

No. 680,514.

Patented Aug. 13, 1901.

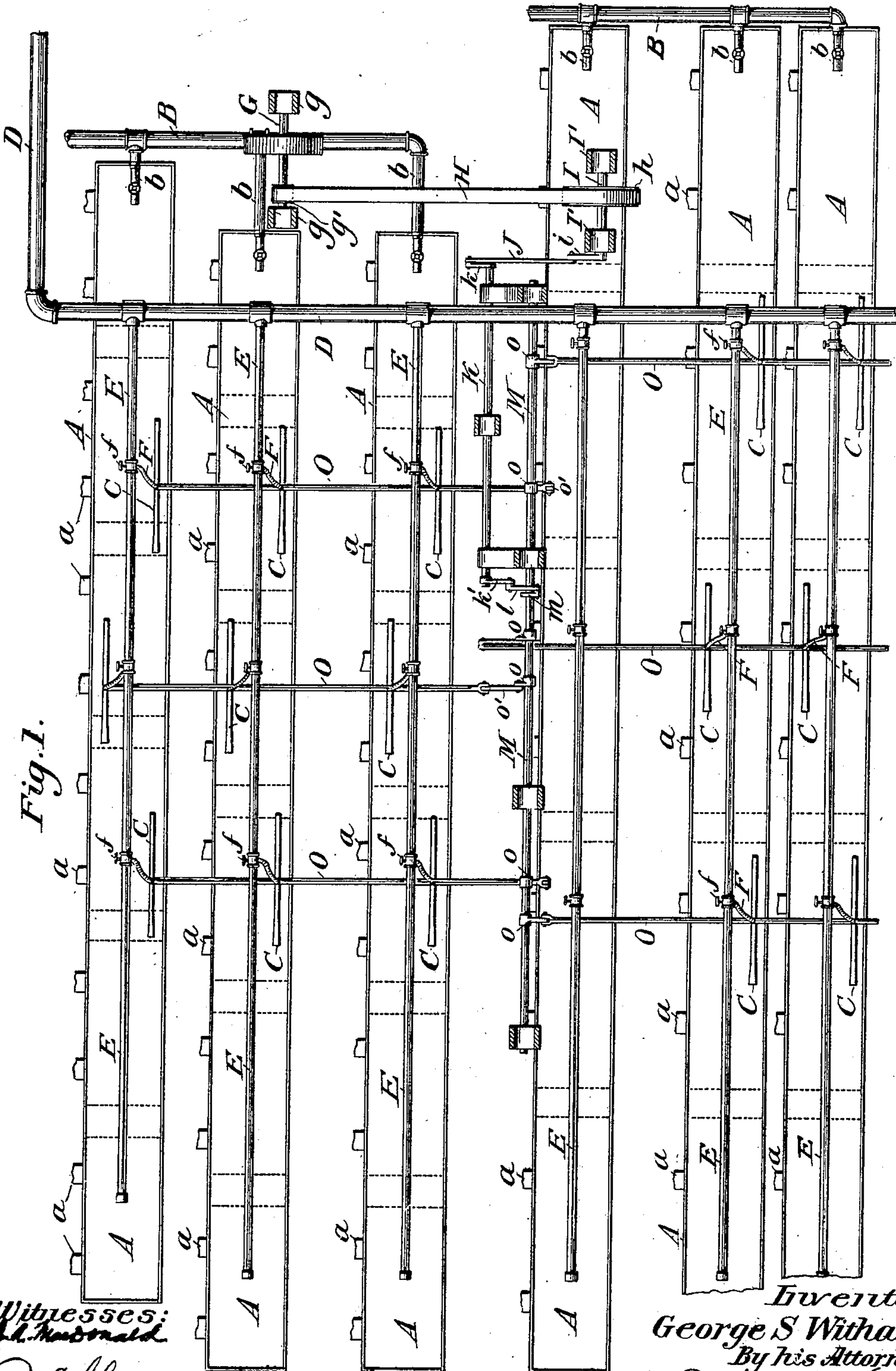
G. S. WITHAM.
CLEANER FOR PAPER PULP SCREENS.

