

ALFALFA MILL.

991,893.

3 SHEETS--SHEET 1.



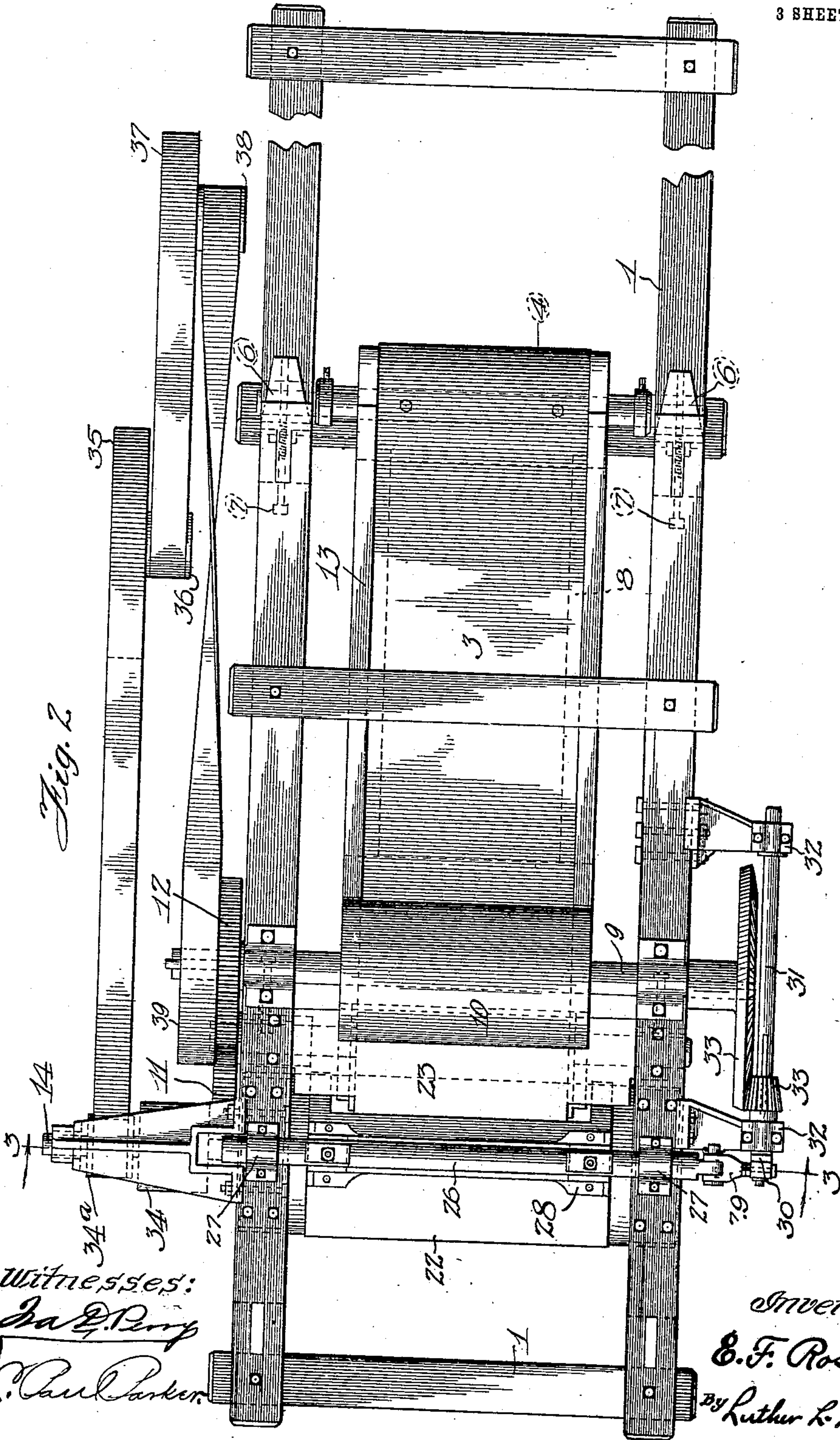
ALFALFA MILL.

