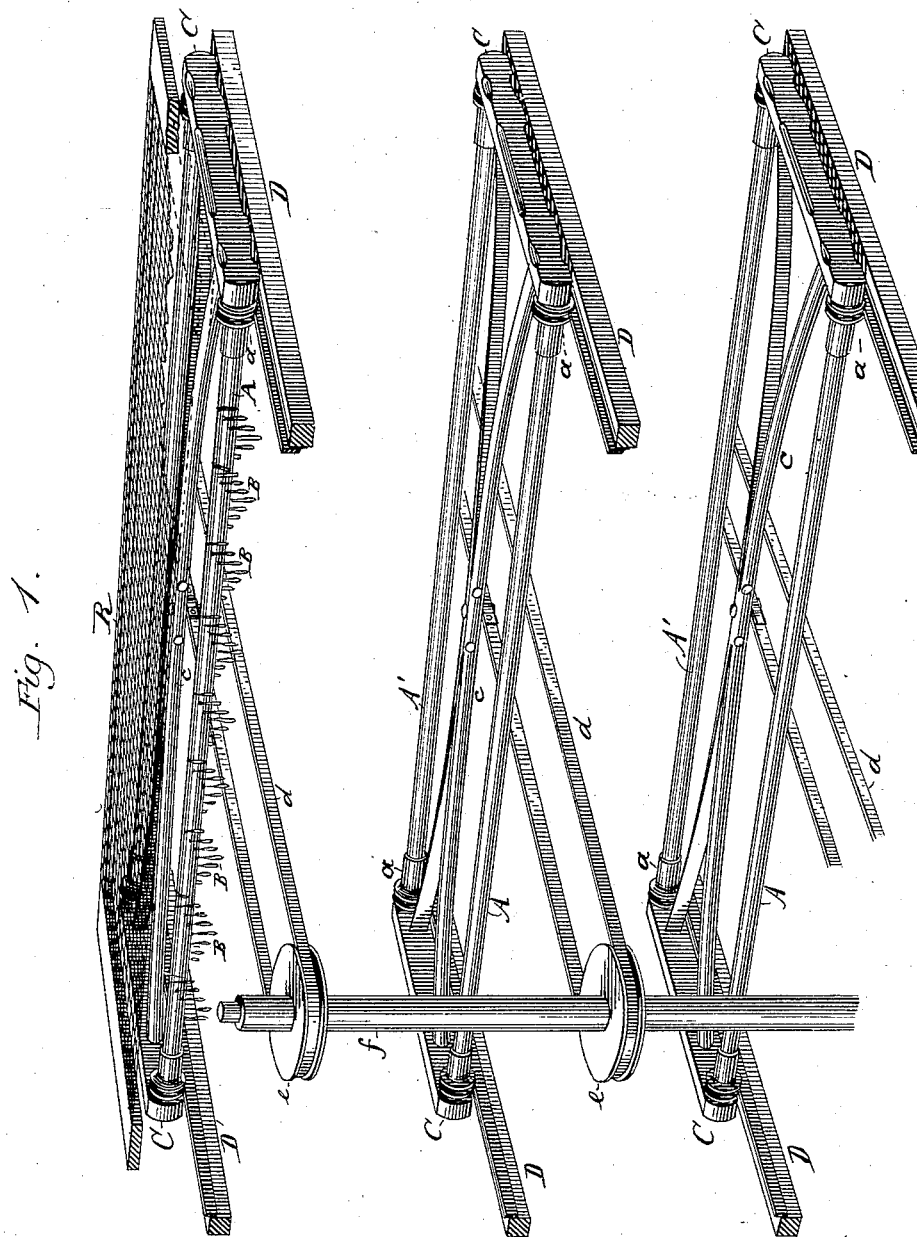


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MIDDLINGS PURIFIER.

No. 266,985.

Patented Nov. 7, 1882.



