

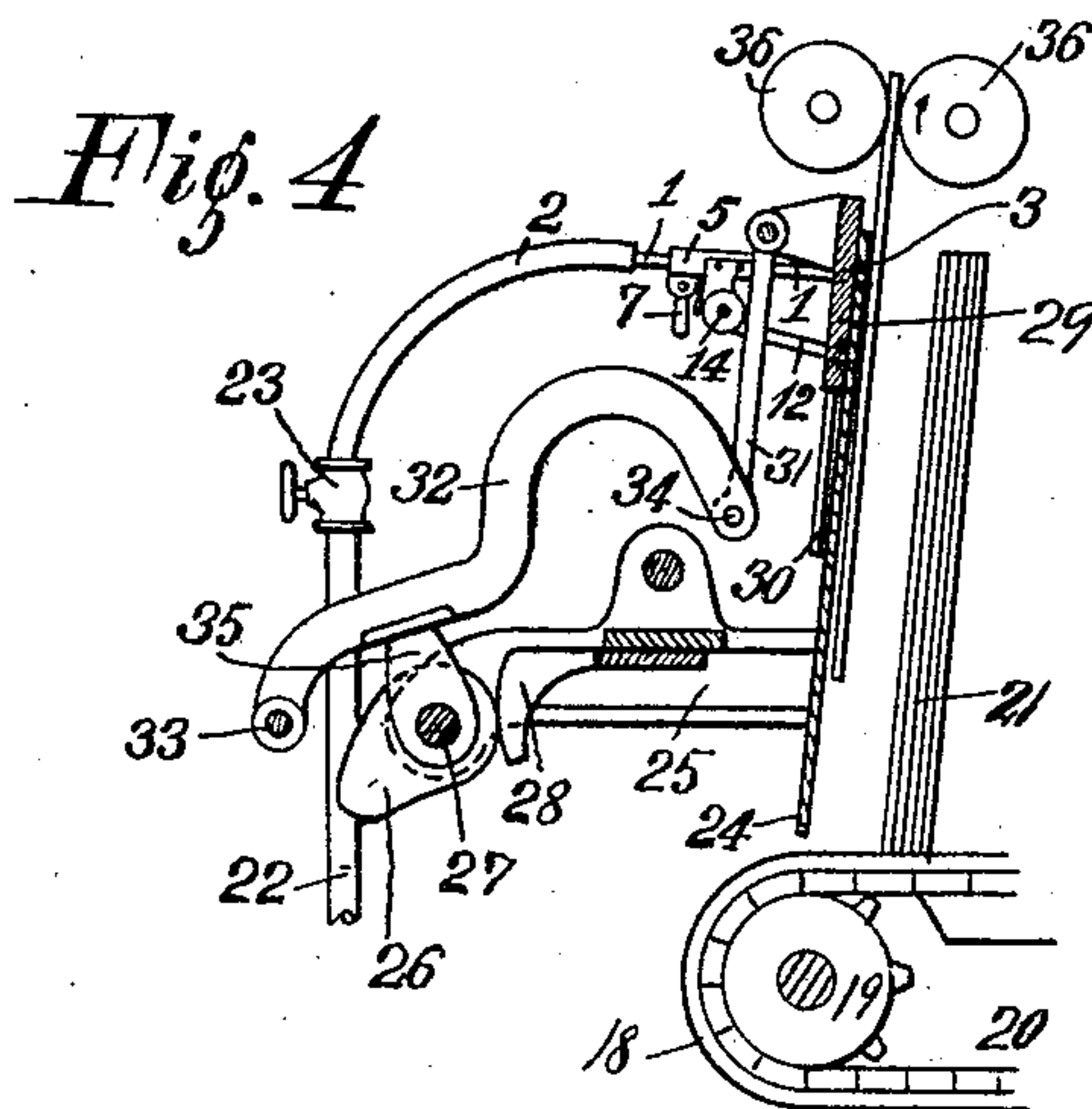
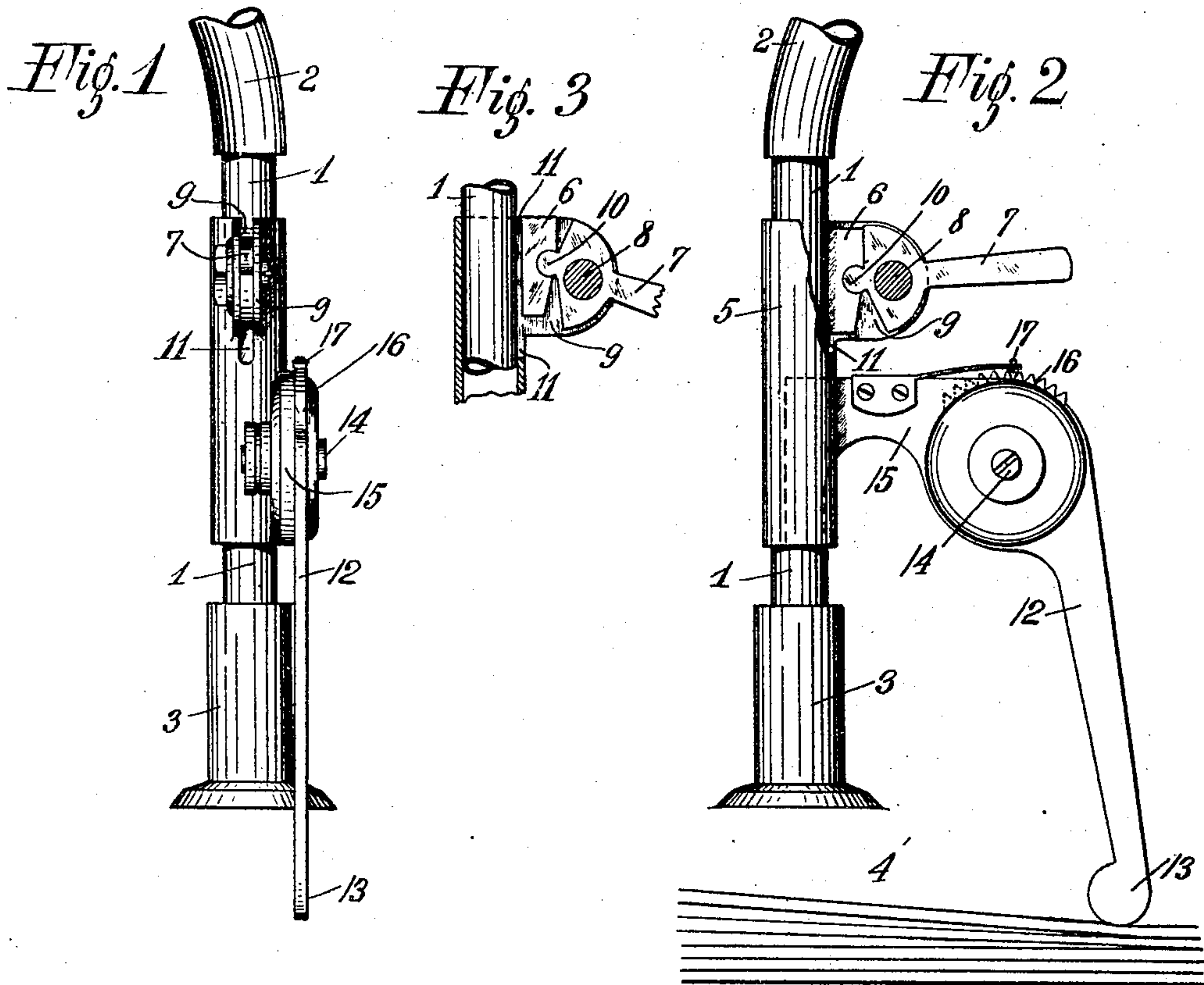
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PATENTED JULY 26, 1904.

