

METHOD OF AND APPARATUS FOR APPLYING SOLUTIONS OR FLUIDS
TO TRAVELING WEBS.

APPLICATION FILED AUG. 12, 1904.

2 SHEETS—SHEET 1.

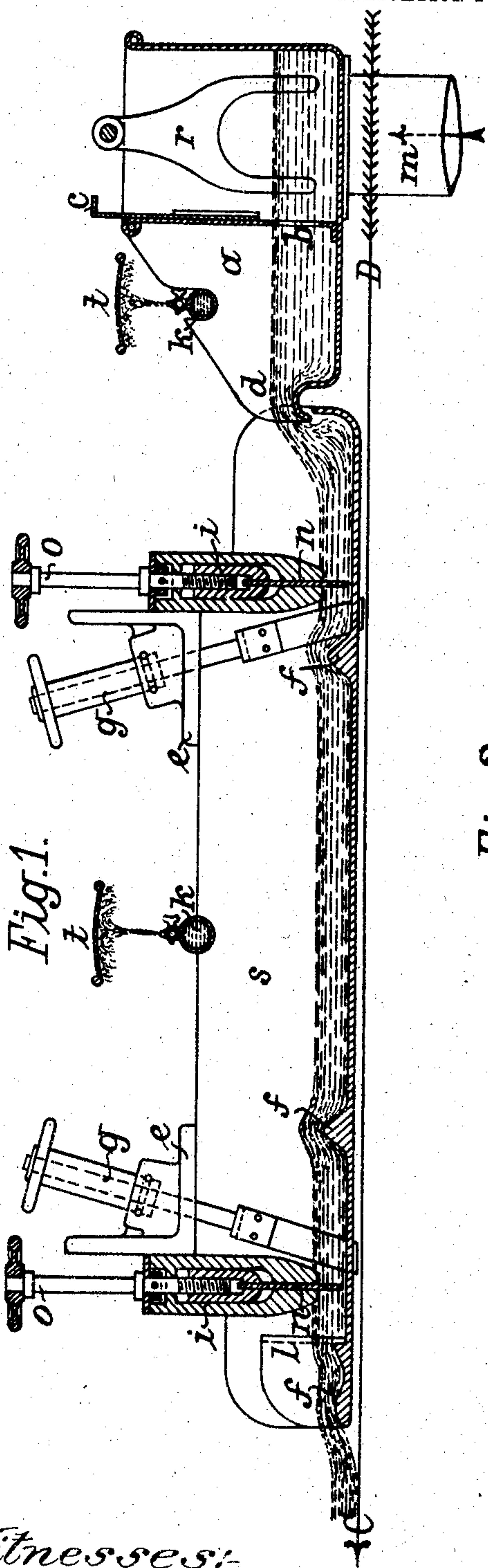


Fig. 1.