(Application filed May 25, 1901.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



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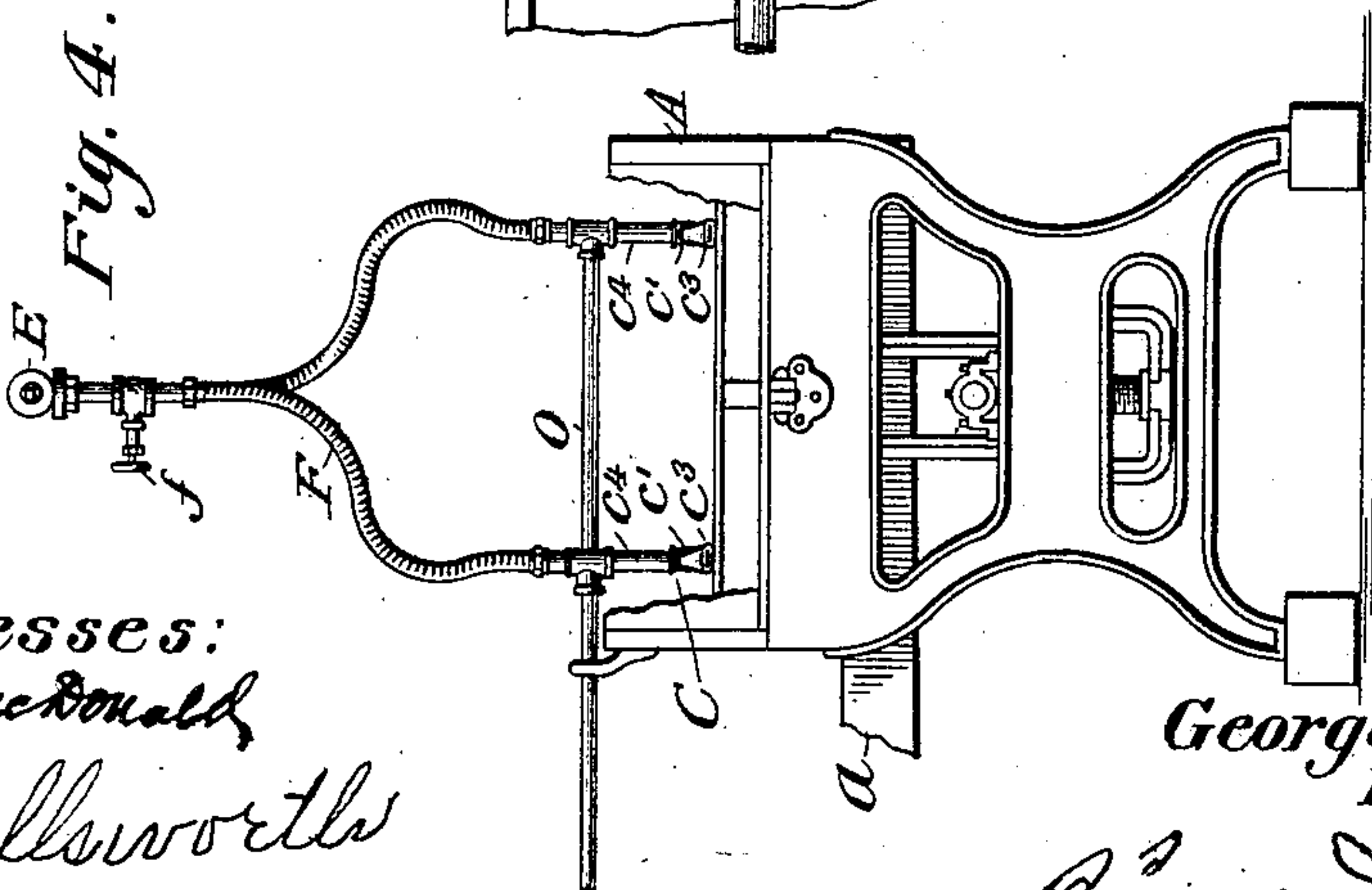
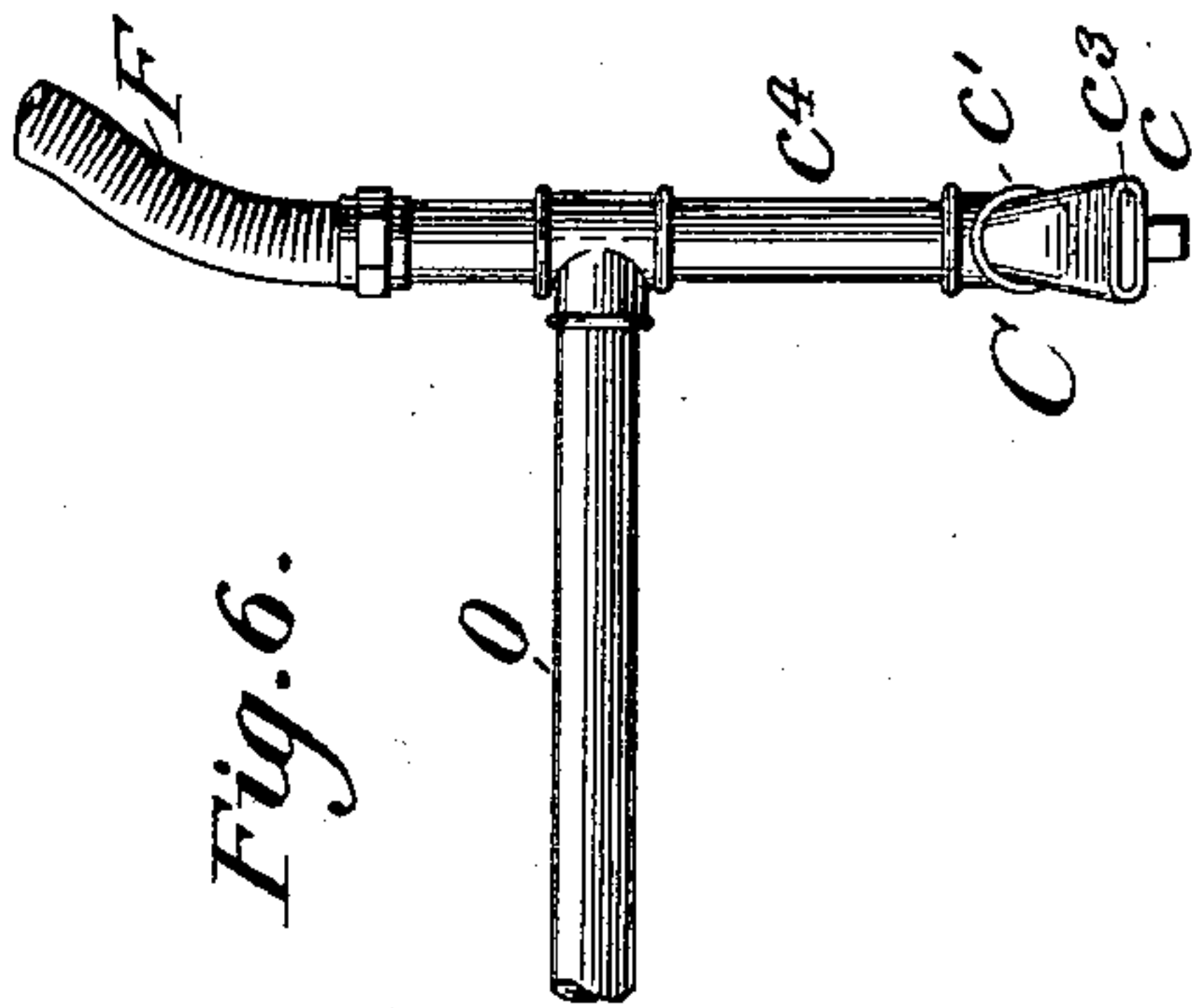
