

(No Model.)

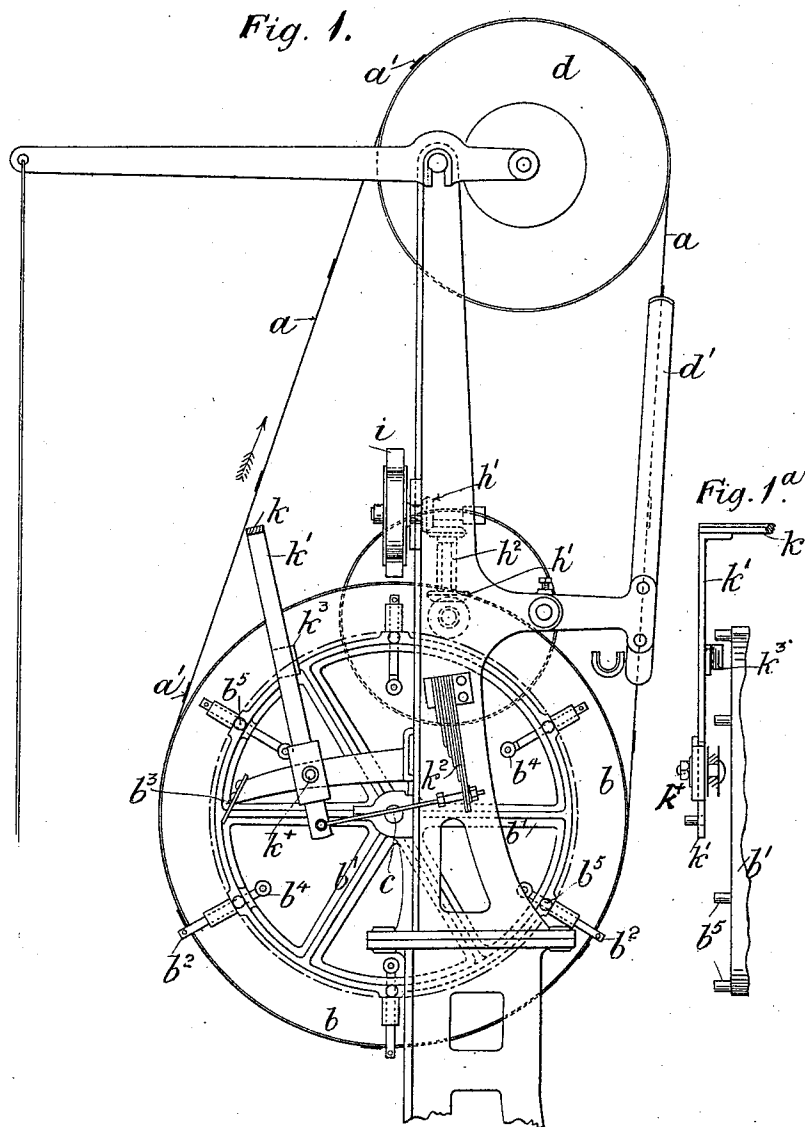
2 Sheets—Sheet 1.

W. BIRCH.

APPARATUS FOR SEPARATING SOLID OR SEMISOLID SUBSTANCES FROM
SLUDGE OR OTHER FLUID OR SEMIFLUID MATTERS.

No. 582,519.

Patented May 11, 1897.