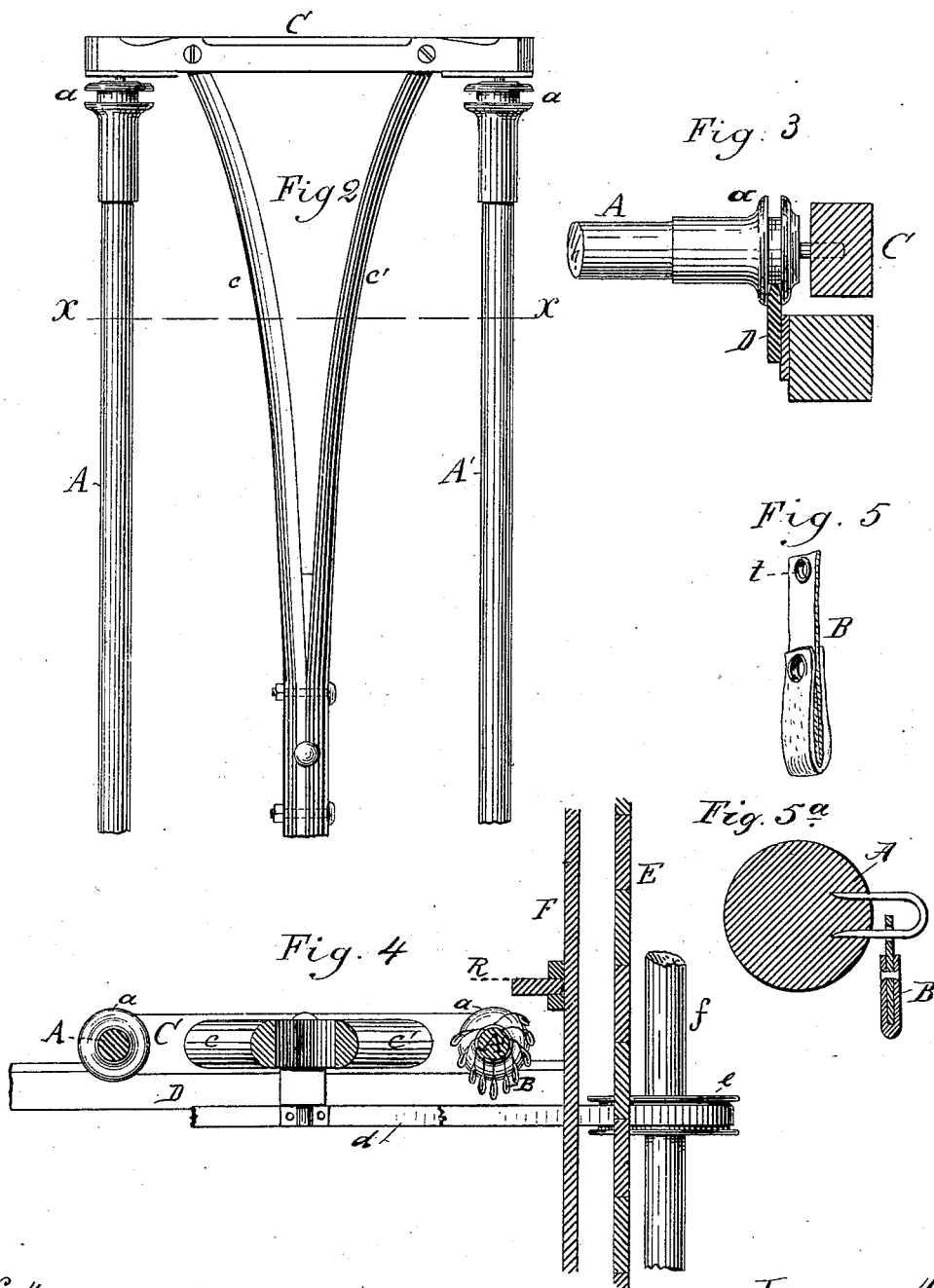
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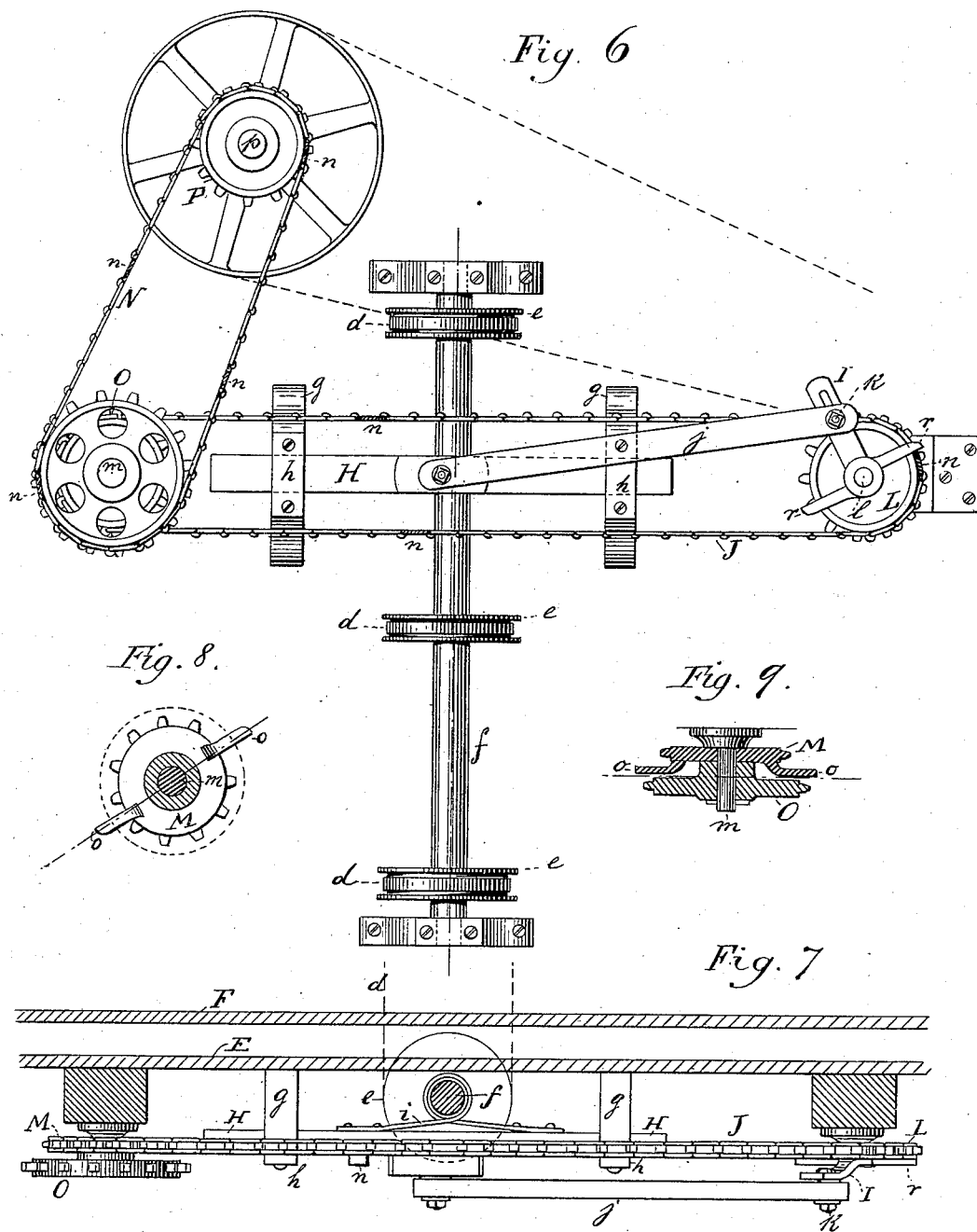
Witnesses:
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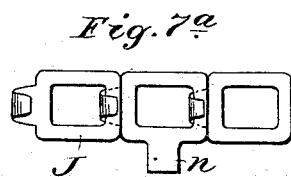
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UNITED STATES PATENT OFFICE.

