

No. 864,565.

PATENTED AUG. 27, 1907.

C. R. ROGERS.

PROCESS OF RETTING OR DEGUMMING FIBROUS MATERIAL.

APPLICATION FILED AUG. 11, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

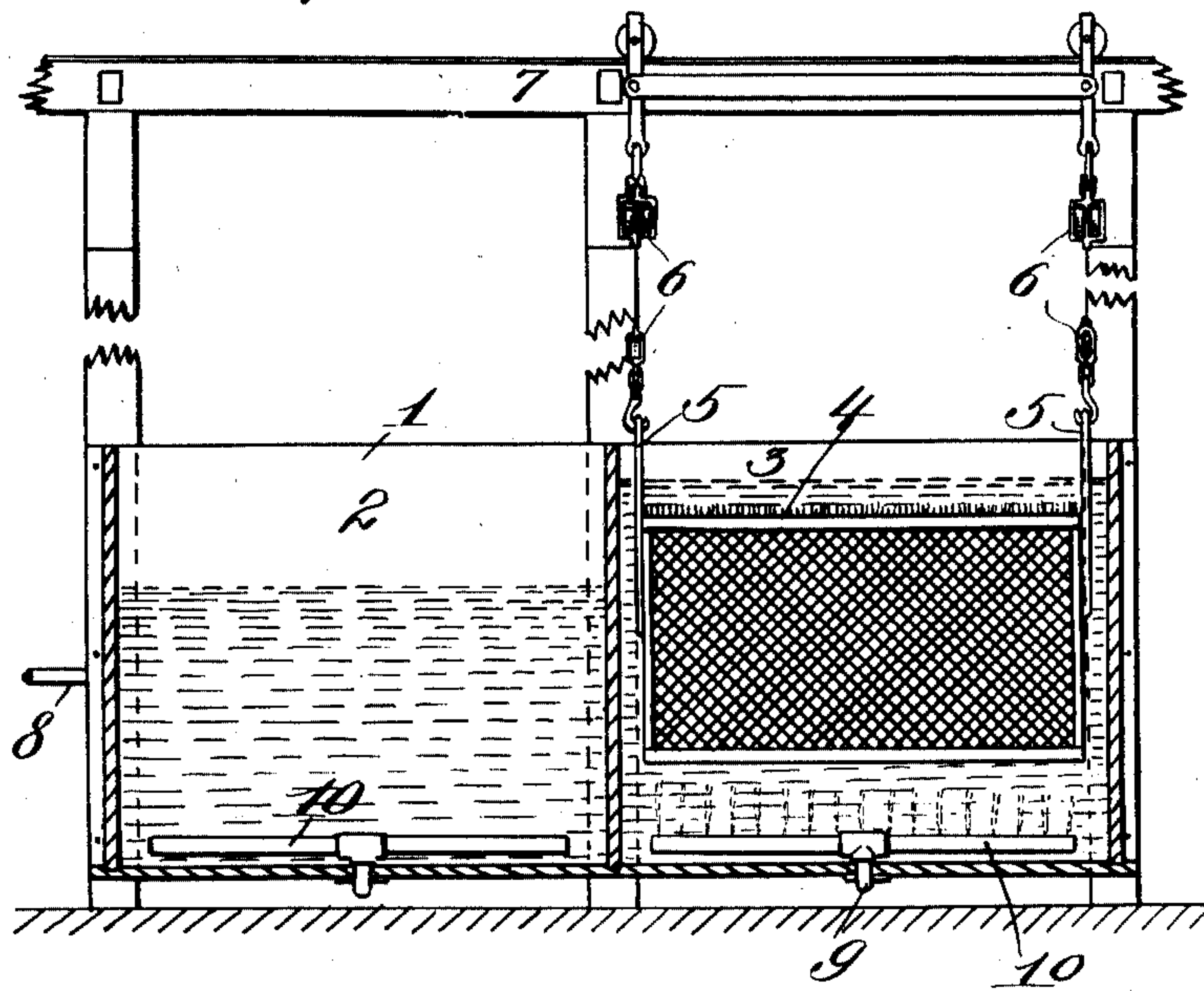
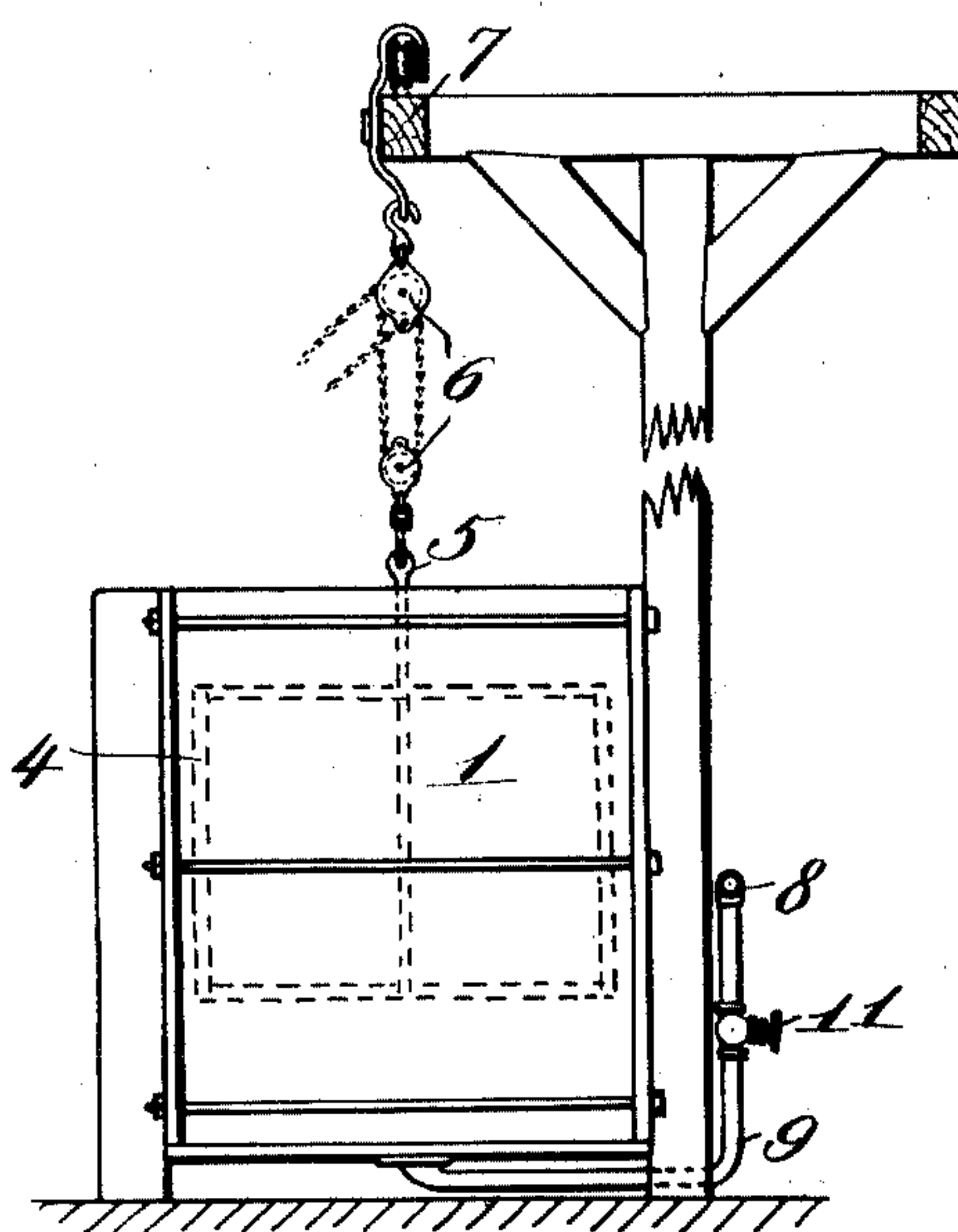


Fig. 2.



