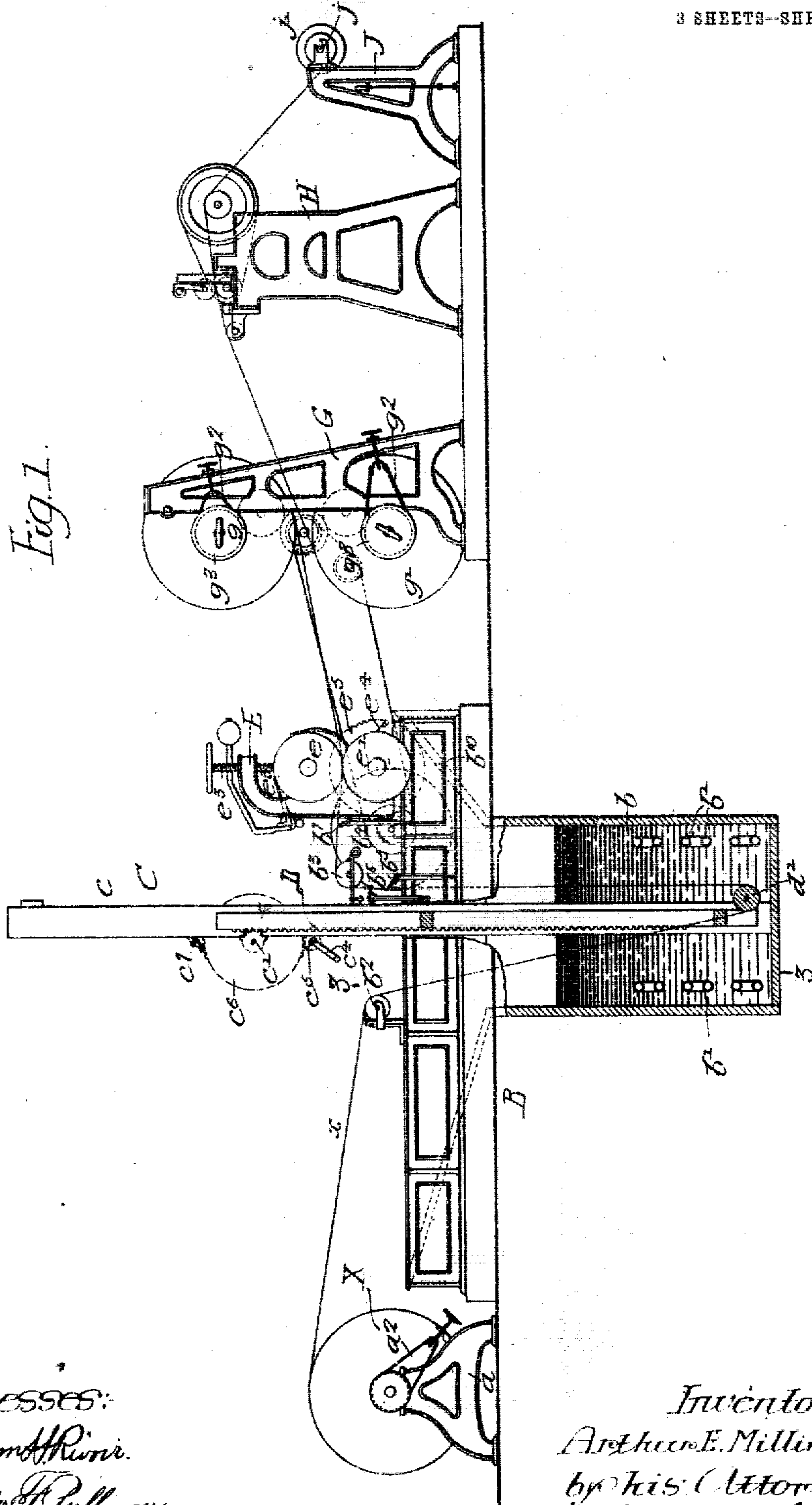


No. 825,744.

PATENTED JULY 10, 1906.

A. E. MILLINGTON.
PAPER TARRING APPARATUS.
APPLICATION FILED DEC. 12, 1905.

3 SHEETS--SHEET 1.



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Walter H. Pullinger.

