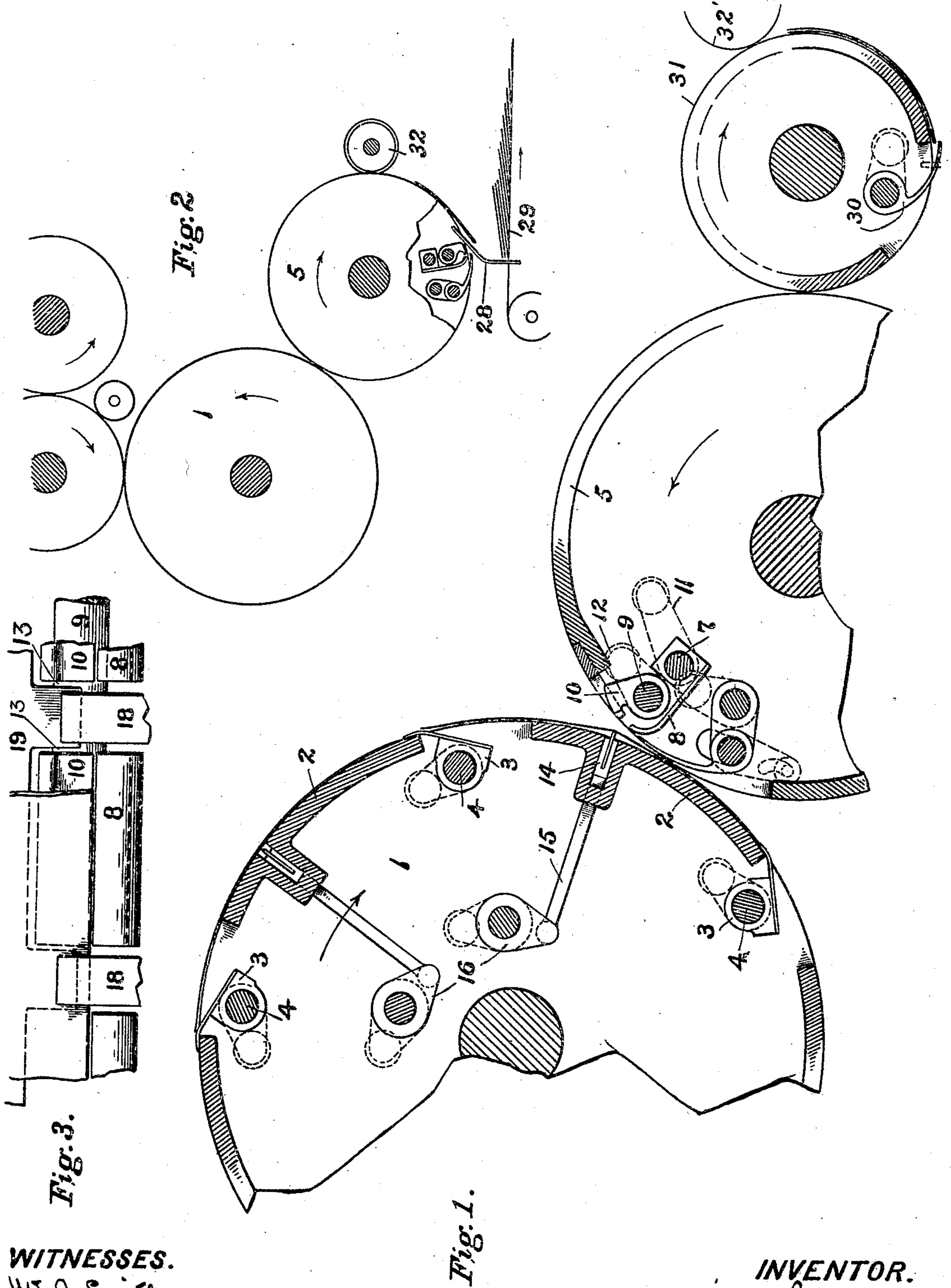


955,367.

W. SPALCKHAVER.  
SHEET FOLDING MECHANISM.  
APPLICATION FILED JULY 3, 1908.

Patented Apr. 19, 1910.