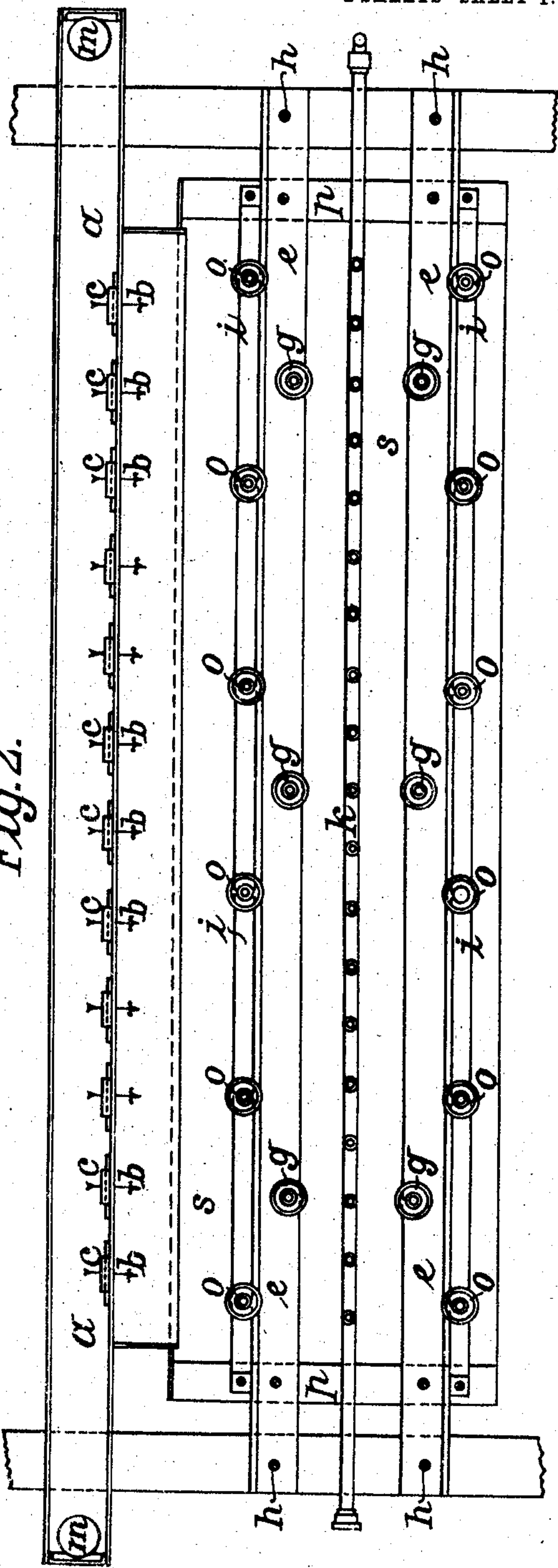


Fig. 2.