Inventor
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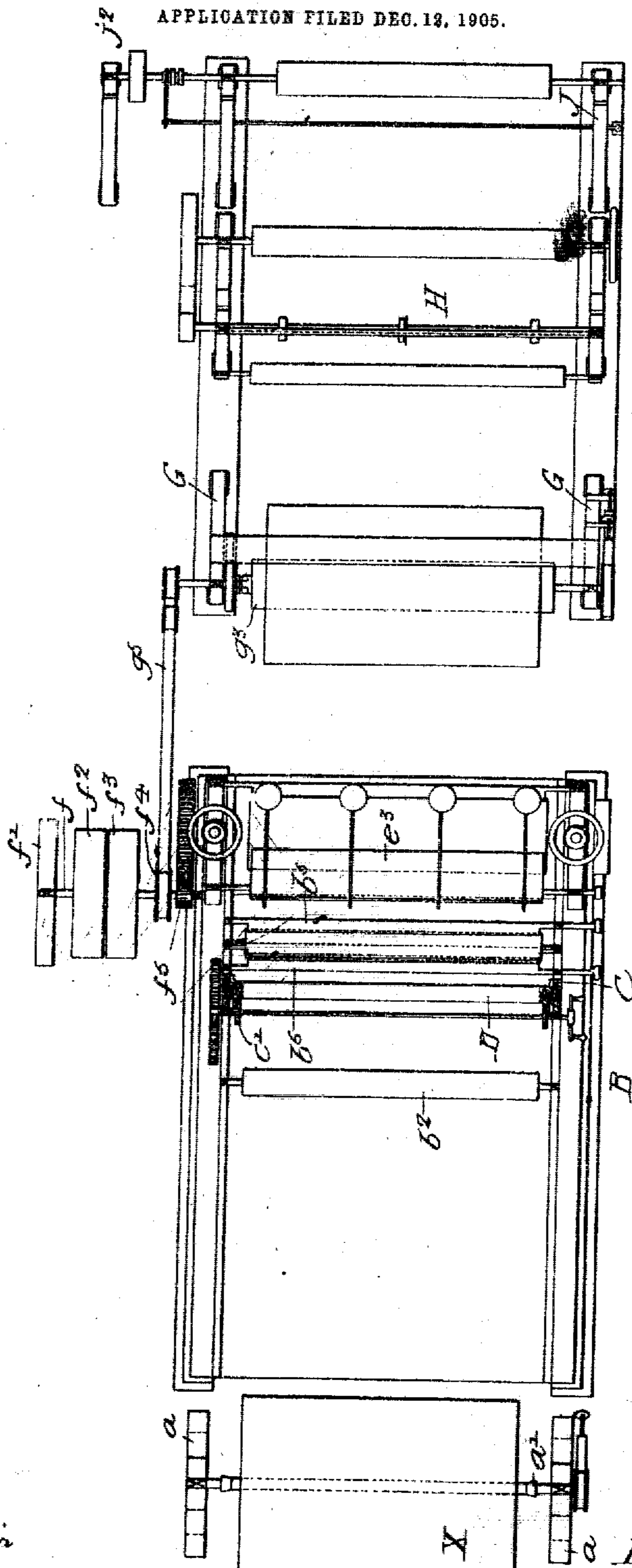
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3 SHEETS—SHEET 2.

Fig. 2.