2 SHEETS—SHEET 1.



WITNESSES.  
W. A. Guile  
A. White

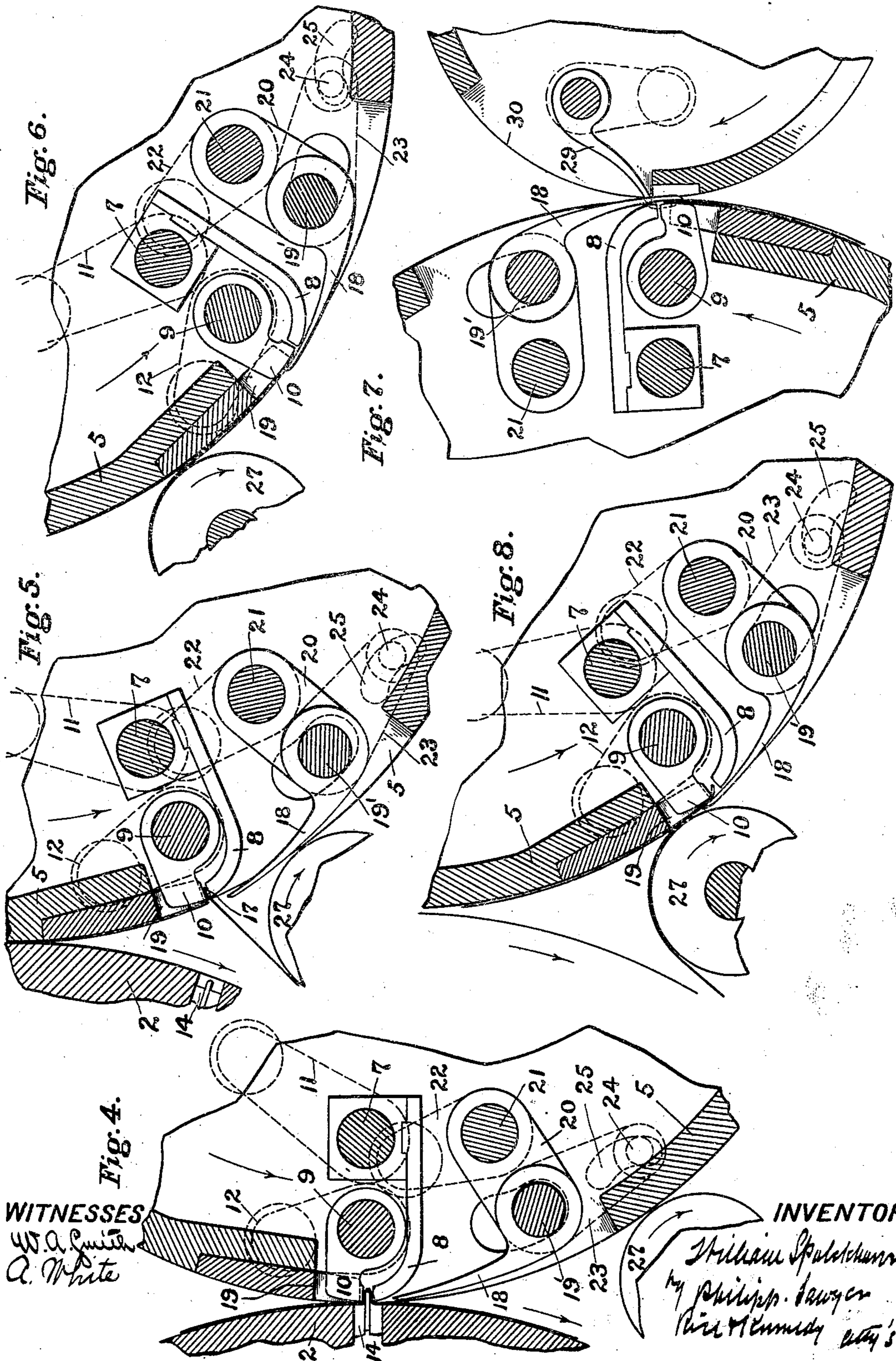
INVENTOR.  
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2 SHEETS—SHEET 2.



WITNESSES  
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# UNITED STATES PATENT OFFICE.

WILLIAM SPALCKHAVER, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS,  
TO R. HOE AND CO., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

## SHEET-FOLDING MECHANISM.

955,367.

Specification of Letters Patent.

Patented Apr. 19, 1910.

