

(No Model.)

C. KELLNER.
APPARATUS FOR PREPARING CELLULOSE FOR MANUFACTURING
SPUN FABRICS.

No. 603,333.

Patented May 3, 1898.

Fig. 2

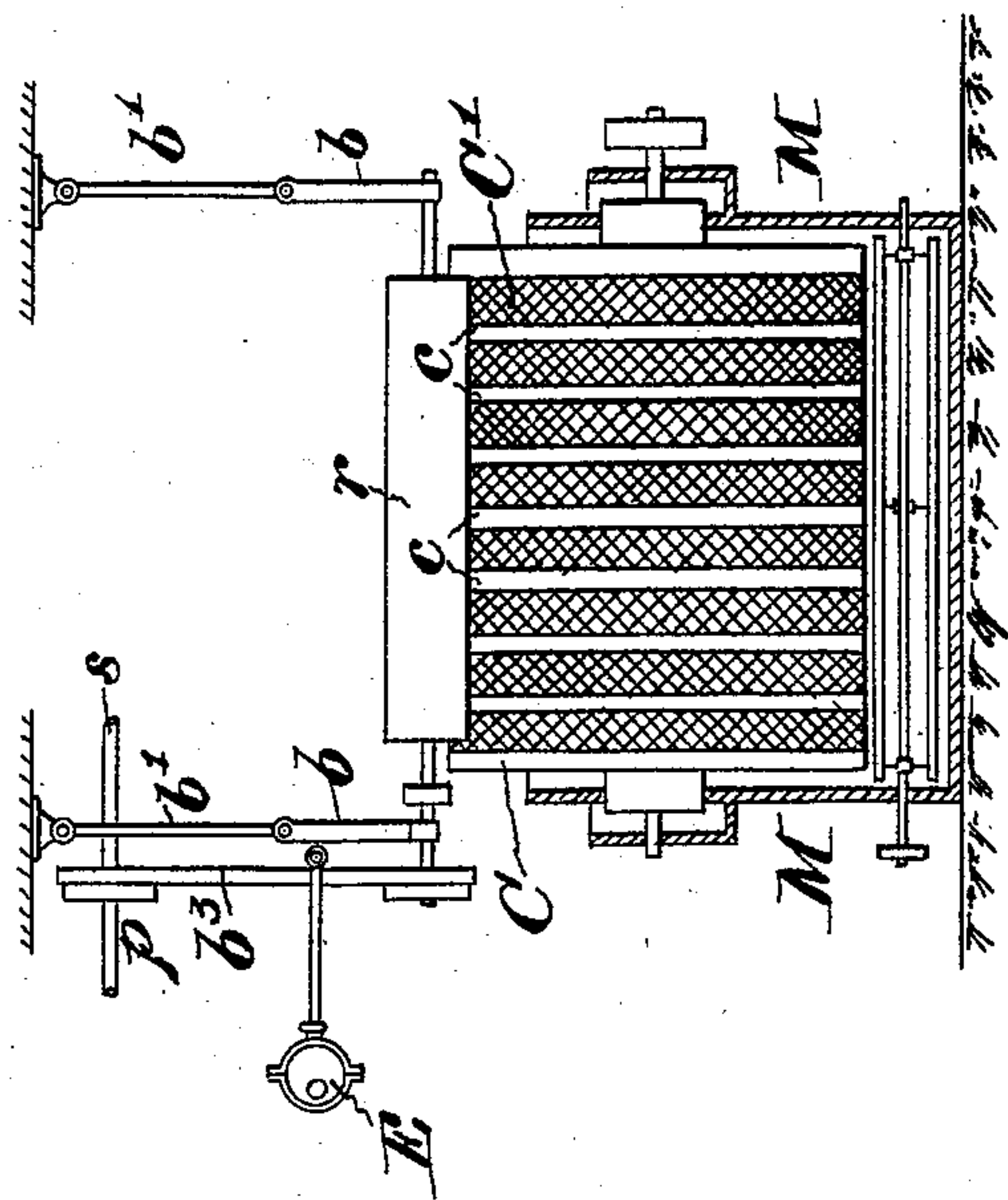


Fig. 1

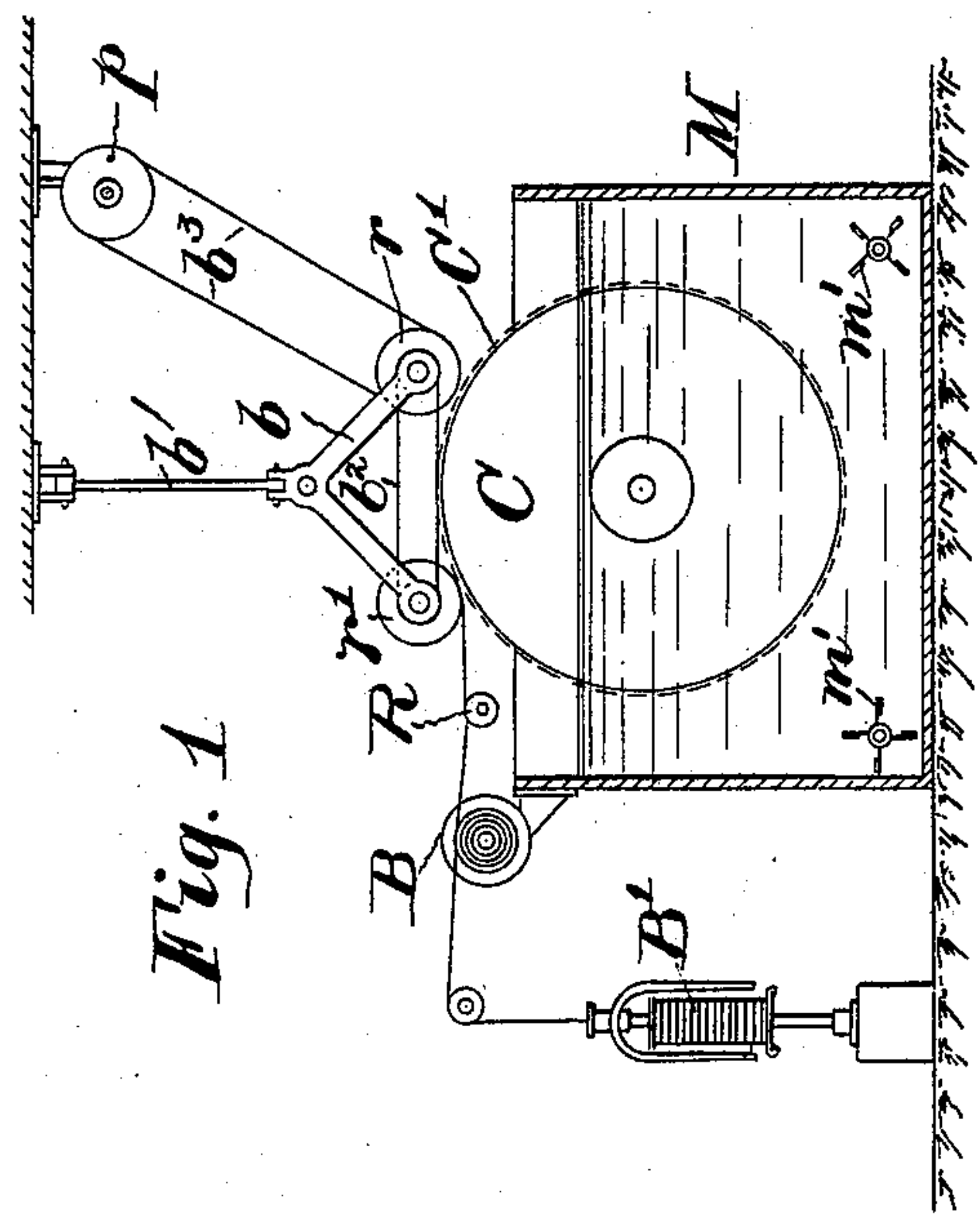


Fig. 3, F

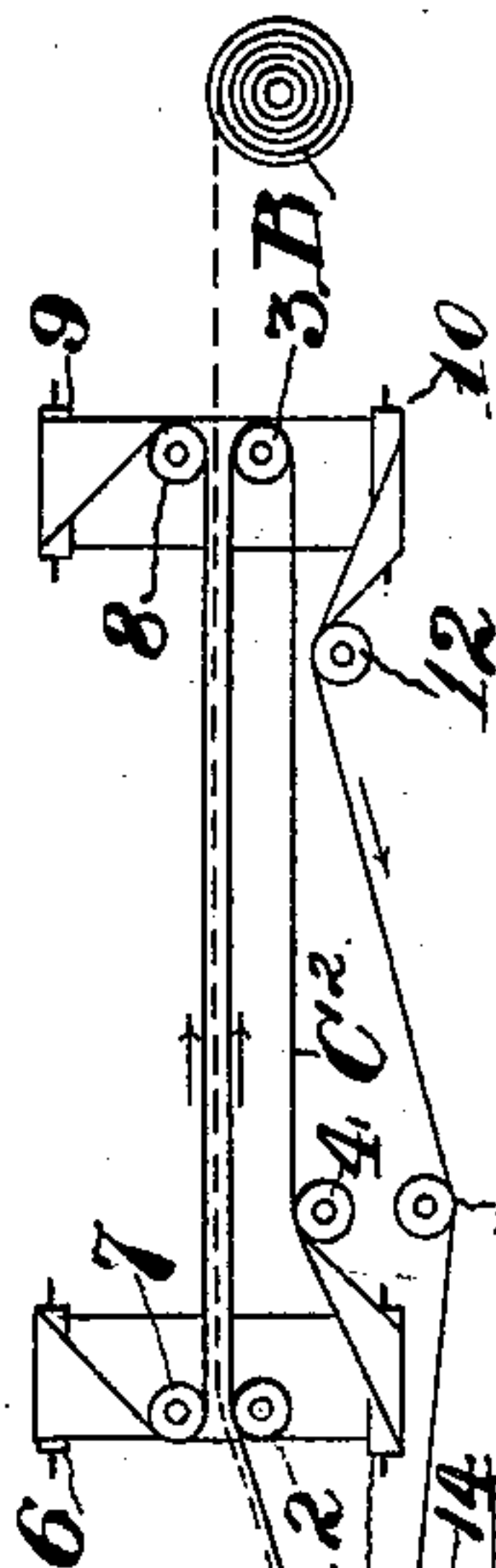


