No. 653,318. Patented July 10, 1900.

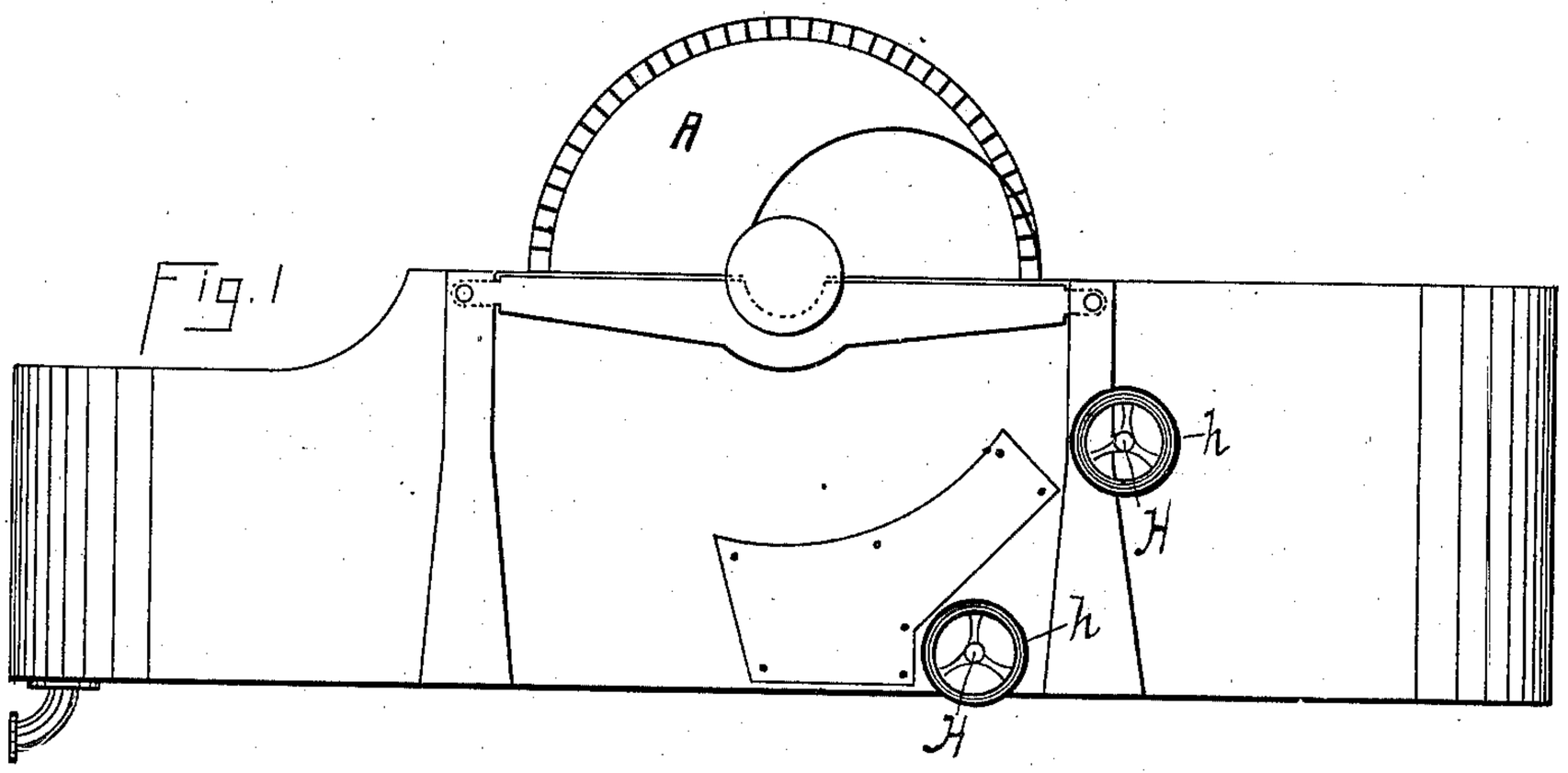
A. F. SCHOLZ.

BEATING ENGINE.

