

(No Model.)

2 Sheets—Sheet 1.

D. McC. SMYTH.
SIGNATURE GATHERER.

No. 565,146.

Patented Aug. 4, 1896.

Fig. 1.

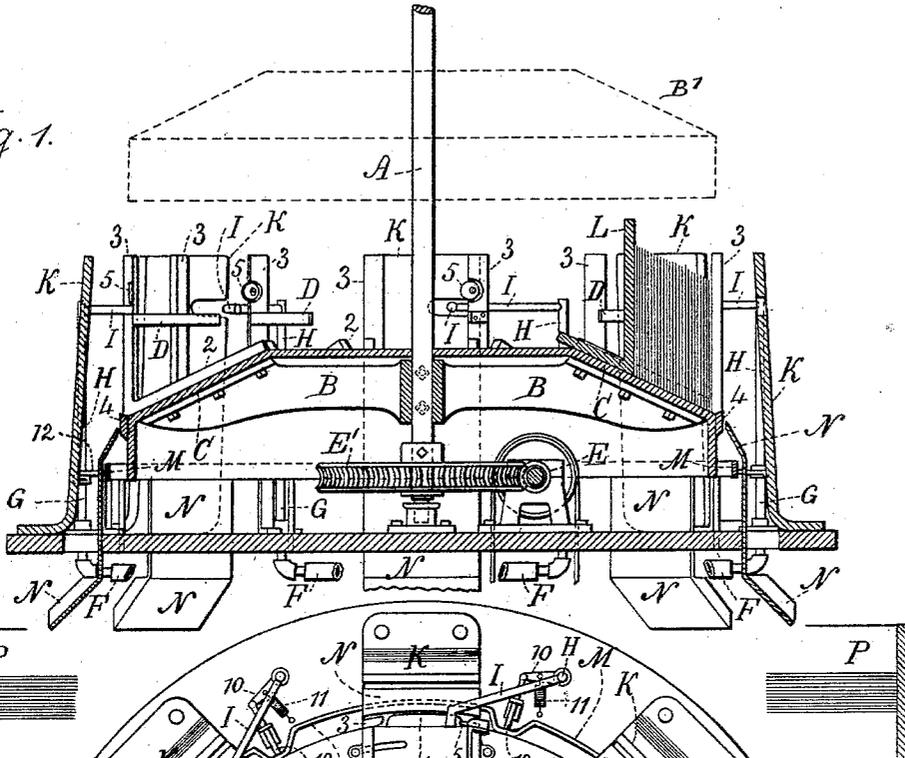
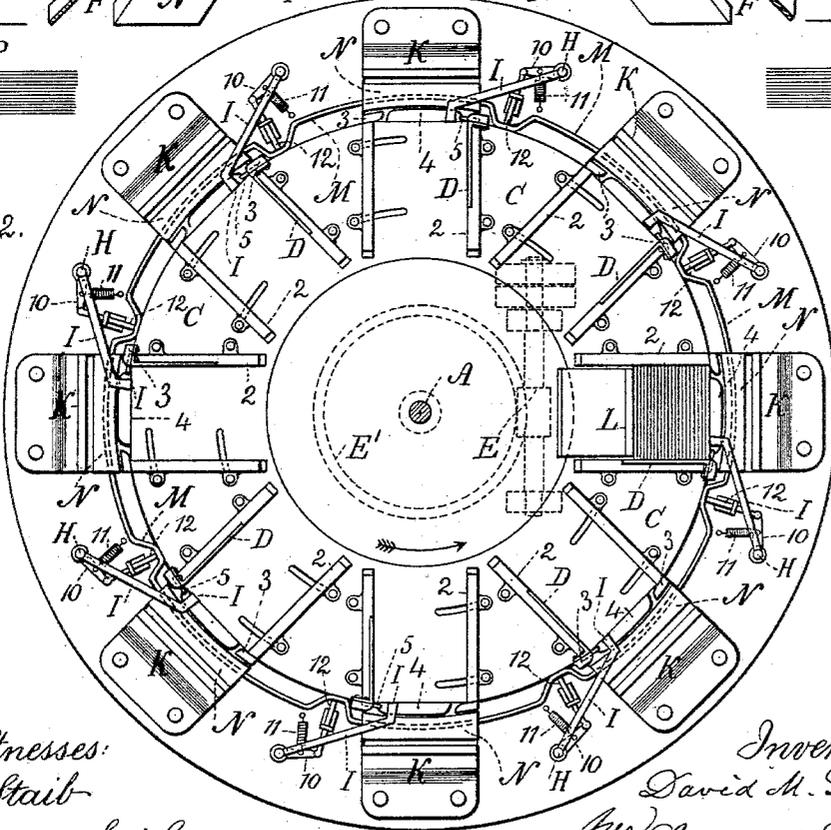


Fig. 2.