B. KERSCHER.
SIGNATURE GATHERING MACHINE.

APPLICATION FILED JAN. 2, 1904.

NO MODEL.



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UNITED STATES PATENT OFFICE.

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SIGNATURE-GATHERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 765,738, dated July 26, 1904.

Application filed January 2, 1904. Serial No. 187,507. (No model.)

To all whom it may concern:

Be it known that I, BERNHARD KERSCHER, a citizen of the United States of America, and a resident of Brooklyn, Kings county, New York, have invented certain new and useful Improvements in Signature-Gathering Machines, of which the following is a specification.

My invention relates generally to signature-gathering machines, and refers more particularly to improvements therein, which will be more specifically set forth hereinafter.

A book or pamphlet is made up of a number of smaller booklets, which in turn are comprised of several folios or leaves. These "booklets" are called "signatures" in the art and are arranged in the book in a definite consecutive order. There are in use automatic machines which gather these signatures preparatory to binding them in book form. The means employed by these machines are various, and I wish to remark here that so far as I am aware my improvement can be applied to any of these machines. I do not wish, therefore, to be understood as limiting myself to the machine illustrated in the accompanying drawings or indeed to any particular machine. The different machines in use generally comprise troughs arranged consecutively and in each of which is placed a pile of signatures. A receiving table or belt moves past these troughs, above, below, or at the side, as the case may be, and means are provided for removing the signatures singly from the pile and depositing them on the receiving table or belt. The table or belt is then moved forward, so that on a particular signature already deposited can be placed a signature from the next pile ahead, and so on until a stack of signatures is formed with one signature from each of the several piles in proper order for binding into book or pamphlet form. The means usually provided for removing the signatures one at a time is an atmospheric exhaust or sucker, which is brought at the proper time into contact with the signature, the exhaust operated and the sucker brought into a position where it delivers the signatures to the receiving table or belt. The force of the exhaust is constant in the suckers, acting on

all piles, and therefore in case the signatures in one pile are of lighter weight the force of the exhaust is sufficient to draw away more than one signature. Again, if it be desired to insert between signatures a single sheet—as, for instance, a print and a protecting sheet of tissue-paper—the force of the exhaust frequently draws away more than one from the pile. This difficulty is not confined to piles of signatures or sheets varying in weight from others; but often more than one signature is drawn away in cases where the weight of signatures in all piles is alike.

The object of my invention, therefore, is to provide means cheap in construction, efficient in operation, and easily adjusted which shall separate each signature from the pile without removing or disturbing any of the remaining signatures.

The accompanying drawings illustrate my invention in a preferred form, although changes may of course be made within scope of the claims.

In the drawings like characters of reference indicate like parts in the several views.

Figure 1 is an end elevation showing my invention applied to a sucker. Fig. 2 is a side elevation, parts being broken away. Fig. 3 is a detail view with parts broken away. Fig. 4 is a partial view in section of a gathering-machine, showing the manner of removing a signature and employing my invention.

As already intimated, my invention relates, broadly, to means for separating the signatures, and I employ for this purpose a member attached to the suckers and acting as a stop for its movement toward the pile of signatures. This member serves also to raise the outer signature or a portion thereof to meet the sucker in the fashion shown in Fig. 2, thereby lessening the force of the suction on the remaining signatures. This member is laterally adjustable and is adjustably attached to the sucker, so that its action can be made to conform to the varying weights of signatures.

Referring now more in detail, Figs. 1, 2, and 3 show a sucker comprised of tube 1, attached to flexible connection 2, leading to the exhaust-cylinder, and flexible nipple 3, preferably of rubber and cup-shaped to fit snugly

on the signature 4. Sliding over the tube is a slotted sleeve 5. This is adjustable on the tube by any suitable means, preferably by a wedge 6, operated by lever 7. The lever is here shown pivoted at 8 to ears 9, depending from the sleeve, and operates the wedge through the eccentric 10, the wedge contacting with the tube through slot 11.

