

(No Model.)

E. W. CARR.
PAPER FOLDER.

No. 512,944.

Patented Jan. 16, 1894.

Fig: 1.

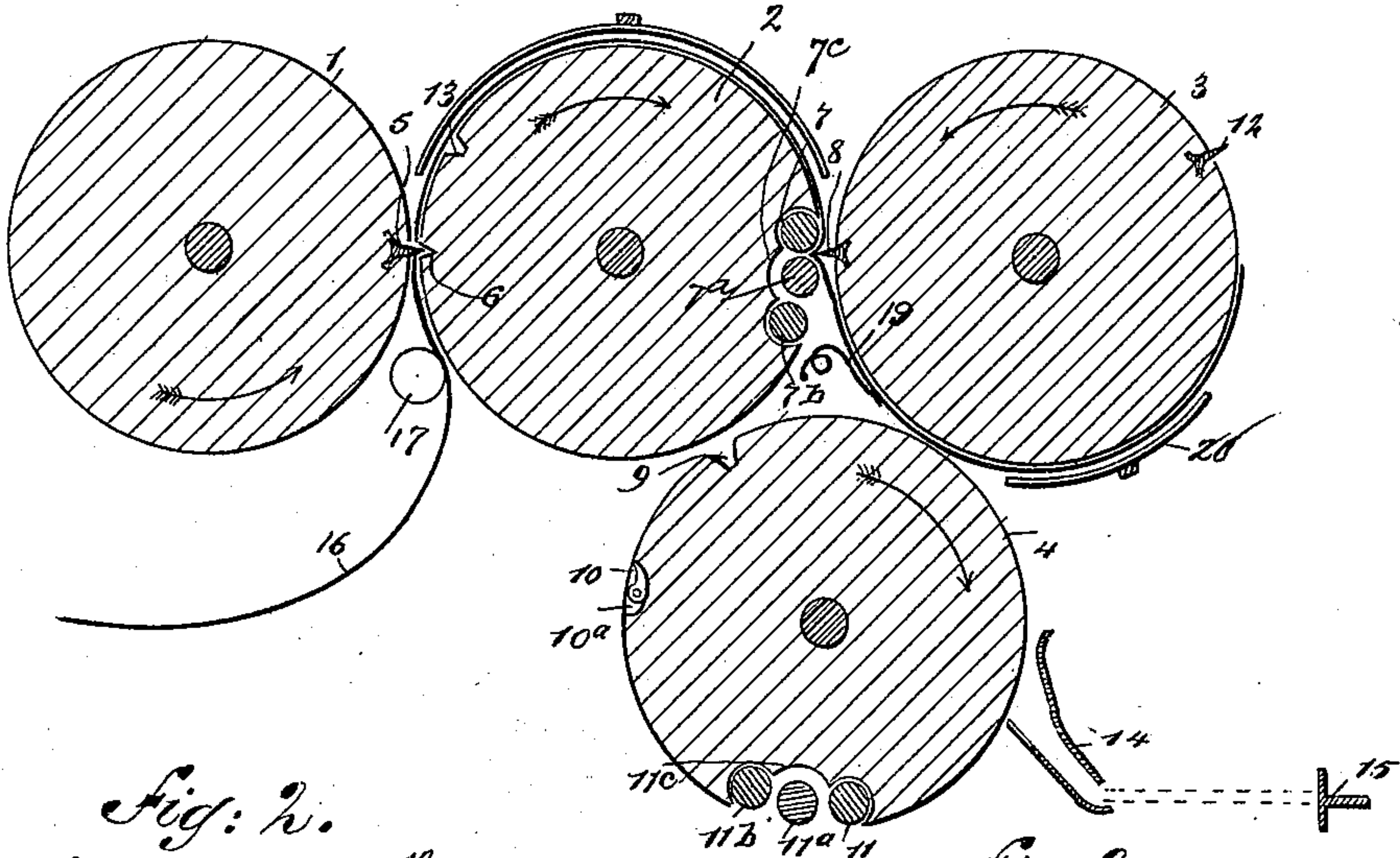


Fig: 2.

