, gripper actuating devices located at the sheet taking and delivery points, and a lock for holding the grippers open between the sheet delivery and the sheet taking points.
11. In a sheet delivery mechanism, the combination with a pair of flexible gripper carriers one on each side of the sheet path, of means for causing said gripper carriers to travel in a plane parallel to the plane of the sheet path, gripper mechanisms mounted on the carriers, each of said mechanisms including a movable jaw, gripper actuating devices located at the sheet taking and sheet delivery points, and means for supporting the carriers as said devices come into operation.
12. In a sheet delivery mechanism, the combination with a pair of flexible gripper carriers one on each side of the sheet path, of means for causing said gripper carriers to travel in a plane parallel to the plane of the sheet path, gripper mechanisms mounted on the carriers, each of said mechanisms including a movable jaw, and means for operating said jaws to open and close the grippers.
13. In a sheet delivery mechanism, the combination with a pair of flexible gripper carriers one on each side of the sheet path, of means for causing said gripper carriers to travel in a plane parallel to the plane of the sheet path, gripper mechanisms mounted on the carriers, each of said mechanisms including a movable jaw, gripper actuating devices located at the sheet taking and delivery points, supporting rolls on the carriers in juxtaposition to the gripper mechanisms, and supporting means with which the rolls cooperate.
14. In a sheet delivery mechanism, the combination with a pair of gripper carrying chains, one on each side of the sheet path, of means for causing the chains to travel in a plane parallel to the plane of the sheet path, gripper mechanisms mounted on the chains, gripper actuating devices, guides for sustaining the chains against torsional movement as the gripper actuating devices come into operation, and means for supporting the chains against the thrust of the gripper actuating devices.
15. In a sheet delivery mechanism, the combination with a pair of flexible chains one on each side of the sheet path, of means for causing said chains to travel in a plane parallel to the plane of the sheet path, gripper mechanisms mounted on the chains, each of said mechanisms including a movable jaw, and means for giving said jaws a right line movement to open and close the grippers.
16. In a sheet delivery mechanism, the combination with a pair of flexible chains one on each side of the sheet path, of means for causing said chains to travel in a plane parallel to the plane of the sheet path, gripper mechanisms mounted on the chains, each of said mechanisms including a movable jaw, gripper actuating devices located at the sheet taking and delivery points, and means for sustaining the chains against the strains produced by the operation of the gripper actuating devices.
17. In a sheet delivery mechanism, the combination with a pair of flexible gripper carriers one on each side of the sheet path, of means for causing the carriers to travel in a plane parallel to the plane of the sheet path, gripper mechanism mounted on each carrier each of said mechanisms including a movable jaw, a rock-shaft and suitable connections for giving said jaws a right line movement to open the grippers, and a spring and suitable connections for closing the same.
18. In a sheet delivery mechanism, the combination with a pair of flexible gripper carriers one on each side of the sheet path, of means for causing the carriers to travel in a plane parallel to the plane of the sheet path, gripper mechanism mounted on each carrier each of said mechanisms including a movable jaw, gripper actuating devices located at the sheet taking and sheet delivery points, and means for sustaining the carrier against the strains developed by the operation of the actuating devices.
19. In a sheet delivery mechanism, the combination with a pair of flexible gripper carriers one on each side of the sheet path, of means for causing the carriers to travel in a plane parallel to the plane of the sheet path, gripper mechanisms mounted on each carrier each of said mechanisms including a movable jaw, gripper actuating devices

located at the sheet taking and sheet delivery points, means for sustaining the carrier against the strains developed by the operation of the actuating devices, and a lock
5 for holding the grippers open between the sheet delivery and sheet taking points.

In testimony whereof, I have hereunto set

my hand, in the presence of two subscribing witnesses.

EDWARD P. SHELDON.

Witnesses:

RICHARD KELLY,
GEORGE R. CREIGHTON.