(Application filed Apr. 5, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1



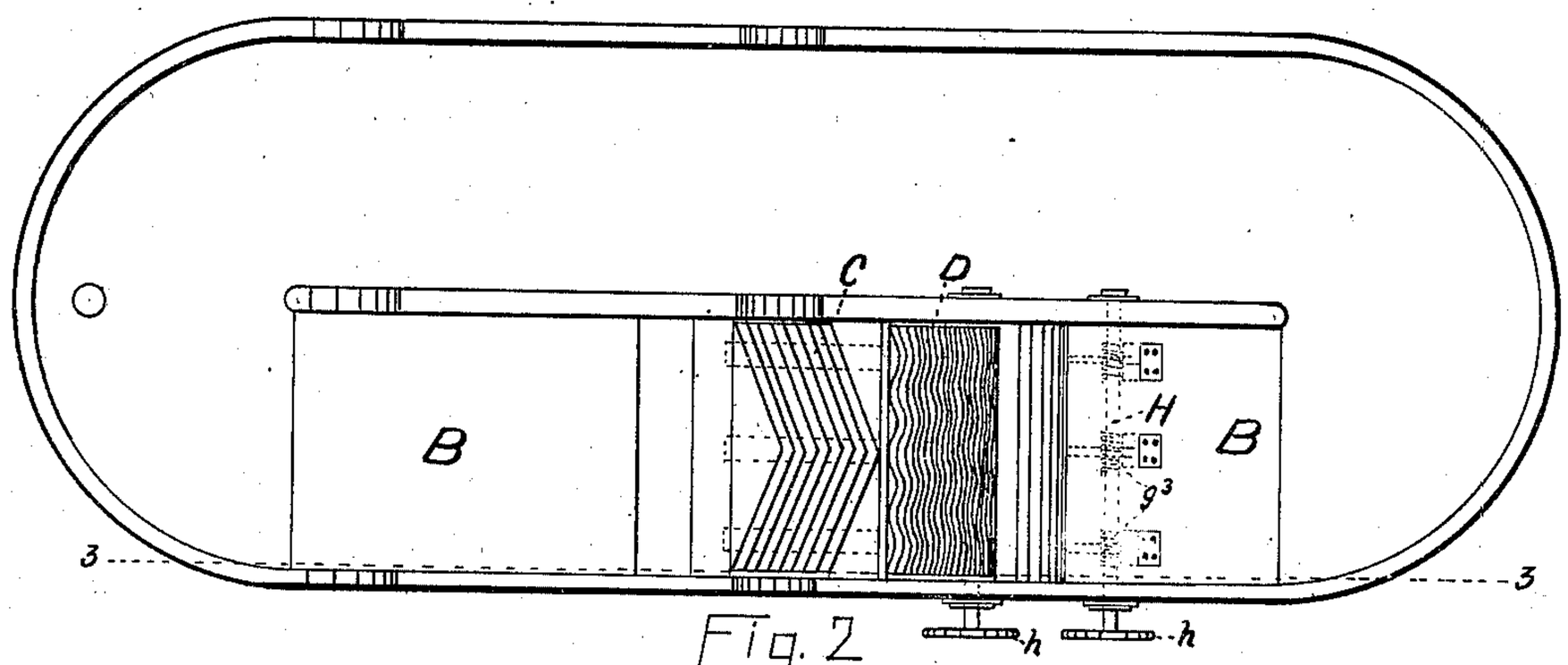


Fig. 2

Fig. 3