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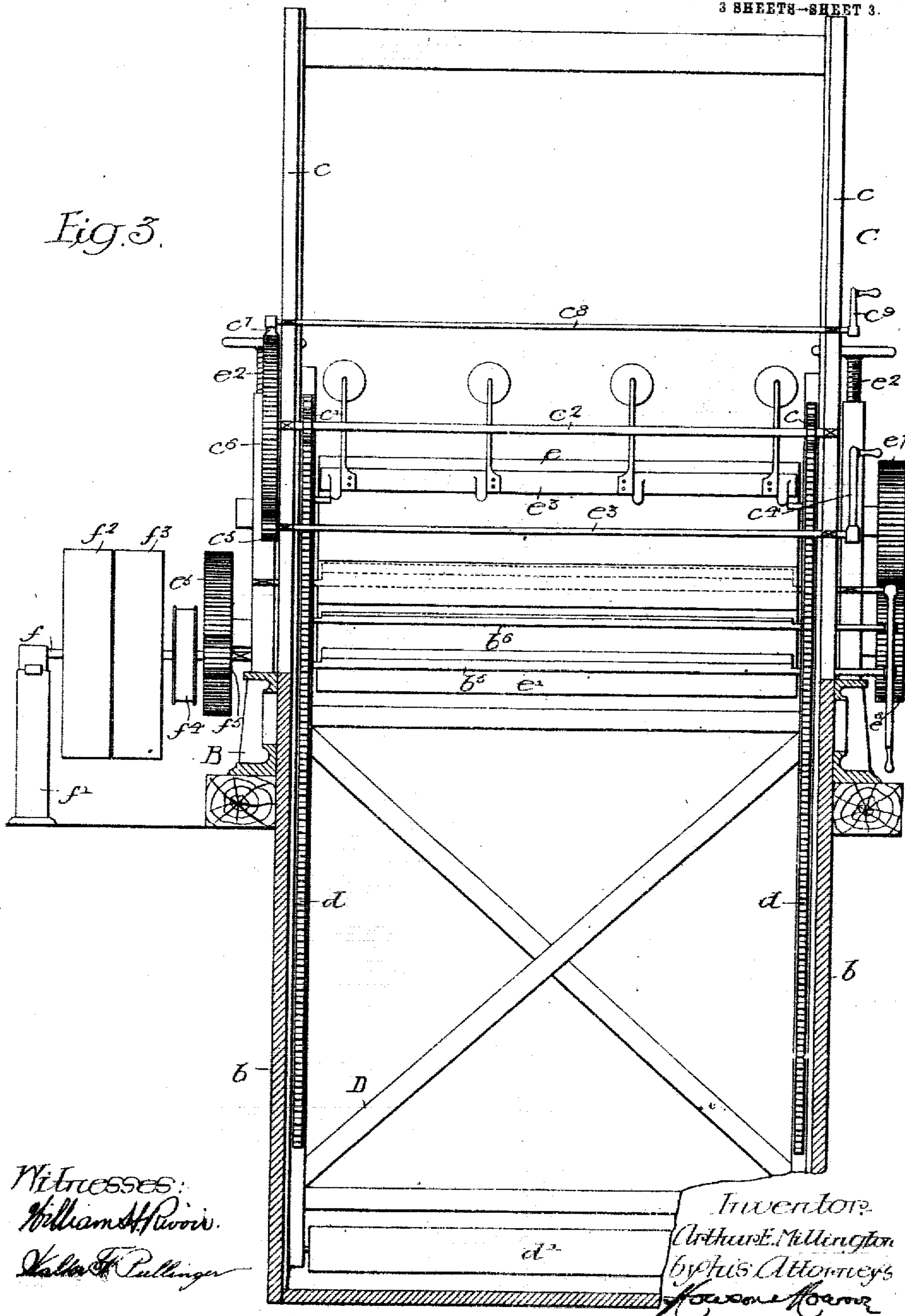
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3 SHEETS-SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

ARTHUR E. MILLINGTON, OF ESPANOLA, CANADA.

PAPER-TARRING APPARATUS.

No. 825,744.

Specification of Letters Patent.

Patented July 10, 1906.

Application filed December 12, 1905. Serial No. 291,463.

To all whom it may concern:

Be it known that I, ARTHUR E. MILLINGTON, a citizen of the United States, residing in Espanola, Ontario, Canada, have invented certain Improvements in Paper-Tarring Apparatus, of which the following is a specification.

One object of my invention is to provide a machine for applying tar to a continuous strip of paper in such manner that the successive layers of the finished tarred paper will not stick together when in the form of a roll.

Another object of the invention is to provide a relatively simple and yet efficient combination of parts for applying tar to a continuous strip of paper, which apparatus shall be so constructed and arranged as to require a minimum of attention and labor for its successful operation. These objects I attain as hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of my paper-tarring apparatus, showing in vertical section the interior of the tar-containing tank. Fig. 2 is a plan view of the apparatus shown in Fig. 1; and Fig. 3 is a vertical section taken on the line 3 3, Fig. 1.

In carrying out my invention I draw a continuous strip of paper through a body of tar contained in any suitable tank heated in any desired manner and after scraping from both surfaces of said strip of paper the superfluous liquid adhering thereto pass the paper between a pair of squeeze-rolls, whereby it is subjected to a relatively high pressure and the tar very completely driven into and through its substance. After coming from the squeeze-rolls the paper is wound in a roll and shortly thereafter unwound and removed, so that as a result of this treatment its successive layers have no tendency to stick together. Before the strip is finally wound it is usually passed through slitters, whereby it is cut to commercial widths.