WITNESSES

Geo. C. Abby.
Louis Wenke

INVENTOR

William Birch
by his attorneys
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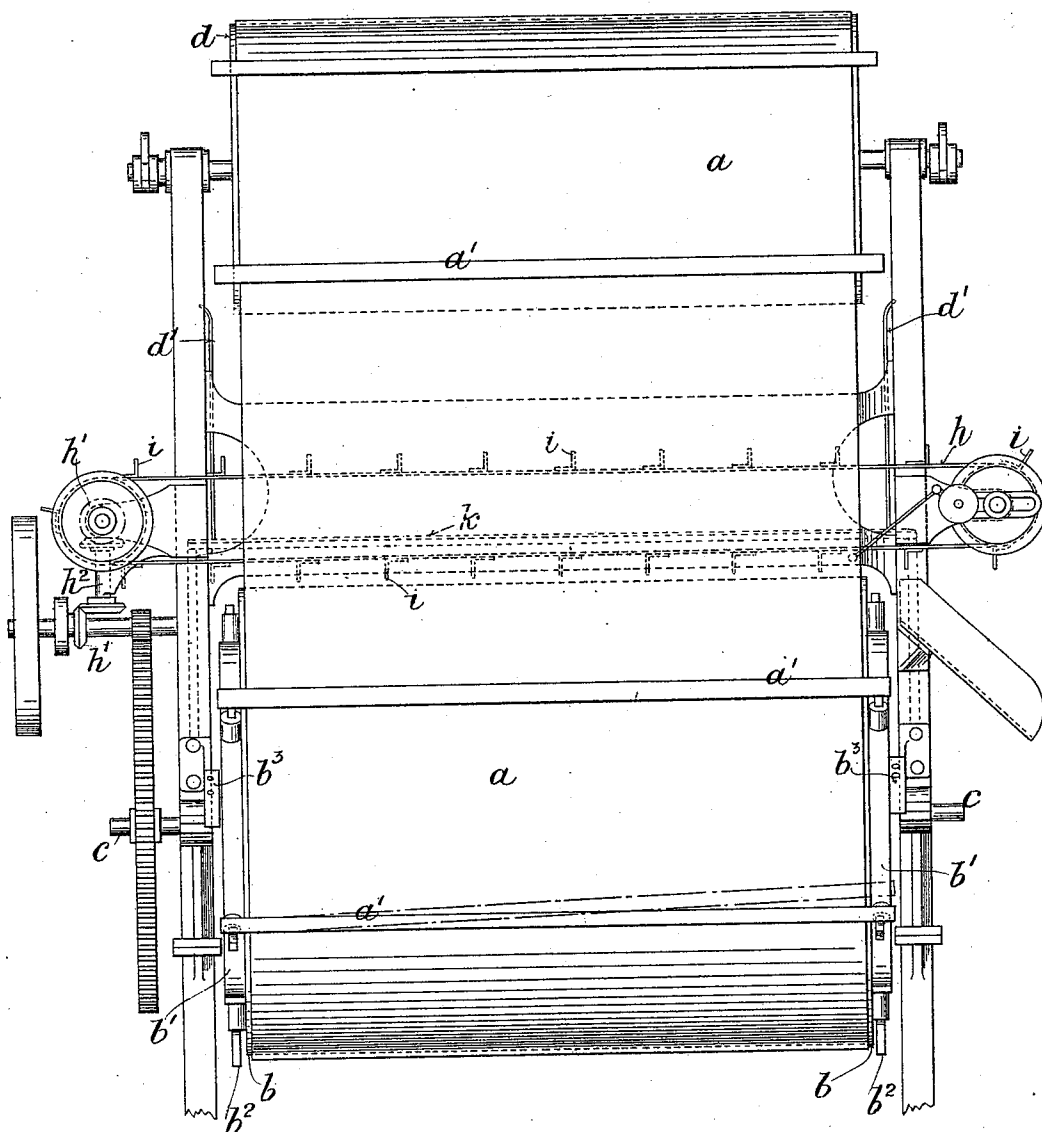
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Fig. 2.



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UNITED STATES PATENT OFFICE.

WILLIAM BIRCH, OF MANCHESTER, ENGLAND.

APPARATUS FOR SEPARATING SOLID OR SEMISOLID SUBSTANCES FROM SLUDGE OR OTHER FLUID OR SEMIFLUID MATTERS.

SPECIFICATION forming part of Letters Patent No. 582,519, dated May 11, 1897.

Application filed May 19, 1896. Serial No. 592,220. (No model.)

To all whom it may concern.

Be it known that I, WILLIAM BIRCH, a subject of the Queen of Great Britain, residing at Lower Broughton, Manchester, in the county of Lancaster, England, have invented Improved Apparatus for Separating Solid or Semisolid Substances from Sludge or other Fluid or Semifluid Matters, of which the following is a specification.

10 This invention relates to improvements upon the apparatus for which Letters Patent No. 514,300 were granted to me in the United States of America, dated February 6, 1894, for separating solid or semisolid substances from sludge or other fluid or semifluid mat-
15 ters; and the principal objects of my present invention are to dispense with the angular guide-rollers described in the above specification, to provide simple and effective means
20 for counteracting the tendency of the endless pressing and filtering band employed therein from running to and over the edge of the drum which expresses the fluid from the sludge between it and the said band, such
25 tendency arising from the unavoidably uneven diameter formed across the width of fabric by the sludge as it is being pressed, and, further, to shake off any solid matter adhering to the pressing and filtering band, so that
30 little or no such solid matter is carried up over the tension-roller and the band is kept porous.