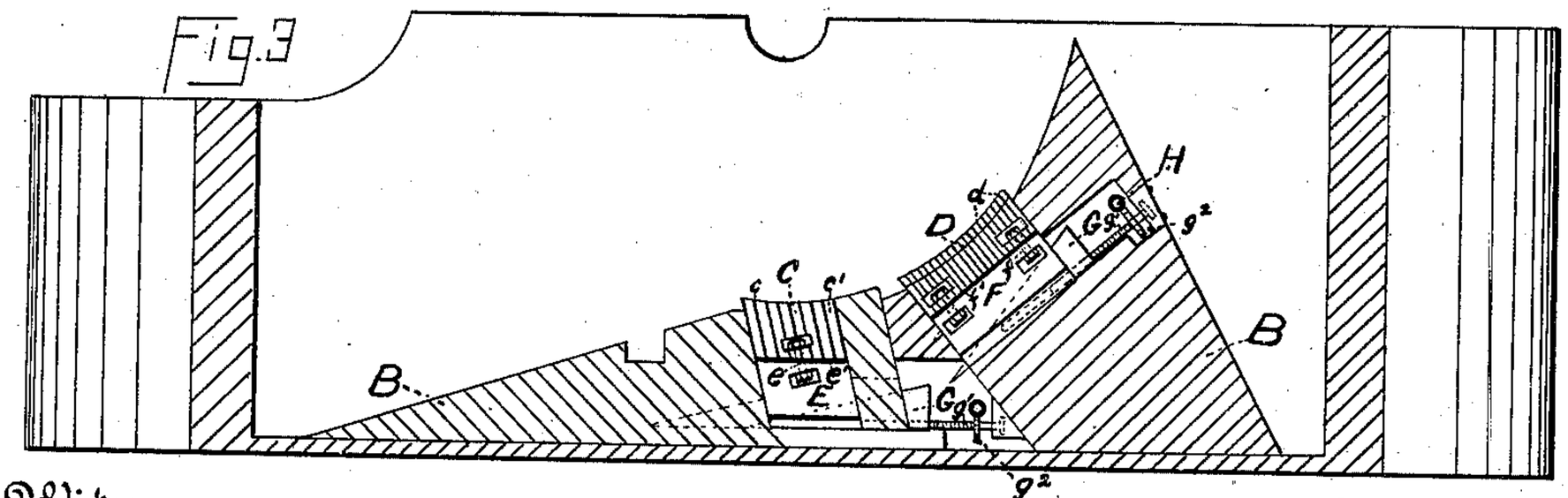


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Fig. 4

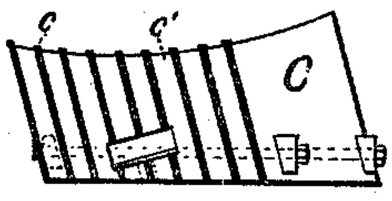


Fig. 6

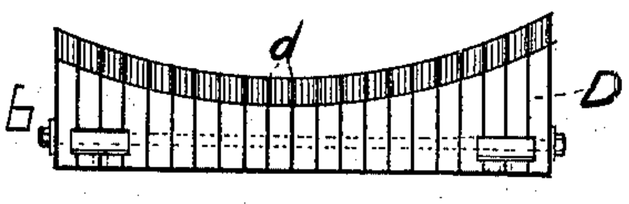