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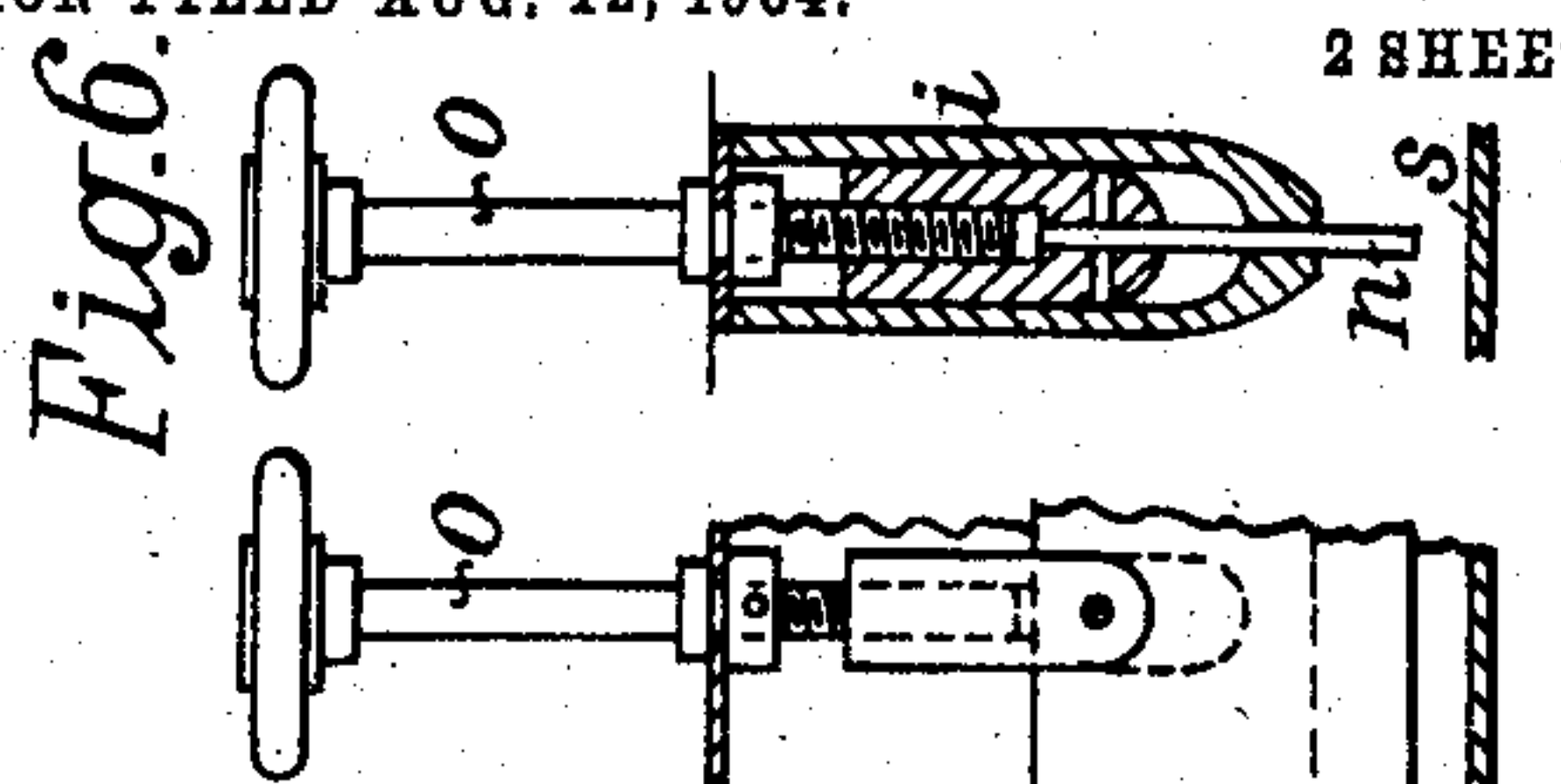
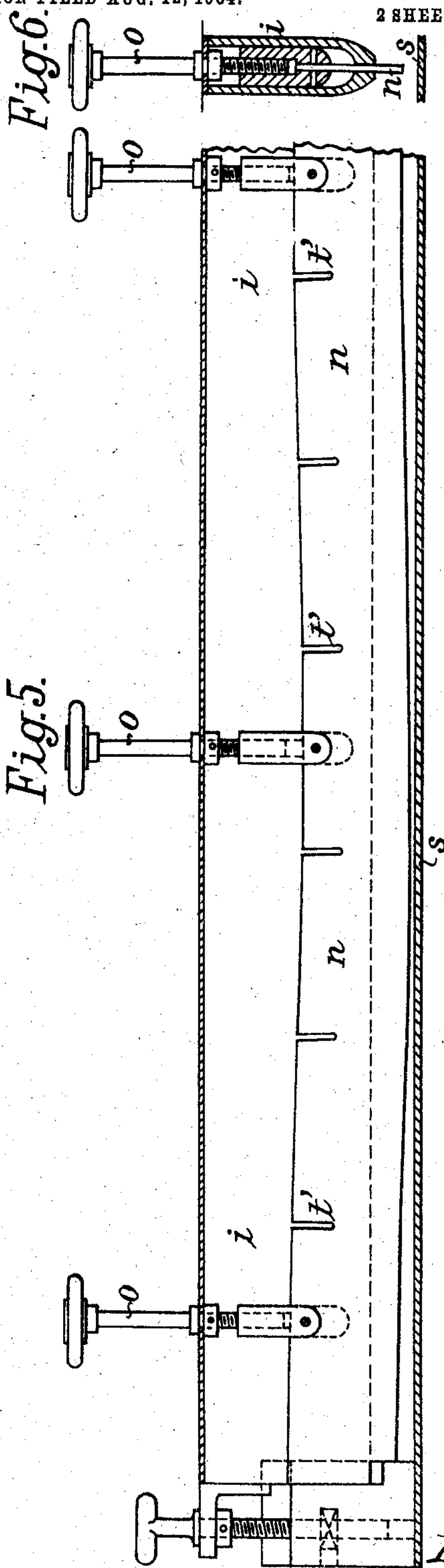
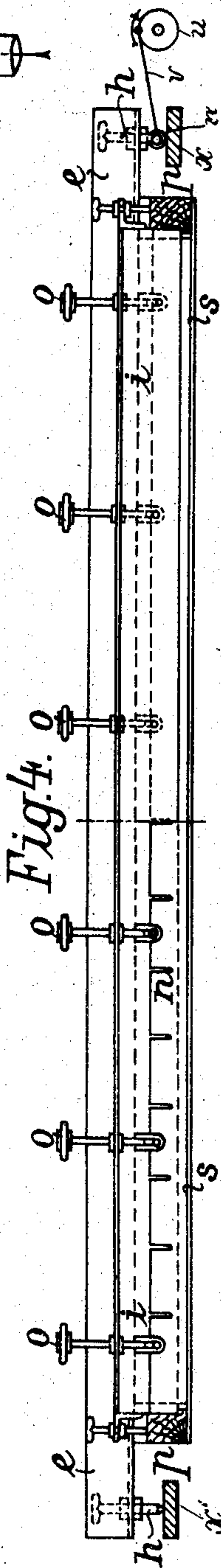
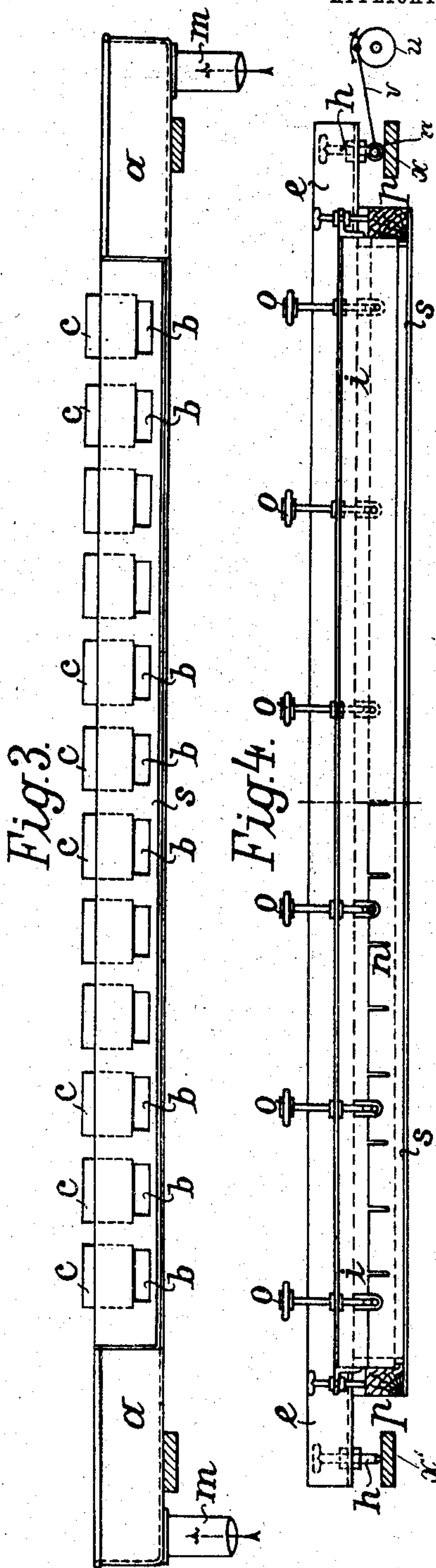
R. KRON.