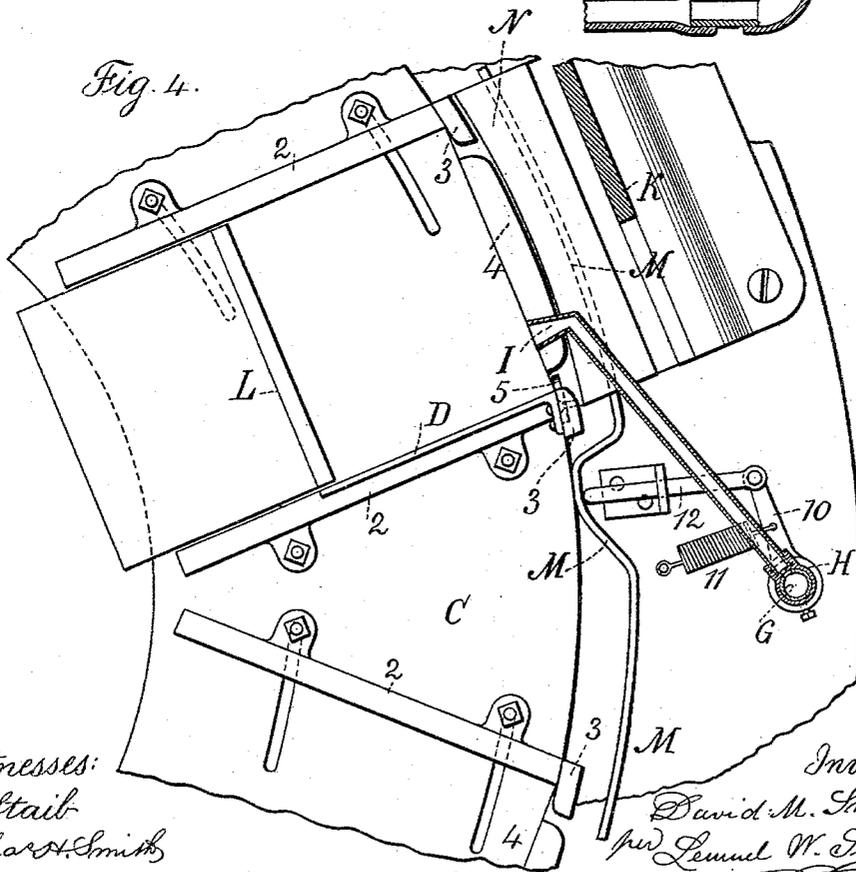
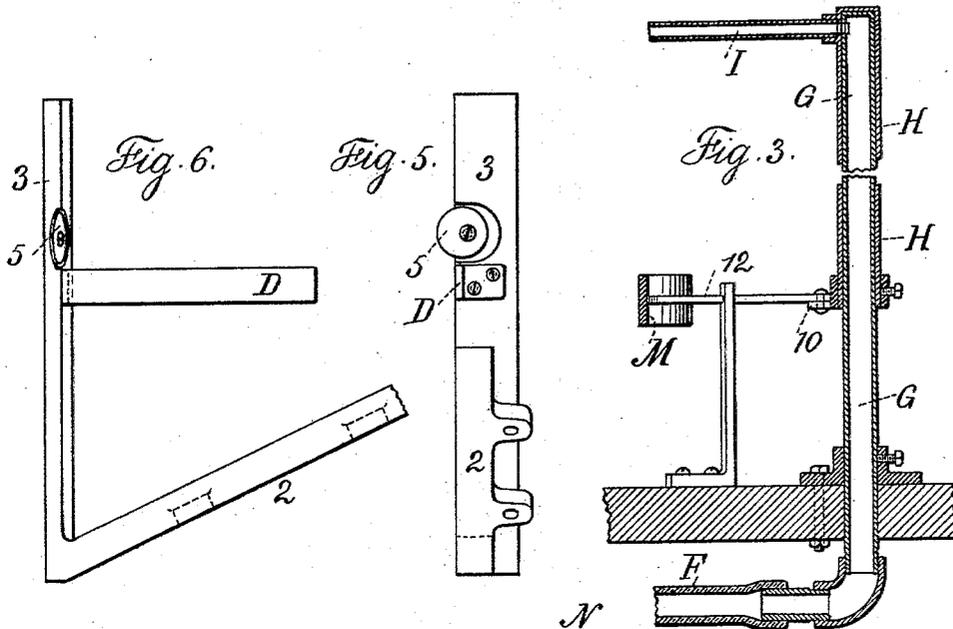
Witnesses:
J. Staib
Chas. H. Smith