Fig. 5

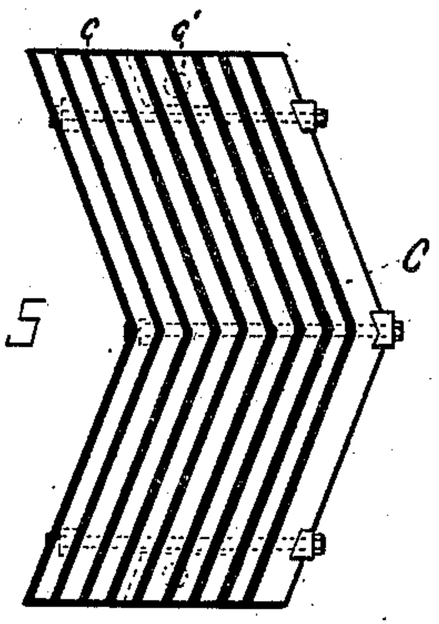


Fig. 7

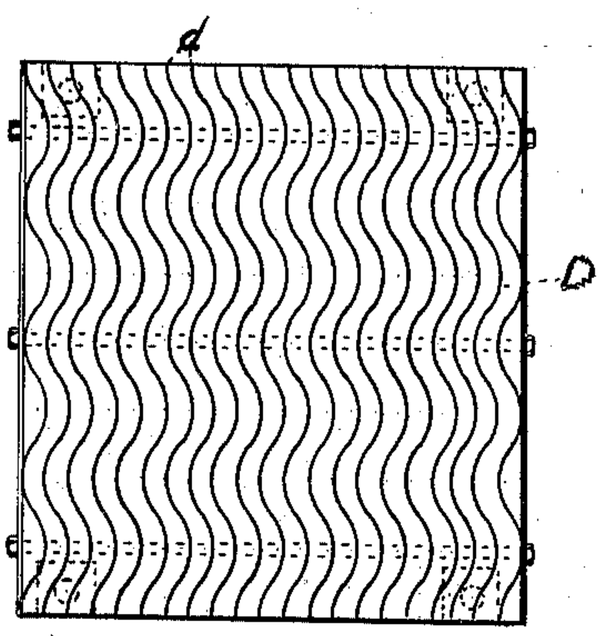
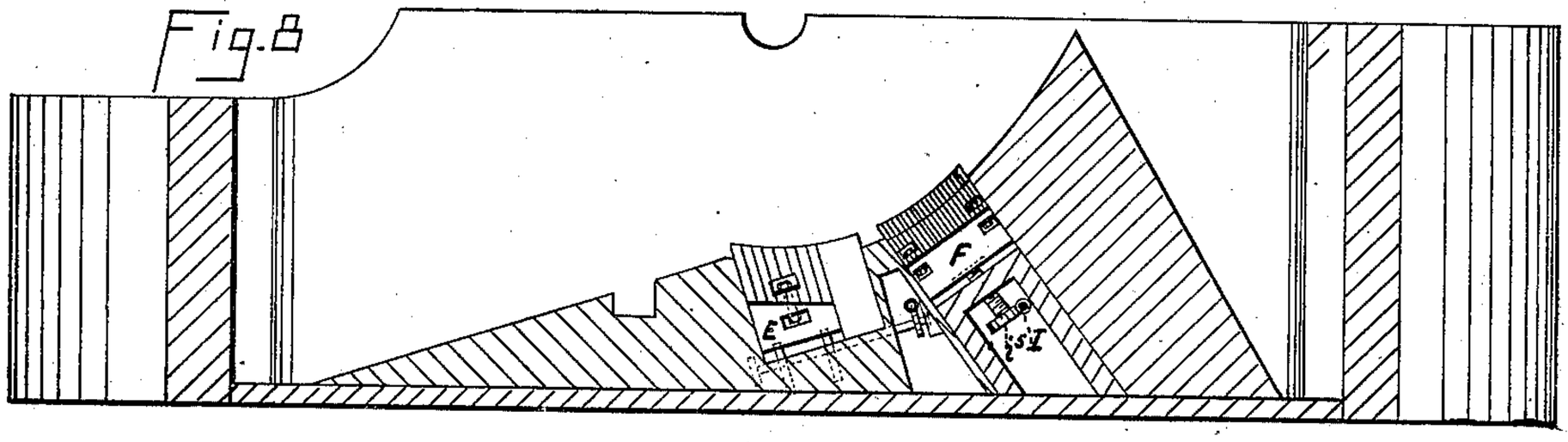