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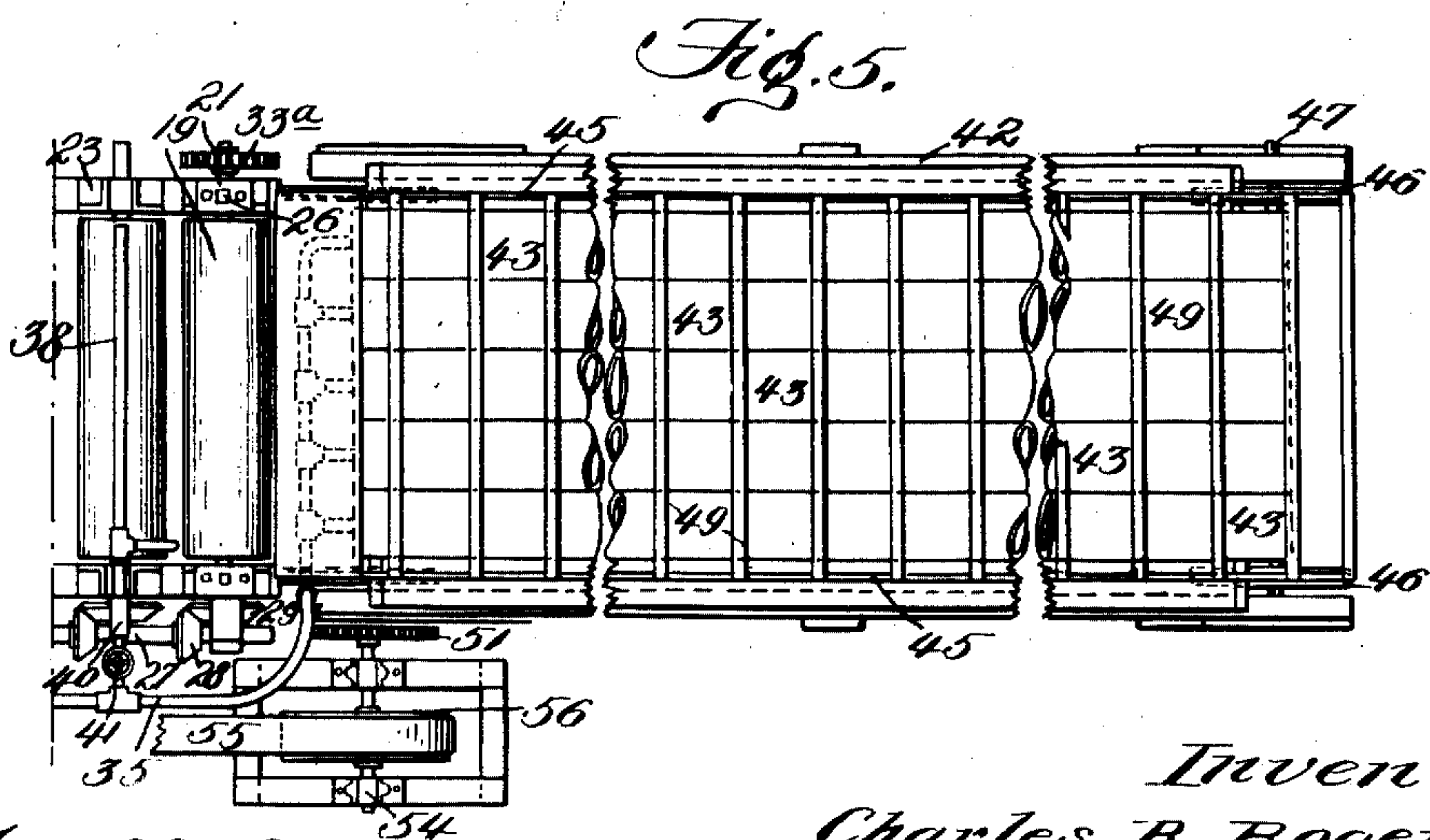