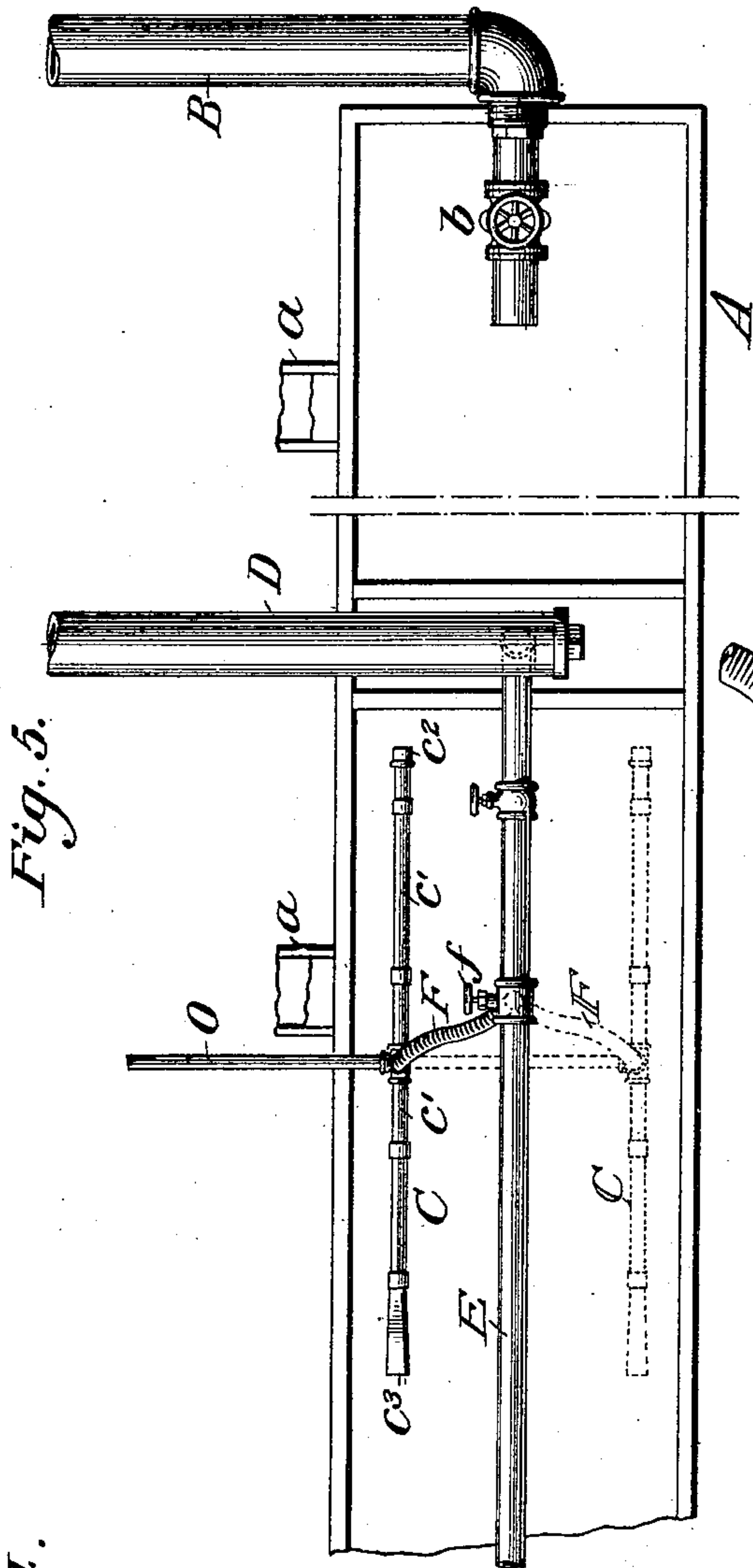
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CLEANER FOR PAPER PULP SCREENS.