Fig. 8



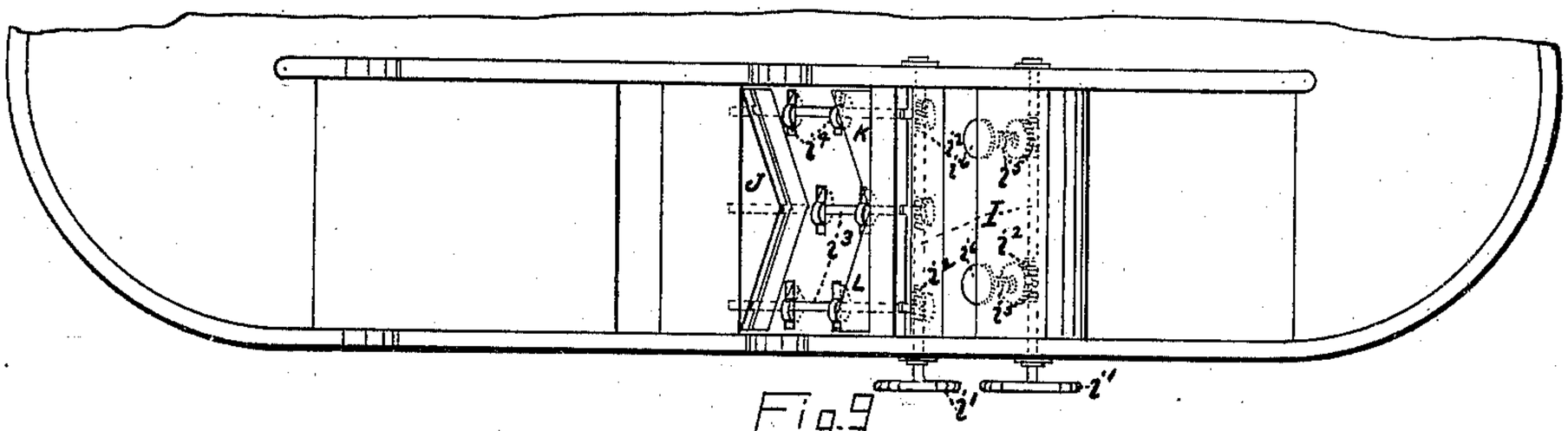


Fig. 9

Fig. 10

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UNITED STATES PATENT OFFICE.

ADOLPH F. SCHOLZ, OF WEST CHESTER, OHIO.

BEATING-ENGINE.

SPECIFICATION forming part of Letters Patent No. 653,318, dated July 10, 1900.

Application filed April 5, 1897. Serial No. 630,748. (No model.)

To all whom it may concern:

Be it known that I, ADOLPH FREDERICK SCHOLZ, a citizen of the United States, residing at West Chester, in the county of Butler and State of Ohio, have invented certain new and useful Improvements in Beating-Engines for Making Paper, of which the following is a specification.

My invention relates more specially to apparatus for treating material to be used for making paper.

In the process of making paper the stock is first reduced to a certain degree of fineness in a beating-engine and then drawn off and pumped through a finishing-engine, after which it is ready for other processes. This transfer of the material causes much delay and involves needless labor. The two sets of apparatus involve additional cost and occupy space which might be more usefully employed. The finishing-machines now in use operate upon all material to the same extent and have no means of varying the treatment. The result is that sometimes the fibers produced are too short and at other times too long. If too short, there is no remedy. If too long or if imperfectly finished, the only means afforded for reducing the length or completing the finish is to again run them through the finishing-machine. If this is done, they are generally reduced to too great an extent.

The cutting-plate ordinarily used in beating-engines is composed of a series of knives projecting vertically above the body of the plate. These knives have to be sharpened from time to time; but after being sharpened they do not give satisfactory results until they are worn to a certain extent, when they reach their maximum efficiency, after which they become less efficacious until they are again sharpened.

The object of my invention is to provide a machine which will perform both the beating and finishing operations, in which the beating mechanism is more efficiently applied, and in which the operator may inspect the stock at will, thereby enabling him to judge of the stock on hand. I accomplish this partly by using a roll revolving on stationary bearings and a fall-block containing adjustable cutting-plates, one of which carries broad and comparatively-few knives and the other thinner and more numerous knives. The former is used as the reducing-plate, and when the pulp has reached a certain degree of fineness the second plate is adjusted to do the finishing. Both plates may be used in the finishing process. I also mount the knives in the reducing-plate at an incline to the path of wear, thereby always presenting an acute edge in spite of wear.

My invention consists in the apparatus and the combination and arrangement of parts, hereinafter described and claimed.

In the drawings, Figure 1 is an elevation of a beating-machine provided with my invention. Fig. 2 is a top plan of the engine shown in Fig. 1 with the roll removed. Fig. 3 is a vertical section on lines 3 3 of Fig. 2; Fig. 4, an elevation of my reducing-plate; Fig. 5, a top plan corresponding to Fig. 4; Fig. 6, an elevation of my finishing-plate; Fig. 7, a top plan corresponding to Fig. 6. Fig. 8 is a vertical section similar to Fig. 3, showing other means of adjusting my cutting-plates. Fig. 9 is a top plan corresponding to Fig. 8, with the cutting-plates removed. Fig. 10 is a detail of one means of adjustment.

In the drawings, A is a roll constructed in the ordinary manner and mounted on stationary bearings.

B is a fall-block in which the cutting-plates C and D operate.

E and F are heavy plate-beds, to which C and D are bolted by means of bolts *e e*.

e' and *f'* are pads comprised of leather, lead, or other padding material, which, with the heavy plate-beds E and F, tend to deaden any shocks communicated to the cutting-plates C and D.