Application filed July 3, 1908. Serial No. 441,790.

*To all whom it may concern:*

Be it known that I, WILLIAM SPALCKHAVER, 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-Folding Mechanisms, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to certain improvements in sheet folding mechanisms and more particularly to that class of mechanisms in which the bight of a sheet is tucked into a set of nipping jaws. In folding deliveries of this character, the jaws are ordinarily mounted on a carrier, which is usually a rotary carrier, and the movement of the carrier after the sheet has been tucked into the jaws is such as to bend the body of the sheet away from the bight held by the nipping jaws, so that the bight or portion held by the nipping jaws lies at an angle to the rest of the sheet. When a sheet is bent in this way, that part of the sheet which lies at an angle to the body of the sheet tends to produce difficulties in the subsequent handling of the sheet. If, for instance, the sheet is to be slit while it is on the carrier, the slitter does not always cut through this bent portion of the sheet. The slitter has to be so constructed as to penetrate an unnecessary distance into the carrier and even when this is done, this bent part of the sheet not being properly supported, is frequently not properly cut by the slitter. Again, when a sheet bent in this manner is delivered, there is a tendency of the bent portion to be folded back under the body of the sheet where the sheet is to be taken from the nipping jaws by gripper fingers.

It is the object of this invention to produce a nipping jaw mechanism into which the bight of a sheet is tucked, the mechanism being so constructed that one of the nipping jaws may be given a movement with respect to the sheet to straighten its fold.

The invention further includes certain details of construction by which it is effectively carried out.

With these 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 drawings—Figure 1 is a sectional diagrammatic view illustrating one form of folding delivery mechanism embodying the invention. Fig. 2 is a view on a somewhat smaller scale illustrating another form of folding delivery mechanism embodying the invention. Fig. 3 is a detail plan view illustrating the nipping jaws and also a cooperating gripping mechanism which may be employed. Figs. 4 to 8 inclusive are diagrammatic views illustrating the operation of the improved mechanism.

Referring to the drawings which illustrate one embodiment of the invention, 1 indicates a sheet receiving and forwarding carrier which may be a collecting cylinder of the well-known multipart type. In the particular construction illustrated, this cylinder will have five sheet receiving surfaces, these surfaces being marked 2 and being supplied with suitable sheet holding devices, such as grippers 3, the grippers in the construction shown being mounted on rock-shafts 4 operated in the ordinary manner. Machines embodying the invention will include a carrier which receives the sheets from the carrier 1. This carrier may be of any suitable construction, but will usually be of the rotary type, that shown being a cylinder, marked 5. This cylinder will be provided with a pair of nipping jaws, the number of these jaws varying according to the mechanism by which the sheets are delivered to the carrier. In the construction illustrated, one set of nipping jaws only is illustrated, it being understood that if the carrier is provided with a plurality of sets of nipping jaws, these sets will be duplicates.

The particular construction of the jaws may be considerably varied. In the construction illustrated, there is provided a shaft 7 which may be suitably supported in the heads of the cylinder, this shaft carrying a nipping jaw 8. A second shaft 9 is also provided, this shaft carrying the companion nipping jaw 10. These shafts 7 and 9 will be operated in a well-understood manner by means of rock arms indicated at 11 and 12, which will cooperate

with cams, not shown. The jaw 10 will, in the best constructions, be recessed, as shown at 13 in Fig. 3, for reasons which will be hereinafter stated. The sheets will be tucked into the nipping jaws by any suitable tucking mechanism, that illustrated being the ordinary movable tucking blade 14 operated from push rods 15 connected with cam levers 16. This type of tucking blade is well-known in the art, and a specific description of it is unnecessary.