The means which I employ for limiting the movement of the sucker toward the pile of signatures and for raising one of the latter is here shown as a member 12, having a circular portion 13 where it contacts with the signature. This member is carried in some suitable manner by the sleeve. In the present instance it is pivoted at 14 to a hanger-plate 15, attached to the sleeve. A portion of the stop is enlarged where it is pivoted to the plate. Teeth 16 are formed on the periphery of this enlarged portion and are adapted to engage with a spring-seated pawl 17, suitably attached to the hanger-plate. This spring-seated pawl and teeth serve to retain the member 12 in position.

It will be understood by referring to Fig. 2 that the sucker as it moves toward the pile of signatures carries with it the sleeve and the member 12. The portion 13 of this member is carried in advance of the sucker and on striking the pile of signatures crinkles a portion of the outer signature, raising it from the pile in the manner indicated. The part 12 when extending below the level of the bottom of the sucker 3 will of course prevent it from coming into contact with the pile of signatures, the spring of the dog 17 being strong enough to overcome any rotary tendency of the member 12 caused by its impact on the face of the pile of signatures. This impact of the member 12 causes some separation of the top signature from the signatures beneath by reason of its clamping action on the pile, so that the top signature is better positioned for being drawn against the mouth of the sucker by the pneumatic action. When the sucker acts, it is obvious that its force cannot effect the remaining signatures, as it would if the outer signature had been left at rest on the pile. The member is adjusted according to the weight of signatures in the particular pile. If heavier, it is moved farther away from the sucker and fixed in position by the teeth and spring-pawl and is raised by moving the sleeve. If the signatures or sheets be very thin, then the member is brought in close to the sucker and lowered by moving the sleeve. The result of the latter operation is to produce a more pronounced kink in the signature, throwing it up higher, and thereby lessening the likelihood of the suction acting upon the remaining signatures.

I will now explain briefly the general working of a signature-gathering machine in so far as it is necessary to an understanding of the use of my invention.

Referring to Fig. 4, 18 represents a feed-apron for forwarding the pile of signatures

in the trough. 19 is a sprocket-wheel, around which passes the drawing-chain 20, carrying the feed-apron. 21 is a pile of signatures carried by the apron in the trough. The flexible connection 2 joins the sucker 1 to a pipe 22, leading to the suction-chamber, with a globe-valve 23 interposed therein. 24 represents a plate carrying the suckers necessary for removing the signatures and secured to a carrier 25. This plate is moved toward and away from the signatures by the cam 26, operating on shaft 27 and moving the lug 28 on the front side of the carrier.

The suckers are mounted on a carriage 29, sliding up and down in the guide 30 on the plate 24. Link 31 connects the sucker-carrier with the lever 32, swinging vertically on the pivot 33. The end of the lever connecting with the link is pivoted at 34. 35 is a cam mounted on shaft 27 and engaging with the under side of the lever 32. As this cam rotates its salient part raises the lever 32 and the suckers connected therewith, and when the salient part clears the lever the latter drops by gravity with the suckers. The suckers after removing a signature are moved toward the rollers 36, which receive the signature and on the sucker being released deposit it on a gathering-apron moving intermittently, as previously described, by any suitable means.

While the plate 24 is in its forward position the suckers are in the lowermost position in guide 30 and the pile is moved forward one space by the feed-apron 18. The plate then moves backward, carrying the suckers in the lower position toward the pile. The member 12 first strikes the pile, raising or crinkling a portion of the foremost signature, so that the sucker, which is then operated, grips this signature, but does not affect the remaining signatures. On moving forward the plate carries away the signature, and at the end of this movement the suckers are raised by the action of cam 35 and connecting-levers and the signature is handed to the rollers 36, which in turn deposit it on the gathering-apron. The suckers then fall to the lowermost position in the guide 30 and the operation is repeated.

Having thus described my invention, what I claim is—

1. In a signature-gathering machine, a sucker, means adapted to move said sucker toward and away from the pile of signatures, a sleeve carried by said sucker, a member pivoted on said sleeve and adapted to raise a portion of one signature from the pile to meet the sucker and to separate the signature from the pile.