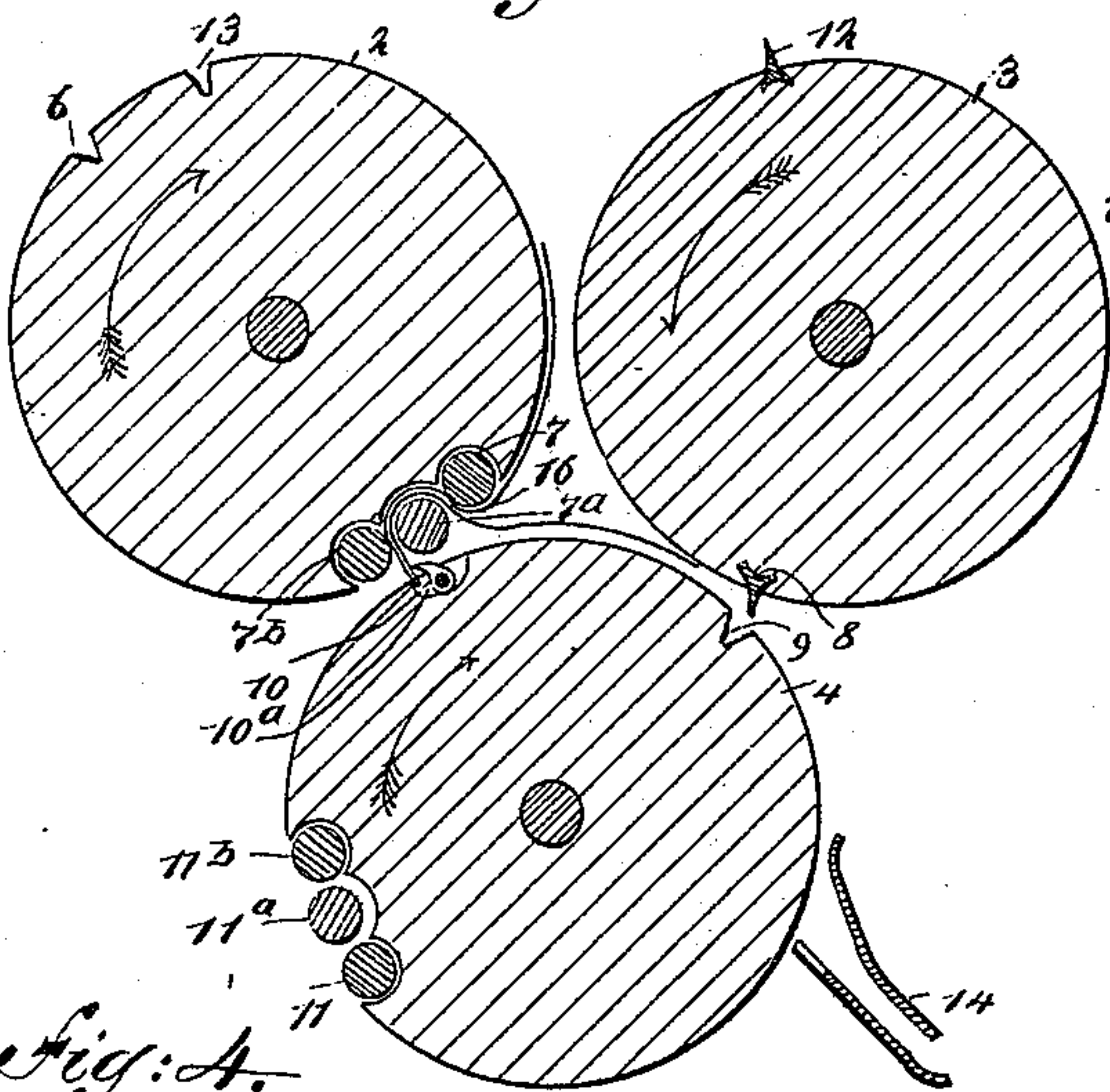


Fig: 3.