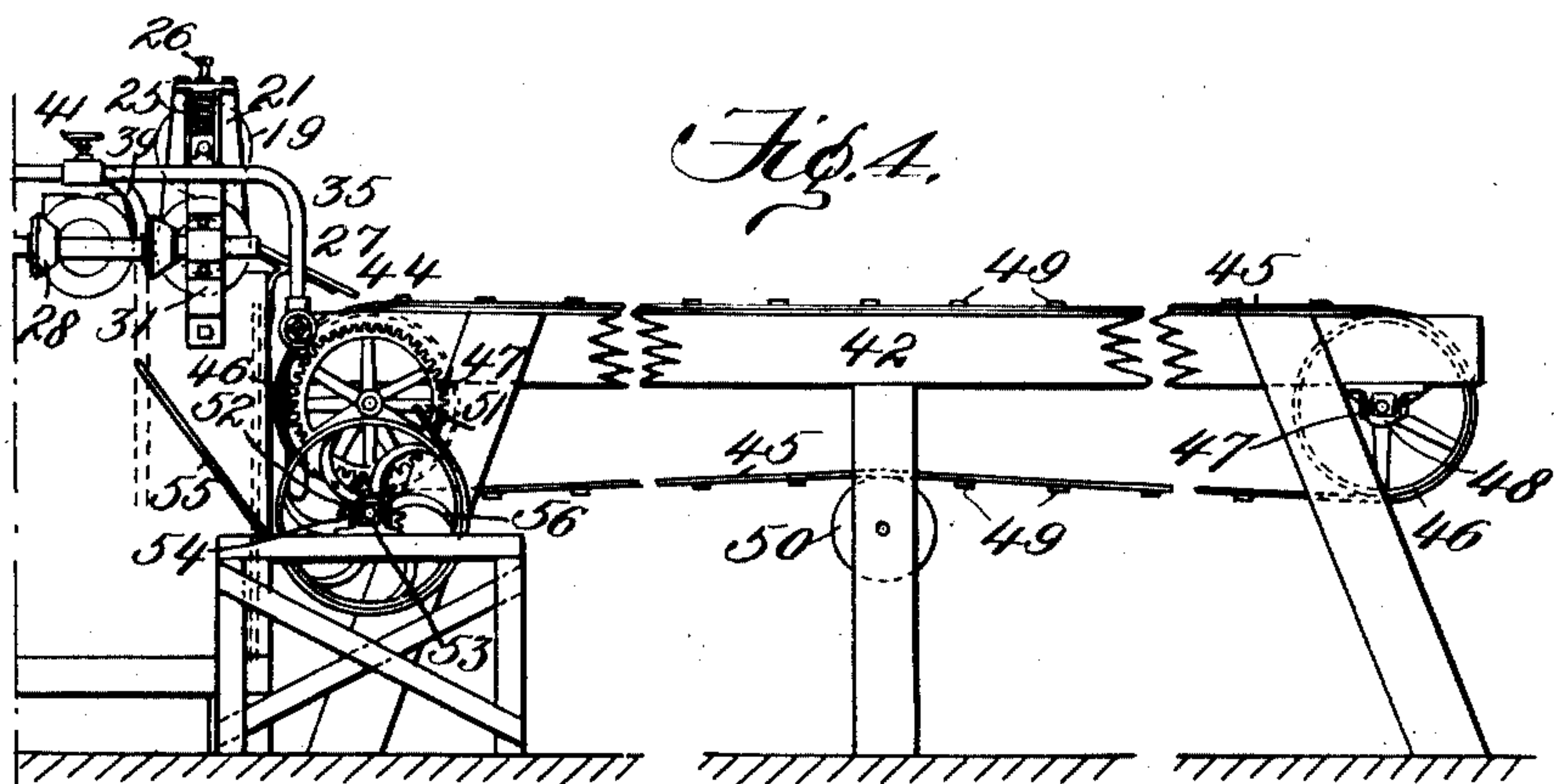
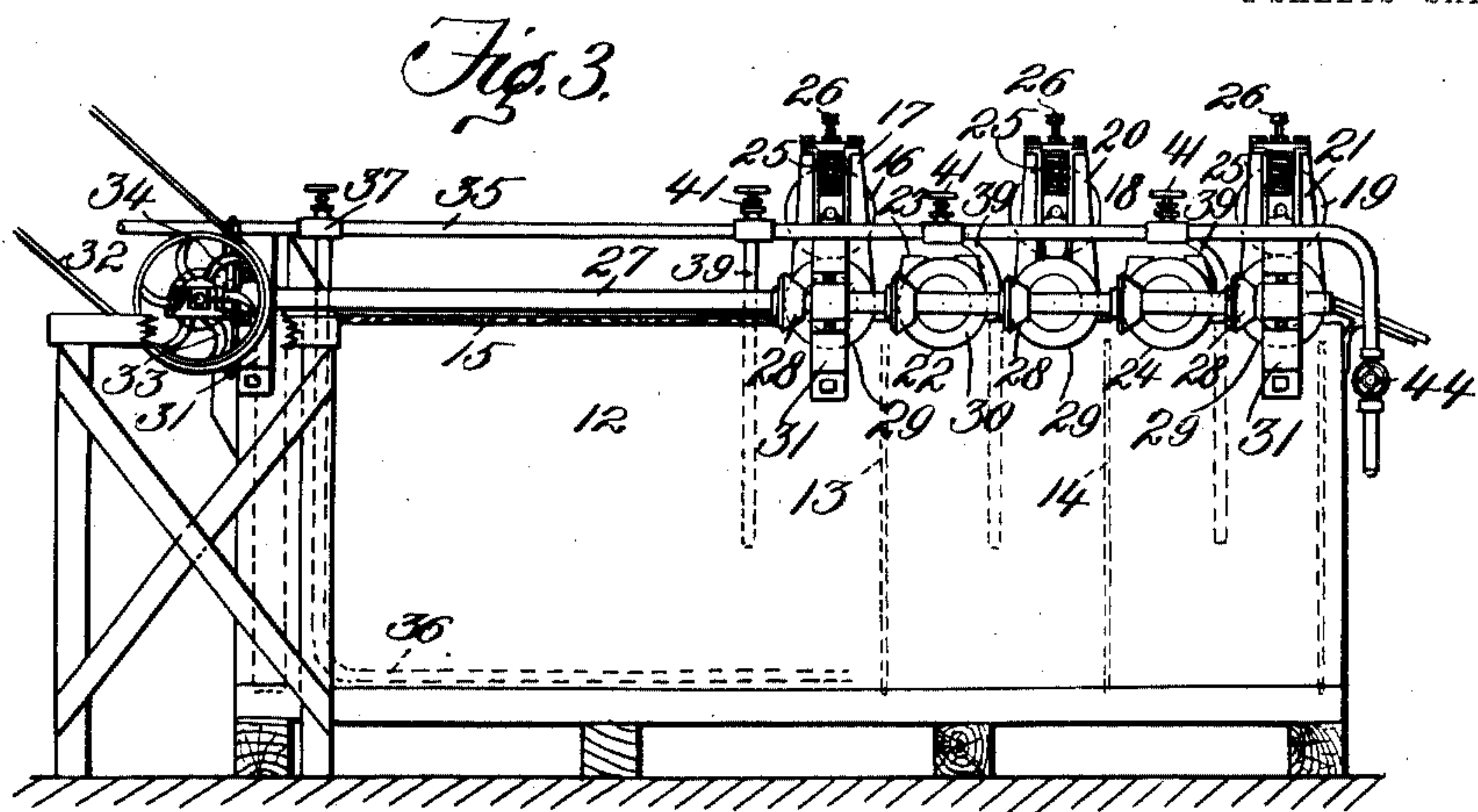
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UNITED STATES PATENT OFFICE.