PATENTED JAN. 24, 1905.

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TO TRAVELING WEBS.

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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE

RUDOLF KRON, OF GOLZERN, GERMANY.

METHOD OF AND APPARATUS FOR APPLYING SOLUTIONS OR FLUIDS TO TRAVELING WEBS.

SPECIFICATION forming part of Letters Patent No. 780,670, dated January 24, 1905.

Application filed August 12, 1904. Serial No. 220,465.

To all whom it may concern:

Be it known that I, RUDOLF KRON, a citizen of the Republic of Switzerland, and a resident of Golzern, Kingdom of Saxony, German Empire, have invented a new and useful Method of and Apparatus for Applying Solutions or Fluids to Traveling Webs, of which the following is a specification.

Various methods are at present employed in the manufacture of compound or multiple papers or boards for successively running the same or different "stuff" solutions or pulps upon a continuously-traveling web; but the feed-regulators and distributing devices hitherto employed for this purpose work so imperfectly that while they permit of making coarse duplex papers and boards finer layers or coats, especially of less easily distributed solutions or fluids, can either not be applied with them at all or at best only very unevenly.

The present invention consists of an improved method and apparatus for uniformly "flowing" and distributing celluloid, casein, glue, earths, color, rubber, and like solutions or fluids upon paper, woven materials, and the like—for example, for the immediate production of chromo-paper and sized or coated cardboard on the paper-making machine.

This process consists as follows:

1. First of all the solution flowing transversely onto the web is permitted to distribute itself evenly and regularly the entire width of the web and to compose itself upon a broad surface before it is poured onto the continuously-traveling web to be coated on one side.

2. A slowly-increasing longitudinal flow is imparted to the properly-distributed solution, which at the outlet or flowing point attains exactly the speed of the continuously-traveling web to be coated on one side.

3. The thickness or depth of the outflowing stream can be varied as desired at any point.

4. Any foam or air-bubbles produced are at once removed in the known way by a spray or rain of atomized water.

For carrying this process into practical effect I have devised arrangements for effecting the feed or supply of the fluid, for dis-

tributing it, and for flowing it upon the web or the like, which arrangements are illustrated in the accompanying drawings.

Figure 1 shows this apparatus in cross-section, and Fig. 2 is a plan, while Figs. 3, 4, 5, and 6 are views of various details.

At the head of the apparatus is disposed a trough *a*, divided into two compartments. The fluid to be distributed is supplied to the first of these compartments at both sides from above or below or from the transverse side. In Figs. 1, 2, and 3 the fluid is admitted to the first compartment from below by the supply-pipe *m*, a reciprocating or rotary stirrer *r* being arranged in this compartment. From the first compartment the liquid passes into the second compartment through a number of sluice-like openings *b*, disposed close together and adapted to be closed or throttled by adjustable slides or valves *c*. The second compartment terminates in an overflow or lip *d*. To the overflow *d* is connected a wide flat distributing-box *s*, with an elastic or resilient bottom, this box being suspended from two angle bars or rails *e*. At the bottom of the box *s* are anumber of obstructions *f*, serving to compose the liquid. The last of these obstructions is formed as a weir-like overflow or lip in such manner that the liquid can flow out without shock onto the web to be coated on one side, which travels continuously under this lip close under the box in the direction of the arrow C D.