LOUIS GATHMANN, OF CHICAGO, ILLINOIS.

MIDDLINGS-PURIFIER.

SPECIFICATION forming part of Letters Patent No. 266,985, dated November 7, 1882.

Application filed July 31, 1882. (No model.)

To all whom it may concern:

Be it known that I, LOUIS GATHMANN, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Middlings-Purifiers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

This invention relates to devices for automatically cleaning the screens in separators, and especially to that class of such cleaners having centrifugal beaters like the one described in Letters Patent No. 227,882, granted to J. W. Collins on May 25, 1880; and it is my object to produce a device which for the intended purpose is simple in its construction and effective in its operation, and is more particularly designed to be applied to the middlings-purifier described in Reissued Letters Patent No. 8,929, granted to me on October 14, 1879.

My invention therefore consists of the novel construction and arrangement of the beater-shafts, and in the mechanism for automatically imparting an intermittent simultaneously rotating and reciprocating motion to such beater-shafts, all as hereinafter will be described and specifically claimed.

In the accompanying drawings, Figure 1 represents a perspective view of three pairs of beater-shafts as applied to my middlings-purifier for simultaneously cleaning the three screens that are arranged one above the other in the shoe or riddle of the machine. Fig. 2 represents a plan view of one end of a pair of beater-shafts with their connecting-frame. Fig. 3 is a sectional elevation of one end of a beater-shaft, its connecting-frame, and track-rail. Fig. 4 is a sectional elevation on line *x* in Fig. 2. Fig. 5 is a perspective view of one of the leather beaters. Fig. 5^a represents a cross-section of the beater-shaft, showing the attachment of one of the beaters by means of a staple. Fig. 6 represents a side elevation of the mechanism for reciprocating the beater-shafts; Fig. 7, a sectional plan view of the same. Fig. 7^a shows a plan of a piece of the chain and one of the projecting lugs attached thereto; Fig. 8, an elevation of the sprocket-wheel that is driven intermittently from the

feed-roller shaft; and Fig. 9, a cross-section of the two sprocket-wheels for the driving-chains, one of which has a continuous and the other an intermittent movement.