CHARLES ROBERT ROGERS, OF SOUTH MELBOURNE, VICTORIA, AUSTRALIA.

PROCESS OF RETTING OR DEGUMMING FIBROUS MATERIAL.

No. 864,565.

Specification of Letters Patent.

Patented Aug. 27, 1907.

Application filed August 11, 1906. Serial No. 330,235.

To all whom it may concern:

Be it known that I, CHARLES ROBERT ROGERS, a subject of the King of Great Britain, residing at No. 56 Clarke street, South Melbourne, in the State of Victoria and Commonwealth of Australia, have invented an Improved Process of Retting or Degumming Fibrous Material Preparatory to Obtaining the Fiber Therefrom, of which the following is a specification.

My invention consists of an improved process of retting or degumming and subsequently cleaning and drying fibrous plants, stalks, leaves, and straws, and the like, such as linum, phormium, ramie, sisal, hemp, etc., preparatory to breaking and scutching the same to obtain the fiber therefrom.

In order to obtain fiber from fibrous plants etc. a preliminary step in the process consists in freeing the fibers from the gummy matter adhering to them. This is effected at present either by dew retting, or by the use of chemical solutions, but up to the present none of the means employed have been a success, and all of them are slow in operation. Now by my invention fiber can be obtained from fibrous plants within one hour from the commencement of operations, and such fiber I have found in actual experiment is not deteriorated in any way by the treatment it has undergone and moreover retains its natural color.

My process consists essentially in effecting the retting or degumming by boiling the material to be treated in a vat containing water to which has been added an emulsion of linseed oil. When the material has been sufficiently boiled, which is indicated by its sinking beneath the surface of the water in the vat, it is removed and passed between three or more sets of squeezing rollers. While passing between the first set, the material is sprayed with water to which has been added some of the same emulsion of linseed oil as used in the boiling operation. The material then passes between each of the further sets of rollers and in its passage therethrough it is sprayed with water alone with the result that when it leaves the last set of rollers any gummy matter left in the material after the boiling operation, together with any fleshy matter has been removed and the material then passes on to, and along a drying table. When it reaches the end of the drying table it is in a fit condition to be subjected to the ordinary breaking and scutching apparatus.

The emulsion of linseed oil which I use in the boiling of the material under treatment, and in the spraying thereof, while passing through the first set of rollers may be prepared in any well known manner, but I prefer to make said emulsion in the following manner. I take 100 pounds of linseed oil and 13.5 pounds of caustic soda. The latter is dissolved in 22 pounds of water and the linseed oil added. The whole is then heated until a temperature of about 70° F., is reached

when the two ingredients are thoroughly admixed and allowed to stand for from 2 to 7 days, the longer period by preference. Three times the weight of water is then added and the whole boiled until thoroughly dissolved.

The quantity of the emulsion of linseed oil which I add to the water for boiling the material and for subsequently spraying it when passing through the first set of rollers varies according to the material being treated. I have however found that for treating flax two pounds by weight of the emulsion for every 100 pounds of water is sufficient while for ramie and similar material the quantity of emulsion should be doubled.

The apparatus which I have devised for carrying my process into effect is clearly illustrated in the drawings annexed, in which:—

Figure 1 is a sectional side elevation of a boiling vat having two compartments, in one of which is shown a crate containing the material to be treated and the means for lowering the said crate into and removing it from the vat. Fig. 2 is an end elevation of Fig. 1. Fig. 3 is a view of that portion of my apparatus in which the cleaning of the material, that is, the removal of any gummy matter left after the boiling operation together with the fleshy matter, is effected. Fig. 4 is a side elevation of the drying table. Fig. 5 is a plan of Fig. 4.

1 represents the boiling vat which as illustrated has two compartments 2 and 3, but a greater number may be used if thought requisite. Each of these compartments contain water to which has been added the requisite quantity of the emulsion of linseed oil.