My invention will be readily understood from the following description on reference
35 to the annexed drawings, of which—

Figure 1 is a front elevation, and Fig. 2 a side elevation, of so much of my apparatus as is necessary to illustrate the present invention. Fig. 1^a is a detached face view of
40 a portion of the striking mechanism, hereinafter more particularly referred to.

According to this invention I mount the pressing-drum *b* loosely on its axle *c*, and I fasten squarely across the filtering-band *a*
45 a series of transverse laths *a'* of suitable strength, made of lancewood or other similar resilient material and of sufficient width to be rigid edgewise. The ends of these laths *a'* project beyond the edges of the band *a* and
50 of the sludge-pressing drum *b*, at either end of which is a wheel or pulley *b'*, keyed on the

axle *c* of the pressing-drum and carrying a series of sliding rods *b²* or catches, projecting therefrom so as to act in turn, as hereinafter described, against the underneath edge of one
55 of the above-described laths *a'* and carry the band *a* and the pressing-drum *b* with it as the wheel or pulley *b'* rotates with its shaft *c* until the sliding rod or catch *b²* is withdrawn from the lath by means of a fixed incline *b³*
60 acting against bowls *b⁴* on the rods or catches *b²*, or other equivalent means. These rods or catches *b²* return by their own weight as they rotate into position to act against the
65 laths, or they may be returned into such position by springs or otherwise.

The rods or catches *b²* are set in corresponding positions on pulleys *b'* at either end of the pressing-drum *b*, as seen at Fig. 2, so that when the filtering-band *a* is straight the
70 laths *a'* are driven from both ends; but if one edge of the band *a* runs at all in advance of the other the laths *a'* are inclined, as seen dotted on Fig. 2, and the hinder end of each lath *a'* is driven by its catch-wheel, and by
75 this means the laths *a'* will be gradually worked straight again, thereby counteracting any uneven action of the filter-band *a*.

The laths *a'* as they are passing back from the tension-roller *d* to the pressing-drum *b*
80 are guided between fixed plates *d'*, (see Fig. 2,) which in guiding the ends of the laths *a'* serve to keep the cloth *a* in place upon the pressing-drum *b*.

I furthermore drive the endless band *h*,
85 carrying the scrapers *i*, which passes across the upper surface of the sludge-pressing drum *b*, by means of bevel or miter wheels *h'* on a vertical shaft *h²*, similarly driven from the main driving-shaft *c*, and I thus obtain a
90 rapid continuous motion of the said scrapers *i*.

In order to shake off any solid matter adhering to the filtering-band *a* after it leaves the pressing-drum *b* and to prevent such solid matter from passing over the tension roller
95 or drum *d* and retain the porosity of the band *a*, I use a transverse bar *k*, held close to the said band *a* by levers *k'* and springs *k²* and caused to strike the said band *a* by pegs, bowls, or fingers *b⁵*, projecting from the wheels
100 *b'* and acting against projections *k³* on the levers *k'* to withdraw the bar *k*. The fulcrum of

the levers k' are at k^x , and the projections k^s are left by the pegs, bowls, or fingers b^s as the wheels b' rotate and the springs k^2 bring the bar k into forcible contact with the band a ,
 5 thereby causing any solid matter adhering to the latter to be shaken therefrom and to fall back upon the drum b for removal by the scrapers i .

I claim as my invention—

10 1. The combination of an endless filtering-band, with laths secured thereto and projecting beyond the edges thereof, a pressing-drum, wheels or pulleys carrying catches at either side of the drum to act on the said laths, sub-
 15 stantially as and for the purpose set forth.

2. The combination of an endless filtering-band, with laths secured thereto and projecting beyond the edges thereof, a pressing-drum and wheels or pulleys at either side of the
 20 pressing-drum, the said wheels carrying sliding catches to act on the said laths, substantially as and for the purposes set forth.

3. The combination of the endless filtering-band having laths secured thereto and pro-
 25 jecting beyond the edge thereof, and a press-

ing-drum, with guide-plates for the said laths, substantially as and for the purpose set forth.

4. The combination of a pressing-drum and endless filtering-band, with an endless chain
 30 of scrapers, a main driving-shaft and means for imparting to the scrapers from the main driving-shaft, a rapid continuous motion, substantially as set forth.

5. The combination of a pressing-drum and an endless pressing and filtering band coop-
 35 erating with the drum to express the fluid from the sludge between the drum and band, with means for shaking off, back onto the drum, the solid matter adhering to the pressing and filtering band as it leaves the press-
 40 ing-drum, substantially as and for the purposes set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM BIRCH.

Witnesses:

CHARLES A. DAVIES,
 JNO. HUGHES.