Fig. 3, a

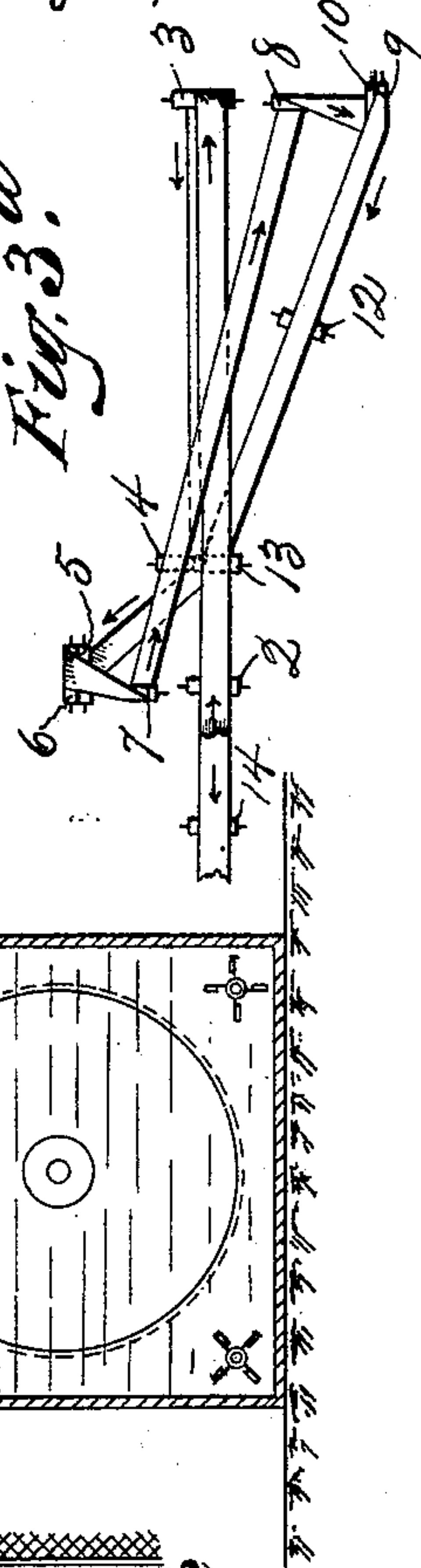


Fig. 5

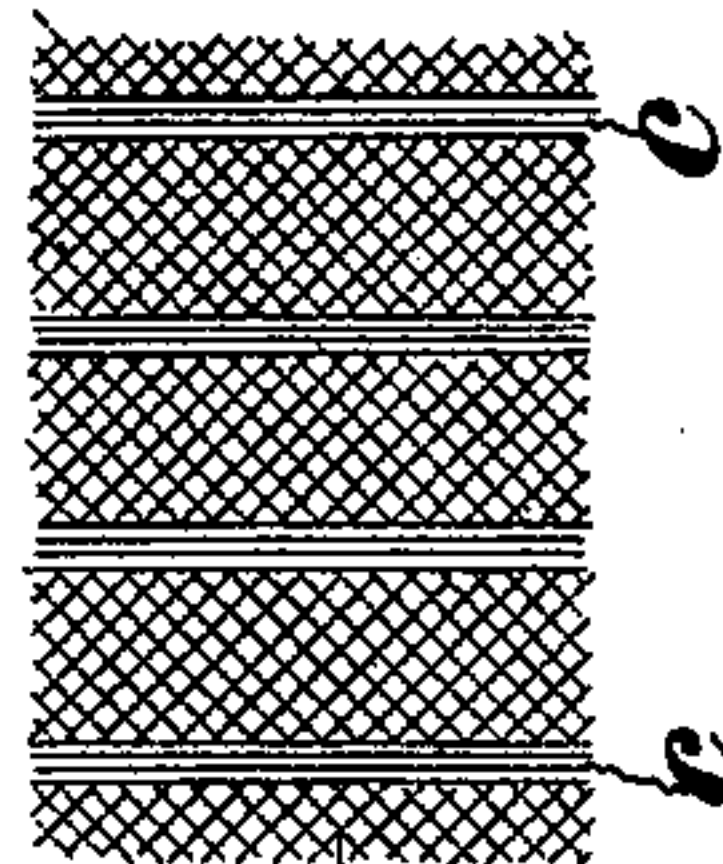
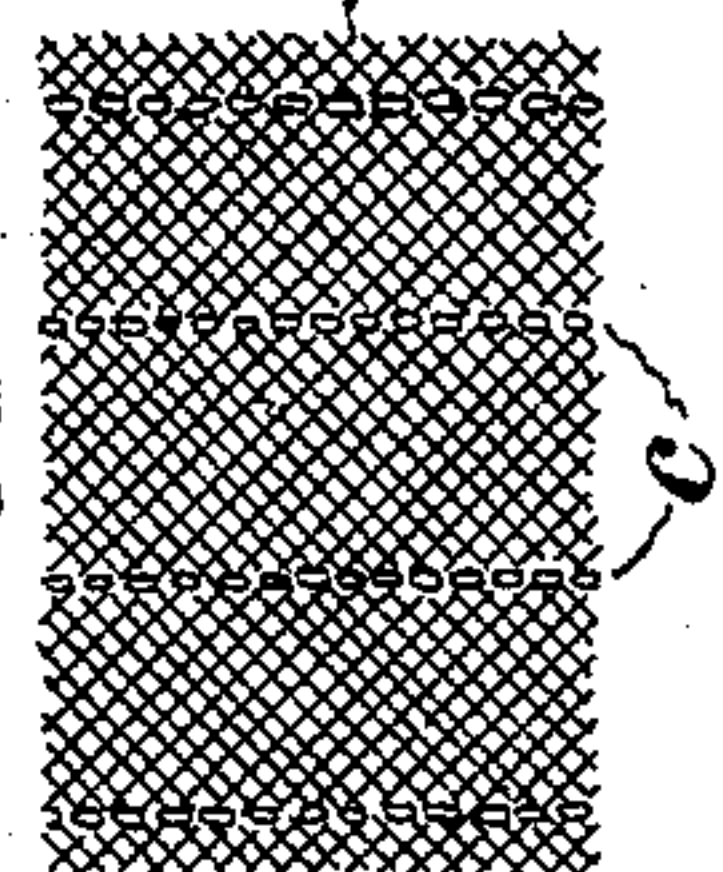


Fig. 4



Witnesses:
Henry Orth
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UNITED STATES PATENT OFFICE.