Inventor:
David M. Smyth
per Lemuel W. Terrell

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Att.

UNITED STATES PATENT OFFICE.

DAVID McCONNELL SMYTH, OF PASADENA, CALIFORNIA.

SIGNATURE-GATHERER.

SPECIFICATION forming part of Letters Patent No. 565,146, dated August 4, 1896.

Application filed October 22, 1894. Renewed December 28, 1895. Serial No. 573,680. (No model.)

To all whom it may concern:

Be it known that I, DAVID McCONNELL SMYTH, a citizen of the United States, residing at Pasadena, in the county of Los Angeles and State of California, have invented an Improvement in Machines for Gathering Signatures, of which the following is a specification.

In this machine the signatures are placed in piles upon a progressively-rotated table having an inclined edge, down which the signatures slide and are arrested by posts or stops, and a sucker actuated in unison with the movement of the table is brought against the outer sheet in each pile of sheets successively, and by the exhaustion of the air the sheet is grasped by the sucker and moved bodily away against the stripper that arrests the sheet as the vacuum is cut off, and the sucker draws back, liberating the sheet, which falls and is turned into a horizontal position into a vertical receiver or holder, so that the signatures are piled successively in regular order one upon the other.

In the drawings, Figure 1 is a vertical section of the revolving table and other parts. Fig. 2 is a plan view. Fig. 3 is a section, in larger size, showing the sucker and the parts acting with it. Fig. 4 is a plan view of one edge of the table. Fig. 5 is an elevation at the rear of the supporting-posts, showing the adjustable gage; and Fig. 6 is a side elevation of the same.

The machine is made with any suitable bed-plate or frame, and the central shaft A is provided with a hub and arms B, extending to the inclined rim or table C, which is divided up into any desired number of sections or receivers for the signatures. The numbers, of course, may vary according to the number of signatures in the book, and each receptacle or holder is to be of the proper width for receiving the folded sheet or signature, which preferably rests upon the folded top edges, the folded back edges of the signatures advantageously coming to the left, and the circular table is to be rotated progressively by any suitable mechanism, such, for instance, as a screw-pinion E, acting upon a wheel E' upon the shaft A of the table, or the table may be moved intermittently the necessary space for

each signature by the action of a ratchet and pawl or other device.

Around the rim of the table vertical stops or posts 3 are fastened at proper distances apart, so that the back edge of the folded sheet will rest against one post and the opposite or loose edges of the signature will rest against the next post, and it is advantageous to apply radial guide-bars 2 upon the inclined rim of the feed-table and parallel to the radius, between which bars the signatures are received, and a follower L is adapted to slide downwardly by gravity between these guide-bars 2 and sustain the pile of signatures in position, as well as cause them to move down the inclined rim of the table as the signatures are removed successively, as hereinafter described, and it is also advantageous to employ sheet-guides D, attached to the vertical stop-posts 3 and projecting inwardly, so that the folded back edges of the signatures rest against these radial sheet-guides. These posts, or one post in each pair, can be connected to the table by slots and screws, so as to be adjusted to accommodate different sizes of signatures.

If the parts before described only were made use of, the signature might drop off the edge of the inclined rim of the table. To prevent this, holding-lips 4 are provided which extend out horizontally or nearly so at the bottom or edges of the inclined sheet-holding table, so that the lower signature in each pile may be held up by such lip 4.