By means of the suspending-screws *g* the elastic bottom of the box *s* can be set up or down in such manner that the liquid is distributed evenly and regularly over the whole width. Further, the whole box *s* can be given more or less inclination or fall by means of the adjusting-screws *h*, so that the fluid reaches the point of delivery or outflow at the proper speed. As further means of regulating the outflow over the entire width doctors or strickles *i* are provided at desired points, these consisting of a strong or resisting body in which are fitted metal tongues *n*. These metal tongues can, as seen from the left in Fig. 4 and in longitudinal and cross-section, Figs. 5 and 6, be put in tension by adjusting-screws *o*, disposed close to each other in such man-

ner as to impart a flat, concave, convex, or undulated form to the bottom edge of the doctor-blades. By these adjustments the solution is fed to the outflow or flowing point at a gradually-increasing speed, attaining at the outflow a speed corresponding with the speed of the web. To enable the metal tongues to bend in the manner mentioned, it is necessary to provide them with notches, slots, or gaps t' at the top.

In order to disperse foam and air-bubbles, a fine spray or mist is produced in the known way above the trough a and the box s . In the present case this is effected by allowing the fine jets of one or more spraying-pipes k to strike against plates t , arranged above said jets, whereby the jets are atomized and fall back as a fine mist or rain, which causes any foam or air-bubbles produced in the fluid to burst.

It may be preferable to produce a transverse shaking or vibrating motion of the suspended distributing-box $p s$. For this purpose one of the adjusting-screws h may be provided at its lower end with a roller w , as shown at the right-hand side of Fig. 4. The pin of a crank-disk u is connected by a connecting-rod v with the pin or trunnion of the roller w , so that on rotating the crank-disk u a to-and-fro movement is given to the distributing-box $p s$. The roller w is supported on the stationary surface x , whereas the adjusting screw or screws h on the left-hand side of the distributing-box move on the stationary surface or plate x' . A similar means for producing the transverse shaking of the distributing-box may be applied in connection with the adjusting-screw on the other side of the box.

The operation of the apparatus is apparent from the above description. It only needs to be added that one and the same distributing arrangement can be arranged or adapted for varying widths of web, so that the outflow of the fluid will take place over a portion of the width of the traveling web or in separate or distinct strips or parts of the width. For this purpose it suffices to throttle or reduce the width of the outflow by means of two horizontally-adjustable slides l , or the side parts or members p can be made adjustable in width or breadthwise. By disposing a number of the described distributing apparatus one behind the other or side by side different

solutions or fluids can be "flowed" or applied side by side or behind or upon each other.

What I claim is—

1. Method for uniformly "flowing" or applying solutions or fluids upon a continuously-traveling web or surface to be coated with same on one side, characterized in that the solutions or fluids are fed to the outflow or "flowing" point with a gradually-increasing speed, attaining at the outlet to the speed of the web or surface to be coated, the thickness or depth of the outflowing stream being varied as desired at any point of the outflow of liquid, while any foam or air-bubbles produced are dispersed by a spray falling upon the stream of the liquid, substantially as described and specified.

2. In an apparatus for carrying out the method for uniformly "flowing" or applying solutions or fluids on a continuously-traveling web or surface, the combination with a supply-trough divided into two compartments which communicate with each other by a number of openings provided with slides or valves and the second of which compartments is provided with an overflow, of a suspended distributing-box having an elastic bottom which is provided with obstructions and adjusting-screws for regulating the flow of material, doctors or strickles with adjustable resilient blades for the uniform distribution of the material, and spraying-pipes for obviating the formation of foam and air-bubbles, substantially as described and specified.

3. In an apparatus for effecting the flow of fluids on a continuously-traveling web or surface, the combination with a supply-trough and a suspended distribution-box having an elastic bottom, of a crank-disk, a connecting-rod, a roller provided at the lower end of the adjusting-screw and a supporting-plate at the side of the distributing-box for producing a shaking or vibrating motion of the distributing-box, substantially as described and specified.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 30th day of July, 1904.

RUDOLF KRON.

Witnesses:

OTTO H. KNOOP,
GEORG HEUSSINGER.