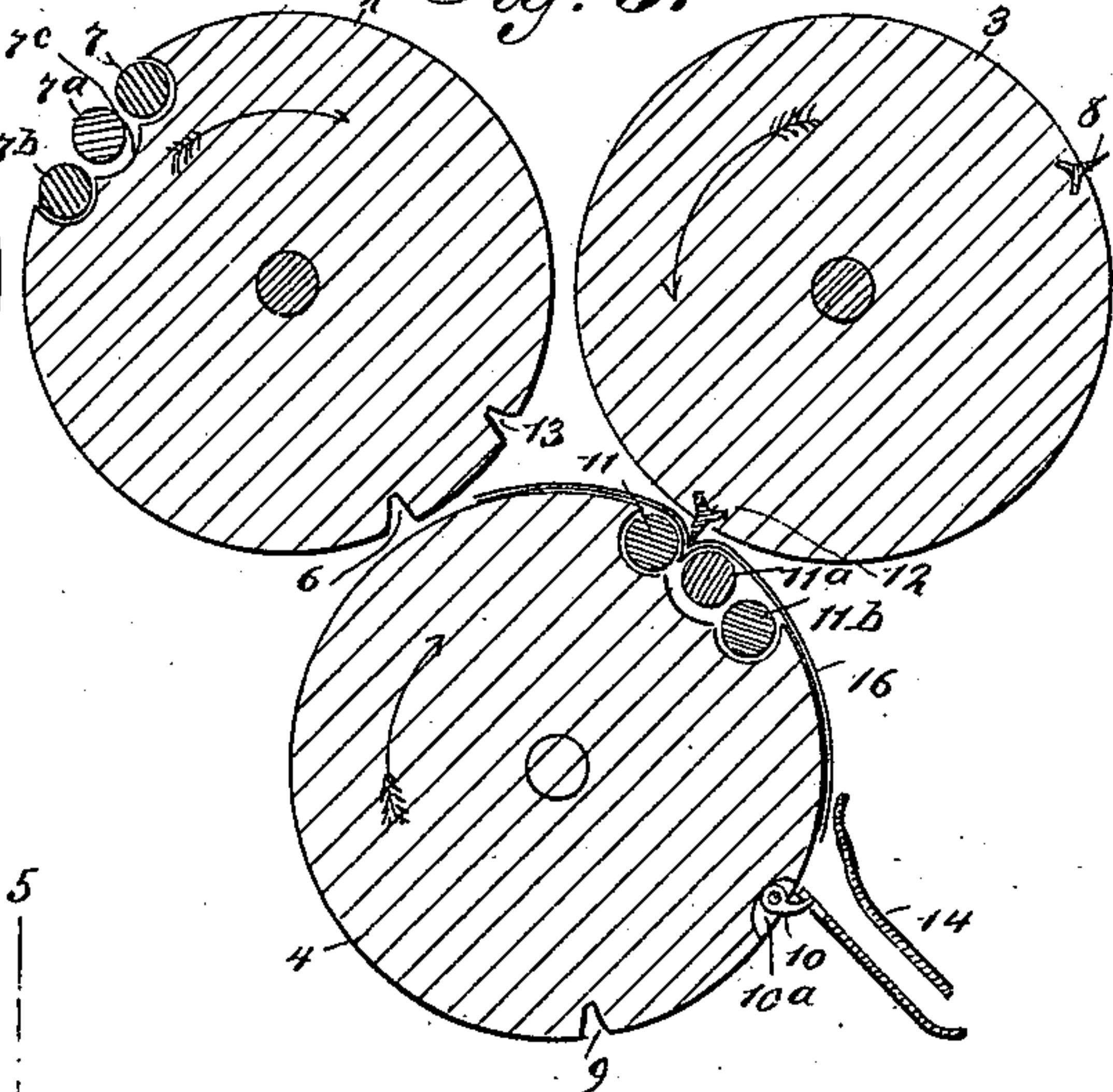