Upon the inner side of each vertical stop-post a variable stop 5 is provided let into the post so that the surface of the stop coincides with the inner or back surface of the post, and it is advantageous to make these stops eccentric and secured by a screw, so that by loosening the screw the eccentric-stop can be partially rotated, so that its edge will project a greater or less distance, as required, beyond the edge of the vertical stop-post, so as to become a holder for the folded back edge of the lower signature.

It will now be understood that the signatures are to be placed in piles in their regular order upon the inclined rim of the table, and that this table is to be revolved progressively and a sheet taken out from each holder

or box in succession by the means hereinafter described, so as to gather the signatures in regular order.

A tube F, which is preferably flexible, is connected to any suitable exhaust or suction apparatus, so that a vacuum or partial vacuum is maintained in such tube, and this tube is connected with a standing tube G, supported by the bed of the machine, and upon the tube G is a tubular sleeve H, having an arm 10 and spring 11, by which the sleeve H is turned, so that its tubular sucker I is swung toward the signature in the pile of signatures, and it is advantageous to make in the tube G and in the sleeve H adjacent to the sucker-arm I openings that act as valves, so that when the sucker I is moved against the signature in the pile of signatures the valve opens for the exhaust or suction to take place, and as the sucker is swung back and the sleeve H partially rotated the suction or vacuum is shut off.

To give the movement to the sleeve H and sucker, any desired mechanism may be employed. I, however, have represented cams M around the rim of the table acting upon a pusher-bar 12, extending to the arm 10, and these cams are properly shaped, so that the required movement is given to the sleeve and sucker-arm and at the right time, so that the sucker-arm comes up against the outer surface of the lower signature in the pile of signatures and grasps the same by the sucking action, and the sucker immediately moves back, drawing with it the signature, so as to pull the folded edge thereof out from behind the eccentric 5 and draw the lower folded edge of the signature off the holding-lip 4, and the movement of the table liberates the loose edges of the folded signature from behind the receding vertical stop-post 3, and the signature is carried away bodily from the circular and revolving table.

By cutting off the exhaust the sheet is liberated from the sucker; but to insure this operation and to make the action more rapid I employ a stripper K in the form of a vertical plate, against which the folded signature is moved by the action of the sucker, such stripper being notched or provided with an opening for the passage of the sucker, and the signature is held by the stripper while the sucker draws entirely away, so that the sheet falls vertically and adjacent to the stripper K, and there is a deflector N, with its inclined upper edge closely adjacent to the rim of the table and behind which the cams M pass, and the lower end of this deflector is inclined outwardly, so that as the bottom end of the folded signature falls upon such deflector it is moved outwardly and the signature falls into a box or receptacle P, that is of a size corresponding to such folded signature, and by the repetition of the operations before described the signatures are removed in succession from the holders upon the revolving table and delivered so as to lie flat one upon the other within the box P and in

their regular order, and these folded and gathered signatures can be removed by hand or otherwise from the receptacle, the same being preferably taken out from the bottom of the receptacle in volumes or packages.

It is to be understood that in large books one of these gathering-machines can be employed for associating together the signatures up to a certain number representing the capacity of the machine, and that the balance of the signatures of the volume or book can be gathered in another machine and the two groups or packages of signatures brought together in forming the volume.

The followers L may be acted upon by springs to move such followers and the signatures toward the vertical stop-post 3, if desired, and where such springs are made use of the circular table may be level instead of inclined for the reception of the signatures.

In one machine there may be one table and its various appliances on the shaft A may be extended upwardly and receive upon it a second table, or there may be a number of such tables. I have indicated the position of a second table at B'.

When the second table is used, it is only necessary to extend the tubes G and H and provide a second arm or sucker I for the upper table, and the stripper K answers for two or more tables when simply elongated upwardly, because the signatures in falling will be one above the other and will slide down the deflector N one after the other.

I claim as my invention—

1. The combination in a machine for gathering signatures, of a table and means for revolving the same, a circular range of receptacles on such table for receiving the signatures and holding the same substantially vertical, a sucker and means for moving the same substantially horizontally and drawing the end signature laterally from the pile of signatures, and a deflector near the edge of the table and on which the signature is dropped from the sucker and by which deflector the signature is guided as it falls by gravity upon the previous signature, substantially as specified.