4 is a crate which as shown is immersed in the liquid in the right hand compartment 3 and holds the material to be treated. A similar crate can be inserted in the left hand compartment 2.

5 are eye bolts or straps secured to the ends of the crate 4 and are for the purpose of connecting it with block and tackle gearing 6 which is suspended from and runs upon an over head guide or beam 7.

8 is a horizontal steam pipe on one side of the vat 1. 9 are branches to convey steam from said pipe 8 to the center of the bottom of each compartment of the vat 1. These branches 9 are each connected to the center of a horizontal pipe 10 having perforations through which steam can be forced to heat the contents of the vat 1. Each of the branches 9 is provided with a tap 11 to regulate the quantity of steam passing therethrough.

12 is a tank divided into three compartments by vertical walls 13 and 14. The left hand and largest compartment contains water, and some of the same emulsion of linseed oil as used in the boiling vat 1, while the second and third compartments respectively contain pure water only.

15 is a lid which covers nearly the whole of the top of the left hand and largest compartment.

16 is a set of squeezing rollers supported in vertical U-shaped standards 17 and extending across that end of the left hand and largest compartment which is formed by the division wall 13. A similar set of squeezing rollers 18 and 19 extend across each of the smaller compartments and are supported in vertical U-shaped standards 20 and 21. These squeezing rollers are shown as plain rollers in the drawings, but they may be grooved or fluted.

22 is a conveying roller which extends across the tank 10 between the squeezing rollers 16 and 18 and is supported at either end by a short vertical standard 23.

24 is a conveying roller between the squeezing rollers 18 and 19 and supported in the same manner as the roller 22. The top of each standard 17, 20, and 21, is provided with a spiral spring 25 and set screw 26 to regulate the pressure between their respective squeezing rollers 16, 18, and 19.

27 is a horizontal shaft fitted with bevel cogs 28 which engage with other bevel cogs 29 on the ends of the lowermost squeezing roller in each set and also with cogs 30 on the ends of the conveying rollers 22 and 24. The said shaft 27 is supported in standards 31 and is operated by a belt 32 and pulley 33 through the intervention of bevel gearing 34. The opposite ends of the squeezing rollers are each provided with a spur wheel 33^a (see Fig. 5) of similar size, and gearing into one another, thus insuring both rollers in each set operating at the same time and rate.

35 is a branch of the steam pipe 8, and 36 is a pipe which leads from the branch 35 down one side and across the bottom of the left hand and largest compartment in the tank 12. Said pipe 36 is provided with a tap 37, and that portion of the pipe which rests on the bottom of the tank is perforated to allow the escape of steam to heat the water and emulsion of linseed oil contained in the compartment. Projecting at right angles from the branch 35 of the steam pipe 8, and extending across the top of the tank 12 and about nine inches in front of each set of squeezing rollers 16, 18, and 19 respectively, is a perforated pipe 38 (see Fig. 5) the perforations in which are on the side of the pipe 38 nearest the said rollers. Each of these perforated pipes is provided with a depending pipe 39 open at the bottom, and also with an injector 40 which forces steam into said pipe 38 from the pipe 35 and causes the liquid contents of each compartment of the tank 12 to ascend the pipes 39 and be sprayed from the perforated pipes 38 upon the squeezing rollers adjacent to said perforated pipes.

The liquid after being sprayed upon the squeezing rollers 16, 18, and 19 falls into the respective compartments from which it was withdrawn.

41 are taps to cut off the supply of steam to the perforated pipes 38.

42 is the drying table which abuts against one end of the tank 12. The top of said table 42 is formed by a number of longitudinal pipes 43. Said pipes 43 are heated by steam from the steam supply pipe 35. 44 is a tap on the said pipe 35 to control the amount of steam passing to the pipes 43.

45 are two endless chains passing round large sprocket wheels 46 supported on spindles 47 running in plummer blocks 48 on the under side of and at opposite ends of the table 42. Said endless chains 45 are connected together at regular intervals by straps or laths 49 for the

purpose of conveying the material to be dried along the top of the table.