2. In a signature-gathering machine, a sucker, means adapted to move said sucker toward and away from the pile of signatures, an adjustable sleeve carried by said sucker, a member pivoted on said sleeve and adapted to

raise a portion of one signature from the pile to meet the sucker and to separate the signature from the pile.

3. In a signature-gathering machine, a sucker, means adapted to move said sucker toward and away from the pile of signatures, a sleeve carried by said sucker, a member adjustably pivoted on said sleeve and adapted to raise a portion of one signature from the pile to meet the sucker and to separate the signature from the pile.

4. In a signature-gathering machine, a sucker, means adapted to move said sucker toward and away from the pile of signatures, an adjustable sleeve carried by said sucker, a member adjustably pivoted on said sleeve and adapted to raise a portion of one signature from the pile to meet the sucker and to separate the signature from the pile.

5. In a signature-gathering machine, a sucker, means adapted to move said sucker toward and away from the pile of signatures, a sleeve carried by said sucker, a member pivoted on said sleeve, means adapted to retain said member in position, said member being adapted to raise a portion of one signature from the pile to meet the sucker and to separate the signature from said pile.

6. In a signature-gathering machine, a sucker, means adapted to move said sucker toward and away from the pile of signatures, an adjustable sleeve carried by said sucker, a member pivoted on said sleeve, means adapted to retain said member in position, said member being adapted to raise a portion of one signature from the pile to meet the sucker and to separate the signature from said pile.

7. In a signature-gathering machine, a sucker, means adapted to move said sucker toward and away from the pile of signatures, a sleeve carried by said sucker, a member adjustably pivoted on said sleeve, means adapted to retain said member in position, said member being adapted to raise a portion of one signature from the pile to meet the sucker and to separate the signature from said pile.

8. In a signature-gathering machine, a sucker, means adapted to move said sucker toward and away from the pile of signatures, an adjustable sleeve carried by said sucker, a member adjustably pivoted on said sleeve, means adapted to retain said member in position, said member being adapted to raise a portion of one signature from the pile to meet the sucker and to separate the signature from said pile.

9. In a signature-gathering machine, a

sucker, means adapted to move said sucker toward and away from the pile of signatures, a sleeve carried by said sucker, a member adjustably pivoted on said sleeve and having a portion toothed, a spring-seated pawl attached to said sleeve and adapted to engage with said teeth, said pawl and teeth being adapted to retain said member in position, said member being adapted to raise a portion of one signature from the pile to meet the sucker and to separate the signature from said pile.

10. In a signature-gathering machine, a sucker, means adapted to move said sucker toward and away from the pile of signatures, an adjustable sleeve carried by said sucker, a member adjustably pivoted on said sleeve, and having a portion toothed, a spring-seated pawl attached to said sleeve and adapted to engage with said teeth, said pawl and teeth being adapted to retain said member in position, said member being adapted to raise a portion of one signature from the pile to meet the sucker and to separate the signature from said pile.

11. In a signature-gathering machine, a sucker, means adapted to move said sucker toward and away from the pile of signatures, a sleeve carried by said sucker, means adapted to adjust said sleeve and sucker in relation to each other, a member adjustably pivoted on said sleeve, means adapted to retain said member in position, said member being adapted to raise a portion of one signature from the pile to meet the sucker and to separate the signature from the pile.

12. In a signature-gathering machine, a sucker, means adapted to move said sucker toward and away from the pile of signatures, a sleeve carried by said sucker and provided with a slot and ears, a wedge moving in said slot, a lever pivoted on said ears and adapted to operate said wedge to bind the sleeve and sucker, a member adjustably pivoted on said sleeve and having a portion toothed, a spring-seated pawl attached to said sleeve and adapted to engage with said teeth, said pawl and teeth being adapted to retain said member in position, said member being adapted to raise a portion of one signature from the pile to meet the sucker and to separate the signature from said pile.

Signed at Mount Vernon, New York, this 22d day of December, 1903.

BERNHARD KERSCHER.

Witnesses:

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