Corresponding letters in the several figures of the drawings designate like parts.

A and A' denote two shafts, preferably made of wood, and with their ends inserted into the socketed hubs of grooved or flanged wheels *a*, each of said wheels having a gudgeon. Upon such shafts A, I attach, by means of small staples, a series of beaters, B, so as to be distributed at equal distance apart and on a spiral line over the entire surface of such shaft. The beaters B, I form each of a strip of soft leather having a metal eyelet, *t*, to one end, through which the staple is passed that pivotally connects it to the shaft. The opposite end of this leather strip I double up, place around it another leather strip, and secure together the four thicknesses of leather by a rivet. A beater thus constructed combines great flexibility and elasticity with sufficient gravity at its end, and is very durable in use. The shafts A A' are journaled between the ends of two bars, C, which bars again are connected by two brace-bars, *c* and *c'*, which are curved and secured together in their middle by carriage-bolts in a manner that such a brace-connection is shaped like the letter X.

The grooved or flanged wheels *a* ride upon rails D, that are framed laterally between the side walls, E, of the machine in a manner to clear the riddle or shoe F, and the frames C *c* are reciprocated from side to side of the machine, each by an endless belt, *d*, which is stretched over two pulleys, *e*, and one side of which is coupled to the center of braces *c c'*. The three pulleys *e* for the three sets of shafts A are mounted upon a vertical shaft, *f*, and such a shaft *f* is journaled in suitable bearings exteriorly against each side of the machine-frame, with the belt *d* passing through such frame, and these belts are tacked or otherwise secured to the rims of the pulleys *e* at one point to prevent slipping, and thereby to determine the exact extent of the movement of the shafts A by the oscillation of the shafts *f*. The frames C *c* being pulled from one side to the other in the machine, the flanged wheels *a*, carrying the weight of the shaft A and of frames C *c*, will be guided and roll upon the

rails D with sufficient traction to cause the shafts A A' to be rotated during the time such frames C c are being reciprocated, whereby the beaters B will be thrown out radially by centrifugal force, and will strike the screens G above with just sufficient force for dislodging any obstructions from the meshes of the same. When the shafts A are at rest flexible beaters B hang out of contact with the screens G. The vertical shaft *f*, which by pulleys *e* and belts *d* imparts an intermittent reciprocating motion to the shafts A, is oscillated from a reciprocating bar, H, which is guided in blocks *g*, that are secured against the purifier-frame, and are provided each with a cap-plate, *h*, by a belt, *i*, that is secured to and is wound once or twice around such shaft *f*, and the ends of such belt are made rigid with the bar H. This bar H has pivotally coupled to its center a pitman, *j*, which connects with a slotted crank, I, by an adjustable crank-pin *k*. The hub of crank I is sleeved upon a stud, *l*, that is secured against the forward end of the side frame of the purifier, and such hub has two radial arms, *r*, which are diametrically opposite and rectangular with crank I. A sprocket-wheel, L, is journaled on stud *l*, behind crank I, and a sprocket-wheel, M, of equal size with wheel L, is journaled upon a stud, *m*, at or near the opposite end of the side frame. An endless chain, J, is stretched over both sprocket-wheels L and M, which chain is to have a number of links of which the number of teeth of sprocket-wheel L or M is a submultiple. One or more links of chain J have projecting lugs *n*, that will engage with one or the other arm *r* of crank I, and will rotate such crank a semi-revolution, whereby the bar H is shifted from one extreme end to the other of its stroke, and is allowed to remain in that position until the opposite arm *r*, that is brought in position for the next chain-lug *n* to engage with and turn the crank another semi-revolution, will shift such bar H to its extreme opposite position again, thus bringing about a reciprocating movement of bar H with a certain period of rest after each reciprocation, which time of idleness can be varied by attaching the link-lugs farther apart or closer together.