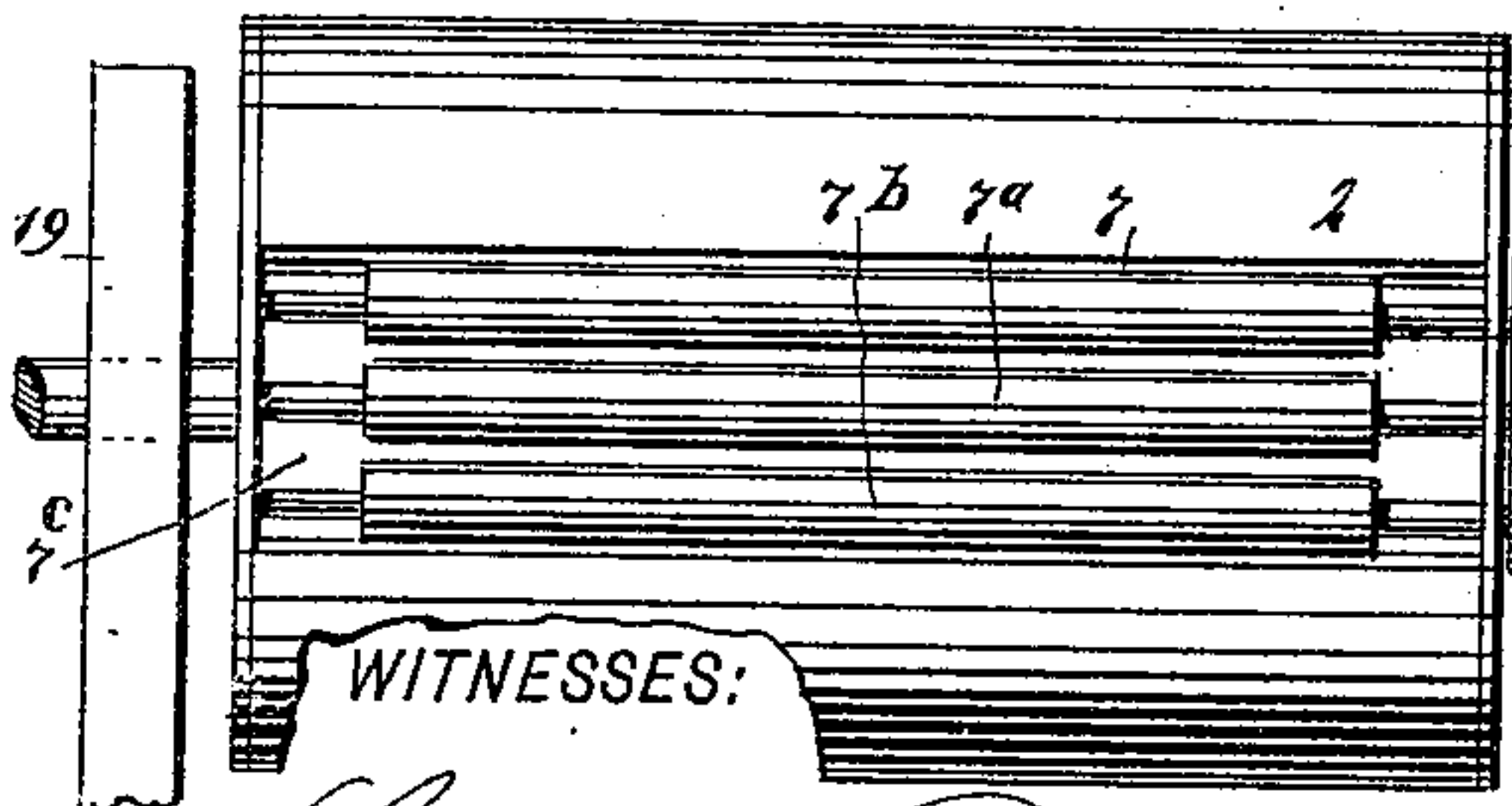