In the above drawings, *a* represents two standards provided with bearings for the reception of a spindle *a'*, upon which is carried a roll *X* of paper to be tarred, there being provided on one of the standards any suitable device, as *a''*, for braking the spindle *a'* in order to cause the paper web *x*, drawn from said roll, to have a proper tension. Adjacent to said standards *a* is a box-like structure *B*, having a tank *b* for the reception of

the tar, and this tank is provided with any desired means—as, for example, steam-pipes *b'*—whereby its contents may be heated. A vertical frame *C* extends into and above the tank *b* and preferably includes two vertical guides *c*, in which operates a sliding frame *D*. Said frame has at each side a vertical rack *d*, whose teeth are engaged by pinions *c'*, carried upon a shaft *c''*, supported in bearings on the frame *C*, there being a second shaft *c'''* parallel to the first, having an operating handle or crank *c'''* and a pinion *c''''*, which meshes with the gear *c''* on said shaft *c''*.

The frame *D* carries at its lower end a roller *d'* and, as is plainly shown in Fig. 1, is vertically movable on the guides *c* by means of the above-described mechanism, there being provided a pawl or dog *e'*, carried upon a shaft *e''*, controlled by a crank-handle *e'''*, whereby the gear *e''* may be maintained in any desired position.

Carried upon the structure *B* in any suitable position between the frame *C* and the roll *X* is a guide-roll *b''*, while on the opposite side of said frame *C* is a second guide-roll *b'''*, having a scraper *b''''*, whereby tar is removed from its surface. Suitably carried by the structure *B* are two other scrapers *b'''''* and *b''''''*, placed to operate upon the opposite sides of the strip of paper extending between the rolls *d'* and *b'''*, in addition to which there is a third scraper *b'''''''*, placed to engage the under side of the paper strip after it leaves said roll *b'''*.

Carried in bearings in suitable standards *E* are a pair of squeeze-rolls *e* and *e'*, having means—as, for example, the screw *e''*—whereby the pressure exerted by them upon a strip of material may be varied. A weighted scraper *e'''* bears upon the roll *e*, while a second scraper *e''''* engages the surface of the roll *e'* for the purpose of removing any tar which may collect thereon.

In order to drive these squeeze-rolls, I provide a shaft *f*, supported in bearings on the structure *B* and on the standard *f'* and provided with fast and loose pulleys *f''* and *f'''*, there being upon said shaft in addition a pulley-wheel *f''''* and a pinion *f'''''*. Meshing with this pinion is a gear-wheel *e''*, carried on one end of the supporting-shaft of the squeeze-roll *e'*, while on the opposite end of said shaft is carried a wheel *e''''* in mesh with a gear-wheel *e'''''*, fixed to the adjacent end of the shaft of squeeze-roll *e*. Adjacent to the end of the structure *B*, upon which the squeeze-rolls are

carried, is a frame G, having bearings for a pair of spindles g and g' , upon which are loosely carried tubular spindles g^2 , capable of being operatively connected to their respective supporting-shafts by clutch mechanism g^4 . The shafts themselves are directly driven by means of gearing, (shown in dotted lines in Fig. 1,) which in turn is actuated through the medium of a belt g^5 , passing over the pulley f^4 on the shaft f . Suitable braking means for the tubular spindles g^2 is provided, as indicated at g^3 , it being understood that said means may be applied to that one of the two shafts g^2 from which paper is being unwound to control the tension thereof.

Preferably carried upon the same foundation as that supporting the frame G is a paper-slitting machine H, and beyond this is a winding device consisting of a pair of spindles J, supported on the shaft j , on which is carried the roller j' for the reception of two or any desired number of rolls of paper, this shaft being driven by means of power applied to a pulley-wheel j^2 .

In order to operate the machine, a roll of paper to be tarred, as X, is placed upon the shaft a' of the frame a and the paper web is drawn from this roll over the guide-roll b^2 . The frame D being raised to the upper part of the frame C, said web is passed under the roller d' , between the scrapers b^5 and b^6 , over the guide-roll b^3 , and between the squeeze-rolls e and e' , and by suitable manipulation of the crank-handle c^4 said frame D is lowered until the roller d' is practically at the bottom of the tank d . The tar in said tank being heated to a suitable temperature, the paper is drawn from the roll X through the said tar and after passing through said squeeze-rolls is wound upon a tubular shaft carried by one of the spindles g or g' .