(Application filed May 25, 1901.)

(No Model.)

3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

GEORGE S. WITHAM, OF MADISON, MAINE.

CLEANER FOR PAPER-PULP SCREENS.

SPECIFICATION forming part of Letters Patent No. 680,514, dated August 13, 1901.

Application filed May 25, 1901. Serial No. 61,881. (No model.)

To all whom it may concern:

Be it known that I, GEORGE S. WITHAM, a citizen of the United States, residing at Madison, in the county of Somerset and State of Maine, have invented certain new and useful Improvements in Cleaners for Paper-Pulp Screens, of which the following is a specification.

My invention relates to that class of apparatus used in the manufacture of paper-pulp which dresses or refines the pulp by passing it over screens, whereby the chips, knots, bark, slivers, and other coarse pieces of the stock are separated.

It relates particularly to means for scraping or cleaning the screen-plates, whereby the meshes of the screens are kept open during the operation of screening.

In carrying out my invention I provide scrapers which traverse the upper surfaces of the screens and dislodge the knots, chips, &c., and in connection with the scrapers I employ jets or streams of water, which are so directed as to keep the pulp agitated and promote the flow of the pulp from the supply to the discharge end of the screens. I employ novel means for operating the scrapers and for supplying water to them, and have also improved the general construction and organization of the apparatus and certain of the details of construction, which will be hereinafter described.

In the accompanying drawings, Figure 1 is a plan view of a series of pulp-screens with my improvement applied. Fig. 2 is an end view, on an enlarged scale, of the apparatus shown in Fig. 1. Fig. 3 is a detail view, on an enlarged scale, of one of the scrapers provided with devices for supplying a stream or jet of water to act in connection with the scraper. Fig. 4 is an end view of one of the screens with my improvements applied. Fig. 5 is a top plan view of the supply end of one of the screens equipped with my improved scraping or cleaning apparatus. Fig. 6 is a detail view showing the discharge end of the water-pipe carried by the scraper and showing also the manner in which water is supplied to this pipe and the manner in which the scraper is connected with its actuating mechanism.

In Figs. 1 and 2 I have shown a series of six screens A, provided with my improved scrapers, which latter are connected with mechanism by which they may be simultaneously operated from a single driving-shaft. The particular construction of the screens forms no part of my present invention. The screen-plates may be of usual construction and mounted in the usual way. The unscreened pulp is supplied to the screens by pipes B, having branches *b*, and the strained pulp may pass out by the lateral discharge-pipes *a*. The fine-mesh screen-plates should be located at the supply end of the apparatus, and the coarse-mesh plates at the lower or discharge end of the apparatus.

Each scraper C consists of a bar *c*, preferably of wood, and the lower end of which is adapted to bear upon and slide over the top of the screen-plates in a direction transverse to the length of the screen. At the top of each scraper-bar *c* is secured a pipe *c'*, closed at one end *c²* and open at its opposite end *c³*. This end of the pipe is bent downwardly and flattened, as shown in Figs. 3 and 6, in order to deliver a wide jet or stream of water close to the surface of the screens. Each pipe *c* is provided with an upwardly-extending branch *c⁴*, which is connected with a water-supply pipe and with an operating-rod in the manner presently to be described.

As will be observed by reference to Fig. 1, the screens A are arranged parallel side by side, and the scrapers are operated by mechanism which causes them to reciprocate back and forth transversely across the plates, one set of scrapers moving in one direction while the next set move in the opposite direction, water being simultaneously supplied to all the scrapers and discharged toward the lower ends of the screens while the scrapers, with their pipes, are traversing the screens transversely.