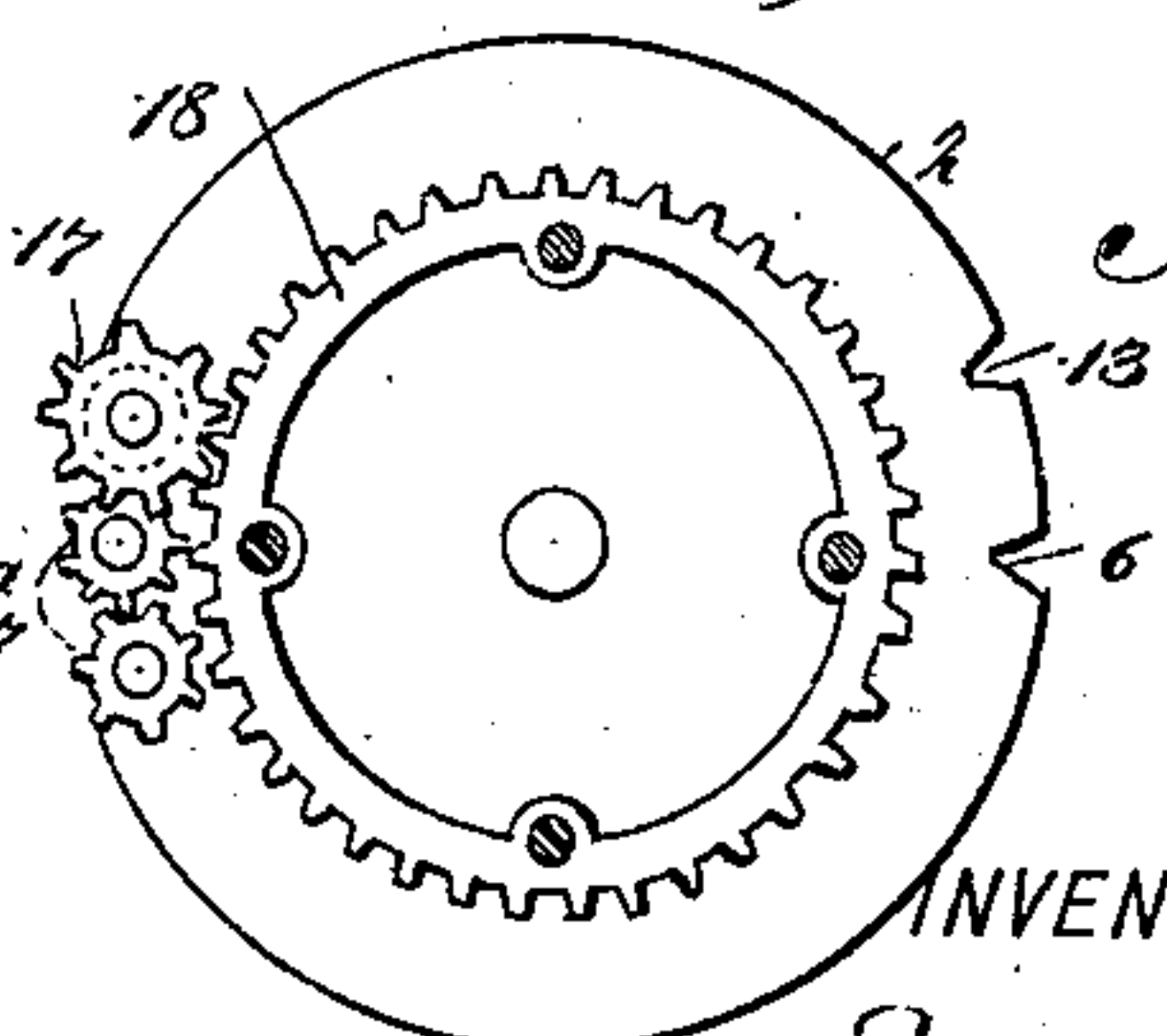
Fig: 4.