It will be understood that the braking means a^2 is adjusted so as to cause the paper web x to have a proper tension, and in addition the squeeze-rolls are pressed together, so as to exert the desired pressure upon the web as it passes between them, so that the tar is pressed into the fibers of the paper to such an extent that it may be safely wound into a roll without the separate layers sticking together. In order to insure the layers of this tarred paper from sticking together at any future time, I place the completed roll upon the spindle g' and cause it to be unwound by the action of the receiving-roll j' upon the shaft j , which draws the web through the slitting-machine H and winds its different sections into rolls of commercial size, there being another roll of paper under process of formation on the upper spindle.

It will be seen that after passing into the tar-bath the web of paper is drawn vertically out of the same and while being so moved is engaged by the scrapers b^5 and b^6 , which remove the greater portion of the superfluous

tar from it. There is in addition an auxiliary scraper b^7 , which removes a further quantity of tar from the web before it passes to the squeeze-rolls e and e' , which latter naturally cause another portion of the still liquid tar to be expressed from the paper.

For the purpose of collecting these various bodies of tar I preferably provide an inclined extension at the end of the tank b , as indicated at b^{10} , whereby the tar removed by the scrapers and squeeze-rolls may be directed back into the said tank.

It will be further noted that the squeeze-rolls so press the tar into the fibers of the paper that it is not only free from stickiness to such an extent as to allow of its being wound in a roll without the layers adhering to each other, but in addition after it has once been unwound from said roll and rewound the layers of the finished rolls have no tendency at any time to stick together. Hitherto from twenty-five to thirty per cent. of the rolls of tar-paper supplied to the trade have been found to be practically worthless because of the sticking together of their layers, and I have found that after paper has been tarred in the above machine and then unwound and rewound said sticking has been absolutely avoided, even though the finished paper be stored for long periods of time.

The mere passage of paper through a tar-bath and between the squeeze-rolls, followed by immediate winding, has not been found to secure the above-noted advantageous results, since it has been found that on unwinding for use a large number of rolls invariably were rendered useless, owing to the sticking together of their various layers. If, however, paper be unwound from its primary roll, so as to be fully exposed to the air, and then rewound, the objectionable and destructive sticking above noted is prevented.

Another incidental advantage of this process of treatment is due to the fact that a double sheet seventy-two inches wide is handled in one operation—that is, the wide sheet is passed through the tank and while being unwound from its primary roll is cut into sheets and then wound in small rolls of commercial size.

I claim as my invention—

1. The process of preparing tarred paper, which consists in passing a continuous web of paper through a body of tar, subjecting the coated paper to relatively high pressure to force the tar into and through the fibers of the same, winding said paper in a roll, then unwinding the paper so that it is exposed to the air and finally rewinding said paper, substantially as described.

2. In a machine for tarring paper, the combination of a tank, a guide-roll in said tank, means for directing a paper web into the tank to said guide-roll, and means for directing the web in a substantially vertical line from

said guide-roll out of the tank, a scraper or scrapers placed to engage the vertical part of the web after it emerges from the liquid in the tank, with squeeze-rolls placed to engage the paper web after it has passed said scraper or scrapers, substantially as described.

3. A machine for tarring paper consisting of a tank, a guide-roll having means whereby it is retained below the level of the liquid in the tank, a guide-roll for directing the paper web into the tank to said first guide-roll, a second guide-roll for causing the paper web to be drawn in a substantially vertical line out of the tank, squeeze-rolls, a pair of scrapers placed to act upon opposite sides of the vertically-extending portion of the web, and a second scraper placed to act upon the under

side of the web before it passes to the squeeze-rolls, substantially as described.

4. A machine for preparing tarred paper consisting of a tank, means for directing a web of paper through liquid in said tank, squeeze-rolls, means for winding the paper in a roll after it passes through said squeeze-rolls, with means for unwinding and subsequently rewinding the freshly-tarred paper from said first roll, substantially as described.

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

ARTHUR E. MILLINGTON.

Witnesses:

SUSIE SNYDER,

J. A. MILLINGTON.