After the bight of the sheet has been tucked into the jaws 8, 10, the jaws are closed upon it, the closing movement being effected by proper configuration of the operating cams, or in any other suitable manner. When the jaws have nipped the sheet, it will be drawn off the carrier in a well-understood manner, that part of the sheet which is nipped by the jaws being bent at an angle to the body of the sheet, as is clearly shown, for instance, in Fig. 5, in which the portion held by the jaws is marked 17. In order to straighten out this bent portion, the jaws are caused, in the first place, to release it. To prevent any displacement of the sheet, means will, in the best constructions, be provided for holding the sheet when it is released by the jaws. While this means may be varied, in the particular construction illustrated, holding grippers are provided, there being one set of these grippers for each set of nipping jaws. As these grippers will be duplicates, only one set, marked 18, is illustrated. These grippers may cooperate with a suitable abutment, as 19, which projects into the recesses 13 in the jaw 10. These grippers 18 are, in the particular construction illustrated, mounted on a rock-shaft 19' which is in turn supported by arms 20 on a rock-shaft 21 which may be mounted in the heads of the cylinder. This shaft is provided with an operating arm 22 which cooperates with a suitable cam, not shown, such cams being common in this class of devices. Projecting from the shaft 19' is a controlling arm 23 having on it a pin 24 which works in a suitably formed cam slot 25 in the head of the cylinder. By this construction, the grippers are caused to move forward and close down upon the sheet, clamping the same against the abutment 19 before referred to. As the sheet is clamped, the jaws 8, 10 open to release the bight of the sheet, after which the jaw 10 is given a forward movement underneath the sheet, straightening out the bight of the same and at the same time ironing and sharpening the fold.

The sequence of operation is well illustrated in the diagrams Figs. 4 to 7 inclusive. In Fig. 4, the tucking blade 14 is shown as inserting the bight of the sheet between the gripper jaws 8, 10. In Fig. 5, the jaws have closed upon the sheet and the sheet has begun to be drawn from the carrier 2 by the

movement of the carrier 5, the outer ply of the sheet passing over a suitable directing roll 27. In Fig. 6 the grippers have come into action and clamped the sheet and the jaws 8, 10 have opened to release the bight of the sheet. In Fig. 7, the jaw 10 is shown as having moved forward and straightened out the bent bight of the sheet.

The sheet may be delivered in any suitable manner, two modes of delivery being shown. In the construction shown in Fig. 2, the sheet is stripped from the carrier 5 by a set of guide fingers 28, the sheets being piled on a traveling belt 29, this character of delivery being well-known in the art. In the construction illustrated in the remaining figures, the sheet is taken by grippers 30 on a carrier 31, the sheet being delivered from this carrier in any suitable way, as, for instance, by strippers, and a belt, such as illustrated in Fig. 2. If desired, the sheets may be slit as they are delivered. In Fig. 2, a slit 32 is illustrated as operating in connection with the cylinder 5 and another similar slit 32' is shown in Fig. 1 as operating in connection with the carrier 31.

Changes and variations may be made in the construction by which this invention is carried into effect. The invention is not, therefore, to be limited to the specific construction herein described and illustrated in the accompanying drawings.

What is claimed is:—

1. The combination with a carrier provided with a pair of nipping jaws, of means for tucking the bight of a sheet thereinto, means whereby the sheet is delivered from the carrier, means for causing the jaws to release the bight of the sheet prior to the delivery thereof, and means for giving the jaw which underlies the sheet a movement with respect to the sheet to straighten the fold.

2. The combination with a carrier provided with a pair of nipping jaws, of means for tucking a bight of a sheet thereinto, means whereby the sheet is delivered from the carrier, means for causing the jaws to release the bight of the sheet prior to the delivery thereof, holding devices operating to hold the sheet when released by the jaws, and means for giving the jaw which underlies the sheet a movement with respect to the sheet to straighten the fold.

3. The combination with a carrier provided with a pair of nipping jaws, of means for tucking the bight of the sheet thereinto, means whereby the sheet is delivered from the carrier, means for causing the jaws to release the bight of the sheet prior to the delivery thereof, cooperating gripping devices operating to hold the sheet when released by the jaws, and means for giving the jaw which underlies the sheet a movement with respect to the sheet to straighten the fold.

4. The combination with a carrier provided with a pair of nipping jaws, one of said jaws being recessed, of means for tucking the bight of a sheet thereinto, means  
5 whereby the sheet is delivered from the carrier, means for causing the jaws to release the bight of the sheet prior to delivery, a gripper abutment extending into the recesses of the jaw, grippers cooperating with  
10 the abutment, and means for giving the re-

cessed jaw a movement with respect to the sheet to straighten the fold.

In testimony whereof, I have hereunto set my hand, in the presence of two subscribing witnesses.

WILLIAM SPALCKHAVER.

Witnesses:

F. W. H. CRANE,  
LOUIS ROEHM.