WITNESSES:

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Fig: 5.



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ELIJAH W. CARR, OF SAN ANTONIO, TEXAS.

PAPER-FOLDER.

SPECIFICATION forming part of Letters Patent No. 512,944, dated January 16, 1894.

Application filed March 30, 1893. Serial No. 468,251. (No model.)

To all whom it may concern:

Be it known that I, ELIJAH W. CARR, of San Antonio, in the county of Bexar and State of Texas, have invented a new and Improved Paper-Folder, of which the following is a full, clear, and exact description.

My invention relates to improvements in paper folders of the rotary kind. These folders, as heretofore constructed, have been very complicated and hence expensive and likely to get out of order, and they have also been constructed with movable folding knives and cutting blades and have usually been arranged so that the paper being folded has, at certain times, a backward movement through the machine.

The object of my invention is to produce a rotary paper folder which is adapted to fold newspapers, as they come from any kind of a press in a continuous web, to produce a machine of this class of the greatest simplicity, to arrange the parts of the apparatus so that paper will be cut into sheets of the correct length, to construct a folding attachment so as to form folds parallel with the columns of printed matter in the paper, and also to arrange the cylinders of the machine so that no knives are employed which move in relation to the cylinders; and, further, to arrange the apparatus in such a way that the paper sheets will be fed continuously forward and folded in the simplest possible manner.

To these ends my invention consists of certain features of construction and combinations of parts, as will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a sectional diagrammatic view of the folding cylinders and shows the position of the web as it is being cut and the position of the severed sheet as the first fold is being made. Fig. 2 is a diagrammatic view of the folding cylinders and shows the position of the sheet while the first fold is being rolled down and the sheet carried forward to be again folded. Fig. 3 is a similar view and shows the position of the cylinders while the second fold in the paper is being made. Fig. 4 is a broken detail view, showing the man-

ner in which the folding rollers in the cylinders are revolved; and Fig. 5 is a detail section on the line 5—5 in Fig. 4.

In carrying out my invention four cylinders, 1, 2, 3 and 4, are employed, these being arranged in series, as illustrated and as hereinafter described, and it will be understood that the cylinders may be supported and driven in any usual way, and this construction is therefore not shown in the drawings. The cylinder 1 serves in connection with the cylinder 2 as a cutting cylinder, while the cylinders 2, 3 and 4 serve as folding cylinders. The web as it comes from the press is fed between the cylinders 1 and 2 in any convenient way, and the cylinder 1 is provided on one side with a fixed knife 5 which registers with a groove 6 in the face of the cylinder 2, so that at each revolution of the cylinders 1 and 2, the web will be severed; and the size and speed of the cylinders are such that a sheet of paper cut off will correspond to the size of a newspaper; that is, the cuts will be made between each printed paper.

In the face of the roller 2, on the side diametrically opposite the groove 6 is a series of parallel folding rollers 7, 7^a and 7^b which turn in a recess 7^c in the face of the cylinder, but one of these rollers may be dispensed with without affecting the principle of the invention. The rollers are used in making the first fold in the paper and the paper is forced between the rollers 7 and 7^a by a common form of folding blade 8, which is secured to one side of the cylinder 3 and projects from its face. The cylinder 3 is timed so that the blade 8 will strike the paper at the center and partially double it so as to force the doubled portion between the rollers 7 and 7^a, after which it passes behind the roller 7^a and over the guide roller 7^b and is engaged by the grippers on the roller 4, as described presently. The roller 4 is also provided with a longitudinal groove 9 with which the blade 8 registers, and this enables the blade to pass the roller 4 without being broken.

The grippers 10 are held in a recess 10^a in the face of the roller 4 and are of the usual kind, and therefore not shown in detail. In the face of the roller 4 are arranged rollers 11, 11^a and 11^b, these being exactly like the

rollers 7, 7^a and 7^b described above, and they turn in a recess 11^c in the face of the cylinder. The rollers 11, 11^a and 11^b are used in making the second fold, and the paper is partially doubled and pushed between the rollers 11 and 11^a by a blade 12 on the cylinder 3, this blade being like the folding blade 8 above described.