50 is a roller situated under and in the center of the table 42 to support the slack part of the endless chain 45.

51 is a spur wheel on one of the spindles 47 and gears into a pinion 52 on the horizontal shaft 53 supported in plummer blocks 54. Motion is imparted to the endless chains 45 by the belt 55 and pulley 56 on the horizontal shaft 53.

The mode of operation is as follows: The crate 4 is filled with the material to be treated and lowered by means of the block and tackle gearing 6 into the boiling vat 1 in which has been previously placed the requisite quantity of water and emulsion of linseed oil, the quantity of the latter varying as previously explained according to the character of the material to be treated. The contents of the vat 1 are then heated to a temperature of about 98° C., by forcing steam into the vat from pipe 8 through the perforations in the pipe 10. As the material in the crate 4 becomes thoroughly saturated with the heated liquid in the vat 1 the crate gradually descends until it is entirely below the surface of the liquid which is an indication that the practical retting or degumming of the material has been effected. The crate 4 is then raised by the block and tackle gearing 6 from the vat 1 and run along the guide or beam 7 and lowered in close proximity to the tank 12. The material is then removed from the crate 4 and placed on the lid 15 of the tank 12. From the lid 15 it is fed to the first set of squeezing rollers 16 to which and the other parts of the cleaning portion of my apparatus motion is imparted by the means hereinbefore described. In its passage through said squeezing rollers 16 the material as it enters between the rollers is sprayed with the mixture of water and emulsion of linseed oil from the left hand compartment of the tank 12. By the time the material leaves the first set of rollers 16 the retting or degumming has been completed. The material is conveyed by the roller 22 to the next set of squeezing rollers 18 from which it is again conveyed by the roller 24 to the last set of squeezing rollers 19. During its passage through the squeezing rollers 18 and 19 the material as it enters between the rollers is sprayed with water from the two right hand compartments of the tank 12. By the time the material leaves the last set of rollers it is perfectly clean and most of the moisture has been squeezed from it. The liquid used in spraying after performing its function falls back into the respective compartments of the tank 12 from which it was pumped and may consequently be used over and over again. The material after passing through the last set of squeezing rollers 19 falls onto the end of the drying table 42 and is conveyed slowly along to the opposite end thereof by the straps or laths 49 on the endless chains 45 when it is thoroughly dry. It is then ready for treatment in the ordinary breaking and scutching apparatus.

When it is desired to bleach the material before breaking and scutching, in lieu of feeding it from the last set of squeezing rollers 19 direct to the straps or laths 49 it is fed onto removable trays placed on the endless chain or belt 45 and when said trays reach the end of the drying table 42 they are removed and stacked in the open air until the bleaching is effected.

Having now fully described and ascertained my said

invention and the manner in which it is to be performed,
I declare that what I claim is:—

1. A process of retting or degumming fibrous material
comprising the boiling of the material to be treated in wa-
5 ter to which has been added an alkaline solution of linseed
oil, then submitting the boiled material to pressure and
simultaneously with the application of pressure to the ma-
terial spraying the latter with water to which has been
added an alkaline solution of linseed oil, then subjecting
10 the sprayed material to pressure and simultaneously there-
with spraying the material solely with water, and then
subsequently drying the material.

2. A process of retting or degumming fibrous material
comprising the boiling of the material to be treated, then

passing the boiled material between a plurality of sets of 15
squeezing rollers and simultaneously with the subjecting
of the material to said squeezing rollers, spraying it with
an alkaline solution of linseed oil, and then passing the
sprayed material through another set of squeezing rollers
and simultaneously with the passage of the material 20
through said last set of squeezing rollers, subjecting it
solely to water.

In witness whereof I have hereunto set my hand in
presence of two witnesses.

CHARLES ROBERT ROGERS.

Witnesses:

WALTER S. BAYSTON,
GRANT BAYSTON.