The sprocket-wheels L and M may be either continuously rotated or they may be rotated at intervals, which latter movement, for the reason hereinafter explained, I prefer to apply, and for that purpose I provide the sprocket-wheel M on its front face with two diametrically-opposite arms, O, that will alternately engage with projecting side lugs, *n*, of an endless chain, N, which is stretched over a sprocket-wheel, O, that is pivoted upon stud *m*, in front of sprocket-wheel M, and over a sprocket-wheel, P, that is rigidly mounted upon the feed-roller shaft *p* of the middlings-purifier. This arrangement, as will be seen, assists in regulating the number of reciprocations per minute that I wish to give to the shafts A and A', by enabling me to insert into the chain N

as many links having lugs *n* as I intend to have, while in chain J, I am restricted to a certain number of lugs only, which should be an equal number or a multiple of such number of links apart as the sprocket-wheels L and M have teeth. The stud *m*, I prefer to secure to the machine-frame in a manner that it can be longitudinally and vertically adjusted for taking up any slack of chains J and N.

The operation of the device is as follows, to wit: The endless chain N, that is stretched over sprocket-wheels P and O, being continuously in motion while the purifier is running, the projecting lugs *n* of such chain N will engage alternately with one or the other arm *o* of sprocket-wheel M, whereby each lug *n* will rotate such wheel M a semi-revolution before it can disengage, and only after it has moved the opposite arm *o* into position to engage with the next lug *n*, that will again rotate such wheel a semi-revolution, and the distance such lugs *n* are set apart will determine the time of rest between each two semi-revolutions of such sprocket-wheels M. The intermittent rotating movements of wheel M being transmitted by chain J to sprocket-wheel L, the projecting lugs *n* of such chain J will be brought at longer intervals in contact with one of the arms *r* of crank I, whereby a semi-revolution is imparted to such crank, which will shift the bar H its entire stroke in one direction, and then again with the next semi-revolution in the opposite direction. The reciprocation of this bar H, through its connection by belt *i* with upright shaft *f*, will rotate such shaft *f* and pulleys *e*, when the belts *d*, stretched over such pulleys and coupled to frame C c, will pull the beater-shafts A A' from one side of the machine to the other side, and will cause them to be rotated by the traction of their flanged end wheels upon the rails D, when by the centrifugal force the beaters B are thrown out radially and will deliver against the under side of the screens R rapid light blows, which are so gentle as scarcely to disturb the mass of middlings on top, and yet with sufficient force to not only clean the cloth, but also to dislodge the irregular sharp-pointed middlings which become wedged in the meshes, and would otherwise seriously curtail the capacity of the screens.

The mechanism, as will be seen, for moving the beaters backward and forward across the machine is very simple and effective, and can be regulated by the miller to move more or less frequently, as he desires, by inserting in the chain more or fewer of the links provided with projecting lugs *n*.

What I claim is—

1. In a middlings-purifier, the combination of a screen, a wooden shaft or shafts arranged to revolve in proximity thereto, a series of beaters, B, made of flexible material, each constructed with a metal eyelet, *t*, and staples adapted to secure said beaters upon said shafts, substantially as described and shown.

2. The combination of flexible beaters B,

shafts A A', bars C C, connecting brace-bars c c', grooved or flanged end wheels, a, and guide-rails D, all substantially as and for the purpose set forth.

5 3. The combination of the flexible beaters B, shafts A A', grooved or flanged end wheels, a, guide-rails D, endless belt d, pulleys e, and oscillating shafts f, substantially as described, to operate as specified.

10 4. The combination of shafts A A', flexible beaters B, frames C c c', guide-rails D, endless belts d, pulleys e, upright shafts f, strap or belt i, and reciprocating bar H, all constructed and arranged substantially as described and

15 shown.
5. The combination, with screen R, a cloth-cleaner frame below said screen, oscillating shaft f, pulley e, belt i, and bar H, of pitman j, crank I, constructed with arms r r, sprocket-
20 wheels L M, and endless chain J, constructed with lugs n, substantially as set forth.

6. The combination, with the screen, the cloth-cleaners arranged to reciprocate thereunder, the sliding bar H, and means for trans-

mitting motion from said bar to said cleaners, 25
of pitman j, crank I, having arms r, sprocket-wheels L M, and chain J, constructed with lugs n, adapted to engage alternately the arms r r, all constructed and arranged substantially as set forth.

7. The combination, with reciprocating 30
frames C c c', of shaft f, sliding bar H, adapted to impart oscillation thereto, pitman j, crank I, having arms r r, sprocket-wheels L and M, the latter having projections o, endless chain 35
J, having lugs n, adapted to engage arms r r, sprocket-wheels O P, and endless chain N, having lugs n, the whole being constructed and arranged substantially as set forth, to operate as specified.

40
In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

LOUIS GATHMANN.

Witnesses:

EDWARD WESTLAKE,
RICHARD G. SCHMID.