The roller 3 turns opposite the roller 2 and consequently this roller is provided with a groove 13 to receive the blade 12 of the roller 3 and permit the blade to turn without injury. On the back side of the lower and last roller 4 is a chute 14 into which the paper is delivered after being twice folded and it is carried forward against an abutment 15, the paper being supported on the usual parallel rods and pushed down between the rods in the customary manner, so that the final fold, at right angles to the folds made by my folder, may be given it in the usual manner.

The rollers 7, 7^a and 7^b and the rollers 11, 11^a and 11^b are turned so as to give a continuous forward movement to the paper and they may be turned in any suitable way, but are preferably turned by the gear mechanism illustrated in Figs. 4 and 5. Here one of the roller shafts connects by means of a pinion 17 with a fixed gear 18 which is held in a stationary position by supports 19, and the several roller shafts are connected together by gears 17^a. Consequently as the cylinder 2 or 4, as the case may be, revolves, the pinion 17 travels around on the periphery of the gear 18, and movement is thus imparted to the several rollers.

Any suitable guiding mechanism can be employed for leading the paper web between the several cylinders, and I lay no claim to any mechanism of this kind, but a simple form of guiding mechanism is illustrated in Fig. 1. Here the roller 17, which is a common friction roller, turns close to the lower portion of the cylinder 2, so that the paper web 16 will be fed forward between the said roller and cylinder. Above the cylinder 2 are arranged curved finger rods 18, which prevent the paper from rising from the roller; and beneath the cylinders 2 and 3, and immediately above the cylinder 4, is a spring guide 19, one arm of which presses the paper web against the cylinder 3. Beneath the cylinder 3 is arranged a guide 20, which may be composed of a series of fingers or of a single sheet, and it will be seen that the several guiding devices hold the web snugly against the faces of the cylinders. As above remarked, however, any guiding mechanism suitable for the purpose may be used to direct the course of the web.

The course of the web through the machine

is as follows:—The web 16 enters between the rollers 1 and 2, and when it has traversed the distance corresponding to the length of a newspaper, the knife 5 registers with the groove 6 and cuts off the web. The severed paper is guided between the rollers 2 and 3 and the blade 8 strikes the severed sheet in the center and pushes its middle portion between the rollers 7 and 7^a which flatten the fold, and the doubled portion is now carried forward over the guide roller 7^b and is caught by the grippers 10 and carried forward with the roller 4, and the paper which has been once folded is made to lie over the rollers 11, 11^a and 11^b and is pushed between the rollers 11 and 11^a by the folding blade 12 and it passes behind the roller 11^a and over the face of the guide roller 11^b into the chute 14, where it is taken care of in the manner already specified.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A paper folder, comprising a series of three revoluble cylinders arranged to turn in parallel positions and with their faces adjacent to each other, parallel revoluble folding rollers held to turn in recesses in two of the cylinders, folding blades carried by the third cylinder and adapted to project between the rollers of the other two cylinders, and a cutting cylinder arranged in advance of the first folding cylinder and having a projecting blade to enter a groove in the said cylinder, substantially as described.

2. A paper folder, comprising three revoluble parallel folding cylinders arranged in a substantially triangular position, revoluble rollers held in the faces of two of the cylinders, projecting folding blades arranged on the second cylinder of the series and adapted to enter between the rollers of the other two cylinders, and grippers arranged on the third cylinder of the series and adapted to engage and carry forward a paper delivered from the first two rollers, substantially as described.

3. In a paper folder, the combination of a folding cylinder having a recessed face, revoluble rollers held to turn in the said recess and arranged to lie within the face of the cylinder, the inner wall of the recess lying close to the inner faces of the rollers and serving as guides for the paper web, the rollers being adapted to feed a web of paper between them, and a second folding cylinder having a folding blade adapted to project between the folding rollers, substantially as described.

ELIJAH W. CARR.

Witnesses:

CHARLES F. COTTON,
LEWIS L. LACEY.