The water for supplying the water-discharge pipes of the scrapers is conveyed through a pipe D, to which is connected a series of pipes E, extending longitudinally above the screen. The pipe *c⁴* of each scraper is connected with one of the pipes E by a flexible pipe or hose F, each such connection being preferably provided with a valve *f*.

Other valves may be used in the water-supply system wherever desired to control the distribution of water.

Any suitable means may be employed for reciprocating the scrapers; but preferably the mechanism should be so arranged as to cause the scrapers to move alternately in opposite directions, as above stated. The particular mechanism which I have illustrated is constructed and operated as follows: A driving-shaft G is mounted in bearing-brackets *g*, and a pulley *g'* on this shaft is connected by means of a belt H with a pulley *h* on a counter-shaft I, mounted in brackets I'. This shaft is provided with a crank-arm *i*, connected by means of a link J with a crank-arm *k* on a shaft K, mounted in the bearings in brackets K'. A crank-arm *k'* on the opposite end of this shaft is connected by means of a link *l* with a crank *m* on the shaft M, which may be mounted with bearings in any suitable way. This shaft is provided with a series of crank-arms *o*, which are connected by links *o'* with rods or pipes O, that are secured to the branches *c*⁴, projecting upwardly from the scrapers. Preferably I employ piping for connecting the scrapers with the operating-shaft M, and the pipes may be connected with the branches *c*⁴ in the manner indicated in Figs. 3 and 6, care being taken not to obstruct the passages for water through the branch pipes *c*⁴ to the water-discharge pipes *c'*. As illustrated, each connection O operates three scrapers; but a less or greater number may be operated by each connection O.

I do not find it necessary to arrange scrapers from end to end of the screens. They are preferably arranged at the upper ends only of the screens. By this organization of apparatus the scrapers are operated simultaneously from a single driving-shaft. They are made to reciprocate transversely across the screen, and the water supplied to the scrapers sweeps the screen-plates from side to side as the scrapers travel back and forth. The pulp is kept well stirred up and is driven toward the coarse screens at the lower end of the apparatus, where the coarse particles—such as slivers, knots, bark, &c.—are removed, while the less coarse pulp goes through the coarse meshes of the plates and may be run out to a separate wet machine, which makes it possible to separate the dirty pulp from the clean.

So far as I am aware jets of water have not heretofore been employed in connection with

scrapers to keep the pulp moving in the right direction while the scraping operation is being performed.

I claim as my invention—

1. The combination of the screens, the scrapers, and water-discharge pipes discharging at the ends of the scrapers in line with the flow of the pulp.

2. The combination of the scrapers, and water-discharge pipes carried by and moving with the scrapers and discharging at the ends of the scrapers in line with the flow of the pulp.

3. The combination of the screens, the scrapers, the water-discharge pipes mounted on the scrapers, and discharging at the front ends of the scrapers in line with the flow of the pulp and means for operating the scrapers.

4. The combination of the screens, the scrapers, and means for moving the scrapers transversely across the screens at right angles to the direction in which the pulp flows.

5. The combination of the screens, a series of scrapers, moving transversely across the screens, and another series of scrapers moving transversely across the screens but operated to move in one direction, while the first-mentioned set are moving in the opposite direction.

6. The combination of the screens, the scrapers, the water-discharge pipes carried thereby, and means for moving the scrapers and the water-discharge pipes transversely across the screens.

7. The combination of a series of screens, scrapers therefor, water-discharge pipes movable simultaneously with the scrapers, and means for moving the scrapers and water-discharge pipes simultaneously from a common driving-shaft.

8. The combination of a series of screens, a water-supply pipe, branch pipes connected therewith, and extending longitudinally over the screens, a series of scrapers, water-discharge pipes carried thereby, and flexible connections between these water-discharge pipes and the branch pipes of the main supply-pipe.

In testimony whereof I have hereunto subscribed my name.

GEORGE S. WITHAM.

Witnesses:

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