The cutting-plate C is composed of knives *c*, with interposed blocks of wood *c'*, fastened together in such manner as to form a practically-solid block and so shaped and arranged as to present a concave cutting-surface having a curvature corresponding with the surface of the roll. The wooden blocks *c'* are so shaped and placed that the grain runs from knife to knife, thereby presenting a surface less likely to receive and hold foreign substances, such as pebbles or other solid substances, likely to get into the material. The knives *c* are placed in the plate C at an acute angle to the radii of the roll, the cutting end

of the knives being directed toward the approach of the pulp, so that as the knives wear down they will always present an acute cutting edge, as shown in Fig. 4. The wooden blocks c', being softer than the knives and presenting their fibers transversely to the wear, are worn away faster than the knives, so that the material is always fed against the cutting edges of the knives. I also prefer to place the knives and blocks of wood in the plate C so that they will present an obtuse angle in a horizontal plane to the approach of the pulp, as shown in Fig. 5. The finishing-plate D is composed of knives d, arranged in parallel waves, as shown in Fig. 7. These knives are thinner and more numerous than those of plate C and are approximately perpendicular to the plane of the wear.

In Figs. 2 and 3 I have shown one method of adjusting the plates C and D. This is done by means of wedges G, which are operated by set-screws g', which are actuated by cog-wheels g^2, taking in endless threads g^3. The threads g^3 are actuated by a hand-wheel h on the shaft H. The plate C is kept in place by means of wedges J K L, which are provided with grooves for the binding-screw nuts to work in.

Figs. 8, 9, and 10 show two other forms of adjusting apparatus. In them I is a shaft carrying a hand-wheel i' and endless threads i^2. In one of these forms the threads i^2 actuate shafts i^3, which carry eccentric bearings i^4. The plate-bed rests on the eccentric bearings i^4 and may be adjusted by rotation of hand-wheel i'. In the other form of adjusting apparatus the threads i^2 of shaft I actuate large set-screws i^5, which have direct bearings on the plate-bed through disks i^6.

I am aware of the fact that the combination of a roll revolving on stationary bearings with an adjustable cutting-plate has been used before and do not claim such broadly.

I claim—

1. The combination, in a machine for treating paper-stock, of a cutting-plate adapted to reduce the stock; a cutting-plate adapted to finish the stock; a roll adapted to bring the stock in contact with the cutting-plates; and mechanism whereby either cutting-plate may be thrown into or out of action, substantially as and for the purpose set forth.

2. The combination, in a machine for treating paper-stock, of a cutting-plate having thick knives with comparatively-wide spaces between them and adapted to reduce the stock, a cutting-plate having thin knives with comparatively-narrow spaces between them and adapted to finish the stock; a roll adapted to bring the stock into contact with the knives; and mechanism whereby either cutting-plate may be thrown in or out of action, substantially as and for the purpose set forth.

3. The combination, in a machine for treating paper-stock, of a cutting-plate containing knives placed at an acute angle with the surface of wear, the outer or cutting ends of the knives being thrown forward toward the approach of the pulp, substantially as and for the purpose set forth.

4. The combination, with the roll of a machine for treating paper-stock, of a cutting-plate containing knives placed at an angle to the radii of the roll, the outer or cutting ends of the knives being thrown forward toward the pulp, substantially as and for the purpose set forth.

5. The combination, in a machine for treating paper-stock, of a roll; a cutting-plate having knives placed at an angle with the radii of the roll, the outer or cutting ends being thrown forward toward the approach of the stock, and adapted to reduce the stock; a cutting-plate having knives approximately normal to the surface of wear; and mechanism whereby either cutting-plate may be thrown in or out of action, substantially as and for the purpose set forth.

6. The combination, in a machine for treating paper-stock, of a roll revolving in stationary bearings; a cutting-plate having knives placed at an angle with the radii of the roll, the outer or cutting ends being thrown forward toward the approach of the stock, the knives being arranged parallel to each other, and forming an angle at the center whose apex is turned away from the approach of the stock; a cutting-plate containing knives approximately normal to the surface of wear and arranged in parallel waves; and means for throwing either cutting-plate in or out of action, substantially as and for the purpose set forth.

ADOLPH F. SCHOLZ.

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