CARL KELLNER, OF VIENNA, AUSTRIA-HUNGARY.

APPARATUS FOR PREPARING CELLULOSE FOR MANUFACTURING SPUN FABRICS.

SPECIFICATION forming part of Letters Patent No. 603,333, dated May 3, 1898.

Application filed January 4, 1892. Serial No. 417,015. (No model.) Patented in Germany November 20, 1891, No. 73,601; in England November 20, 1891, No. 20,225; in Sweden November 20, 1891, No. 4,042; in Norway November 20, 1891, No. 2,509; in Austria-Hungary March 1, 1892, No. 54,382 and No. 85,064; in Switzerland December 27, 1892, No. 6,458, and in Canada August 18, 1893, No. 43,963.

To all whom it may concern:

Be it known that I, CARL KELLNER, a subject of the Emperor of Austria-Hungary, residing at Vienna, in the Province of Lower Austria, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Apparatus for the Preparation of Cellulose for the Manufacture of Spun Fabrics, (for which I have obtained Letters Patent in Austria-Hungary, No. 54,382 and No. 85,064, dated March 1, 1892; in Germany, No. 73,601, dated November 20, 1891; in England, No. 20,225, dated November 20, 1891; in Sweden, No. 4,042, dated November 20, 1891; in Norway, No. 2,509, dated November 20, 1891; in Switzerland, No. 6,458, dated December 27, 1892, and in Canada, No. 43,963, dated August 18, 1893;) and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters and figures of reference marked thereon, which form a part of this specification.

This invention has relation to the manufacture of thread or yarn for weaving purposes, or cord or twine from such short fibrous materials as cannot be readily spun by the ordinary process, and especially from such short fibers as cellulose.

In carrying out my invention the fibrous material is held in suspension in water in the proportion of from three hundred to five hundred parts of water to one of fibrous material, and in the use of cellulose excellent results are obtained with three parts of cellulose held in suspension in about one thousand parts of water. The fibrous material so held in suspension is next taken up by or deposited upon a foraminous cylinder in the form of a web, which is next rolled or rubbed into a roving suitable for spinning. The thickness of the roving thus obtained may in practice be readily varied within certain limits by regulating the thickness and width of the web to be rubbed or rolled into a roving.

In the manufacture of thread and the like from short fibers such as described I may mix

therewith longer fibers, either of vegetable or animal origin, as hair, cotton, flax, hemp, jute, ramie, esparto grass, or the like, either bleached or unbleached, dyed or in the natural state, fabrics woven from such thread or yarn being very soft, pliable, and strong, and cannot only be washed, but also printed upon.

The apparatus employed in the preparation of the fibrous material for spinning consists, essentially, of means for forming a web or sliver and means for rolling and rubbing such web or sliver into roving, such apparatus being shown in the accompanying drawings, in which—

Figure 1 is a longitudinal sectional elevation, and Fig. 2 a cross-sectional elevation, of a very simple construction of the apparatus. In Fig. 3, which is likewise a cross-sectional elevation, I have shown a modified take-up and rubbing arrangement in which the take-up device is constructed in the form of an endless belt so guided over pulleys that two belt portions are brought into contact with and made to cross each other for the purpose of rolling the fibrous material into a roving. Fig. 3^a is a fragmentary top plan view illustrating the arrangement of the take-up belt; and Figs. 4 and 5 show portions of the foraminous wire or endless apron having stopped off—i. e., non-foraminous—portions dividing the same into foraminous bands for the simultaneous formation of a plurality of narrow webs or slivers.

Referring to Figs. 1 and 2, M indicates a vat containing the fibrous material held in suspension in water through the agency of two revoluble stirrers *m' m'* at opposite ends and near the bottom of such vat. The vat M is provided with bearings for the journals of a take-up cylinder C, clothed with a wire fabric C', divided into circular bands by means of non-foraminous or substantially non-foraminous strips *c*, or, in other words, the wire C' has circular stopped-off places impermeable or substantially impermeable by water, so that the fibrous material will not be deposited thereon, whereby a number of webs or slivers are formed simultaneously on one and the same cylinder. As the cylinder re-

volves the web or webs or slivers of fibrous material are rubbed or rolled into a roving or rovings and caused to move over a suitable guide-roll R to a winding-roll B, on which the
 5 roving is wound, or instead of roll B a second guide-roll may be used and the roving wound directly on a bobbin B'.