2. The combination in a machine for gathering signatures, of a table, means for revolving the same, a circular range of receptacles on such table each having a sheet-guide against which the folded back edges of the signatures rest, and a stop to come outside the said back edge as the signatures stand substantially vertical, a sucker and means for moving the same substantially horizontally and drawing the end signature laterally from the pile of signatures, a stripper for stripping the signature from the sucker and a receptacle into which the signatures are dropped successively, substantially as set forth.

3. The combination in a machine for gathering signatures, of a table, means for revolving the same, a circular range of receptacles on such table each having a sheet-guide

against which the folded back edges of the signatures rest, and a stop to come outside the said back edge as the signatures stand substantially vertical, a sucker and means for moving the same substantially horizontally and drawing the end signature laterally from the pile of signatures, a stripper for stripping the signature from the sucker and a receptacle into which the signatures are dropped successively, a deflector near the edge of the table for guiding the signatures into the receptacle, substantially as set forth.

4. The combination in a machine for gathering signatures, of a table, means for revolving the same, a circular range of receptacles each receptacle having a sheet-guide against which the folded back edges of the signatures rest, an adjustable stop to lap more or less over the folded edge of the end signature for holding such signature in a substantially vertical position, a sucker and means for moving the same to draw the signature laterally and from behind the stop and a receptacle into which the signatures are delivered in succession, substantially as set forth.

5. The combination in a machine for gathering signatures, of a table, means for revolving the same, a circular range of receptacles each receptacle having a sheet-guide against which the folded back edges of the signatures rest, an adjustable stop to lap more or less over the folded edge of the end signature, and a lip at the edge of the table for holding such signature in a substantially vertical position, a sucker and means for moving the same to draw the signature laterally and from behind the stop and over the lip and a receptacle into which the signatures are delivered in succession, substantially as set forth.

6. In a machine for gathering signatures the combination with the mechanism for holding and presenting the piles of signatures in succession, of a sucker, a tubular sleeve from which the tubular sucker projects, a stationary tube upon which the sleeve is supported, a spring and cams for giving motion to the sleeve upon the tube, there being openings through the tube and sleeve respectively for allowing the vacuum to act in the sucker or to shut off the vacuum from the same as the sleeve is swung, substantially as set forth.

7. The combination in a machine for gathering signatures, of a table, means for revolving the same, a circular range of receptacles on such table for receiving and holding the

signatures substantially vertical, a sucker and means for moving the same substantially horizontally and for opening and closing the exhausting air-pipe whereby the end signature is drawn laterally from the pile of signatures, a deflector near the edge of the table on which the signatures are dropped in succession from the sucker and a receptacle into which the signatures are guided by the deflector as they fall by gravity, substantially as set forth.

8. The combination in a machine for gathering signatures, of a range of receptacles for receiving and holding piles of such signatures substantially vertical, means for moving the receptacles around progressively, a sucker and means for moving the same substantially horizontally and drawing the end signatures laterally from the piles of signatures and a deflector upon which the signatures are dropped in succession from the sucker and by which such signatures are guided as they fall by gravity, substantially as specified.

9. The combination in a machine for gathering signatures, of a range of receptacles for receiving and holding piles of such signatures substantially vertical, means for moving the receptacles around progressively, a sucker and means for moving the same substantially horizontally and drawing the end signatures laterally from the piles of signatures, a stripper for stripping the signatures from the suckers, and a deflector upon which the signatures are dropped in succession from the sucker and by which such signatures are guided as they fall by gravity, substantially as specified.

10. The combination in a machine for gathering signatures, of a range of receptacles, means for revolving the same around progressively, each receptacle having a sheet-guide against which the folded back edges of the signatures rest, a stop to come outside such signatures as they stand substantially vertical, a sucker and means for moving the same toward and from the signatures for drawing off the end signature laterally from the pile of signatures, a stripper for stripping the signature from the sucker, and a receptacle into which the signatures are dropped successively, substantially as set forth.

Signed by me this 20th day of September, 1894.

DAVID McCONNELL SMYTH.

Witnesses:

C. U. BUNNELL,
ANN E. DEAN.