The rubbing or rolling is effected, preferably, by two rolls r and r' , journaled in the
 10 arms of V-shaped bearings b , pivoted to hanger-rods b' . The two rolls r and r' are belted together by a belt b^2 and are revolved by a belt b^3 , belted to a pulley on the shaft or
 15 pulley p on an overhead shaft s .

A reciprocating movement in the plane of the axis of rotation of the cylinder C, whereby the webs are rolled or rubbed into rovings, is imparted to the rolls r and r' by an eccen-
 20 tric E and suitable connections between its strap and the bearing b for one of the rolls, or in any other desired manner.

The rolls r and r' not only serve to roll or rub the slivers into roving, but also perform
 25 in a measure the function of couching-rolls, and, as will be readily understood, the said slivers are made into rovings before they leave the wire. This may, however, be effected after such slivers leave the wire, as
 30 shown in Fig. 3, in which arrangement the wire-cloth for the cylinder C consists of an endless foraminous belt or wire C^2 , that nearly surrounds the said cylinder and travels therefrom in the direction of the arrows first over
 35 guide-rolls 2 and 3, then over guide-roll 4, and under guide-roll 5, which has its axis of rotation in a plane at right angles to that of rolls 2, 3, and 4. From roll 5 said wire travels over a parallel roll 6 and around rolls 7 and 8,
 40 which have their axes of rotation in planes that will cause that part of the wire guided thereby to cross the part of the wire traveling over rolls 2 3 at a more or less acute angle, as shown in Fig. 3^a, whereby the sliver
 45 or slivers of fiber F (shown in dotted lines in Fig. 3) is or are rolled into a roving and at the same time caused to move between the two wires to a reel or bobbin or bobbins B, suitably placed, on which such roving or rovings
 50 is or are wound. From the roll 8 the wire travels around the parallel rolls 9 and 10, thence alternately over and under the guide-rolls 12, 13, and 14, whose axes of rotation are parallel with those of rolls 2 and 3, and back
 55 to cylinder C, proximate to the point at which the wire leaves said cylinder, as shown.

Of course a number of endless wires C^2 may be employed on the same cylinder and in conjunction with one and the same set of carrier
 60 and guide rolls, or a set of such can be used

for each wire, which latter will be of such a width as to produce a sliver or web of the desired width.

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

1. The combination with a vat for holding fibrous material in suspension in water, and a cylinder revoluble in said vat and surrounded by a foraminous fabric kept in motion by
 70 such cylinder, of means coöperating with said fabric for rolling or rubbing the fiber deposited thereon into roving, for the purpose set forth.

2. The combination with a vat for holding
 75 fibrous material in suspension in water, and a cylinder revoluble in said vat and surrounded by a fabric composed of continuous foraminous and like non-foraminous or substantially non-foraminous portions kept in motion by
 80 said cylinder, and means coöperating with said fabric for rolling or rubbing the fibrous material deposited on the foraminous portions of said fabric into rovings, for the purpose set forth.

3. The combination with a vat for holding fibrous material in suspension in water, a cylinder revoluble in said vat and clothed with a foraminous fabric; of means coöperating
 90 with said cylinder for rolling or rubbing the fibers deposited thereon into roving, for the purpose set forth.

4. The combination with a vat for holding fibrous material in suspension in water, a cylinder revoluble in said vat and clothed with
 95 a foraminous fabric; of one or more rolls adapted to reciprocate in the plane of the axis of rotation of said cylinder and coöperating therewith to roll the fibrous material into a roving, and means for reciprocating said roll
 100 or rolls, substantially as and for the purpose set forth.

5. The combination with a vat for holding fibrous material in suspension in water, a cylinder revoluble in said vat and clothed with
 105 a foraminous fabric; of one or more rolls adapted to reciprocate in the plane of the axis of rotation of said cylinder and coöperating therewith to roll the fibrous material into a roving, and means for revolving and reciprocating said roll or rolls independently of said
 110 cylinder, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CARL KELLNER.

Witnesses:

JULIUS GOLDSCHMIDT,
 A. SCHLESSING.