APPLICATION FILED OCT. 12, 1908.

**991,893.**

Patented May 9, 1911.

3 SHEETS--SHEET 2.



Witnesses:

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Mfg.

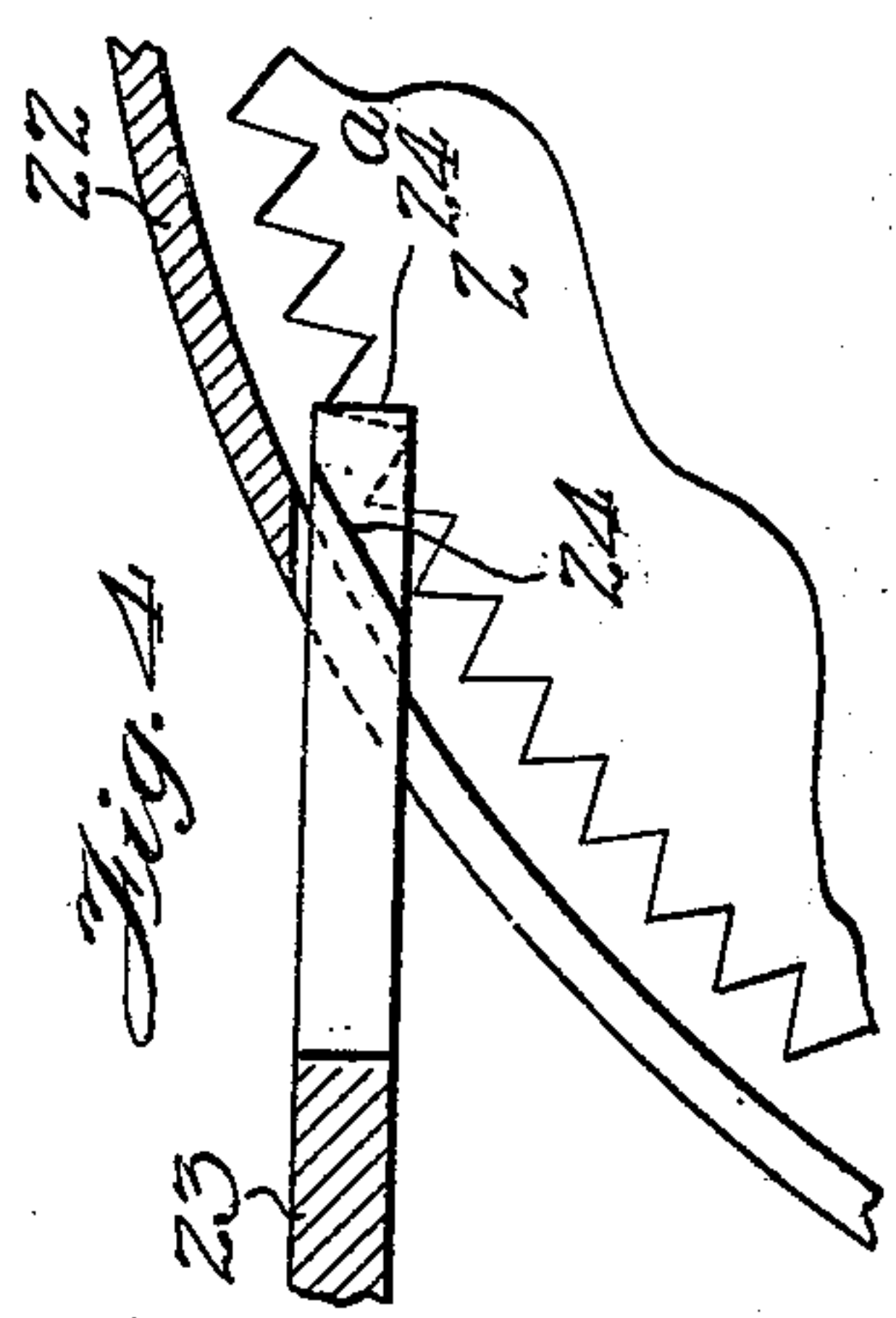
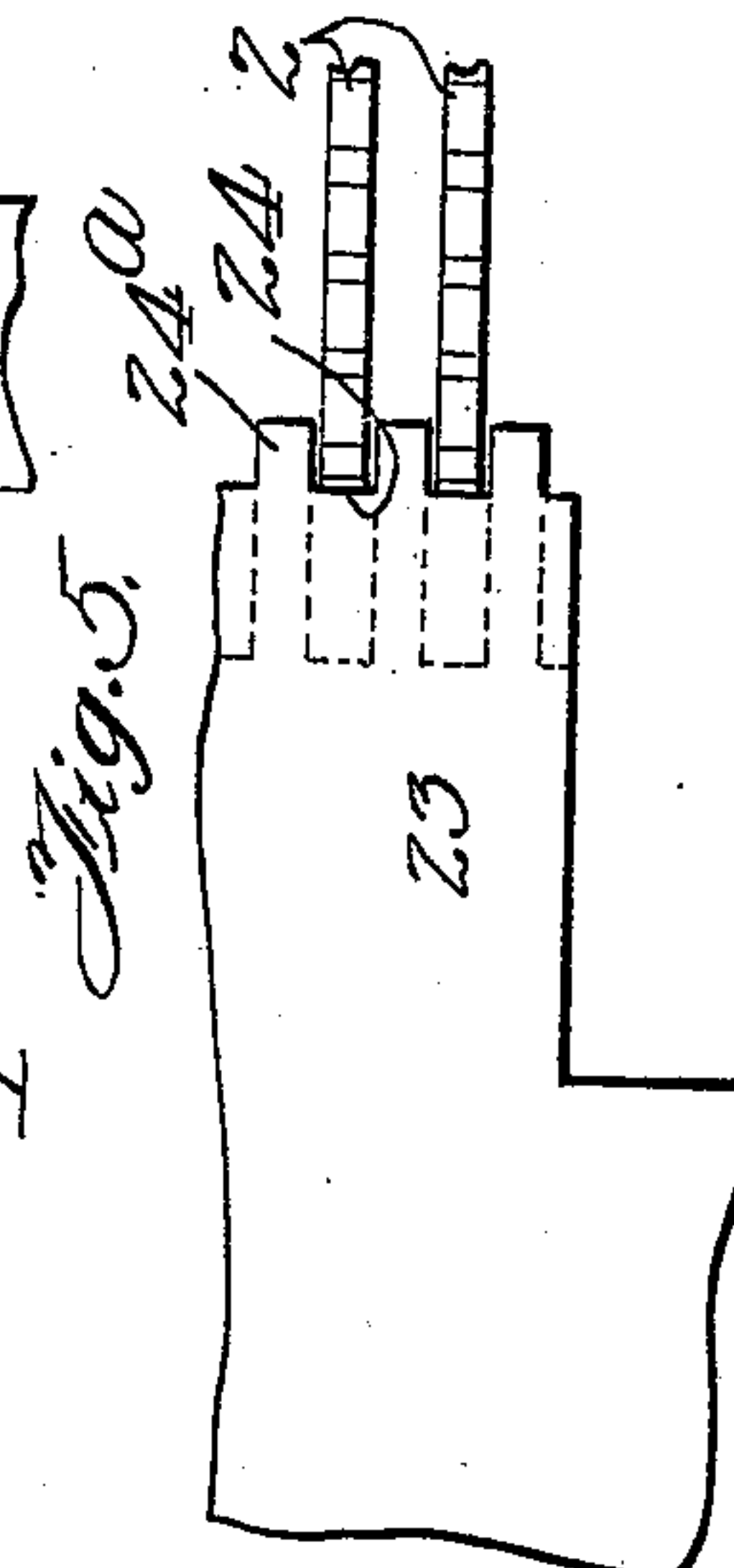
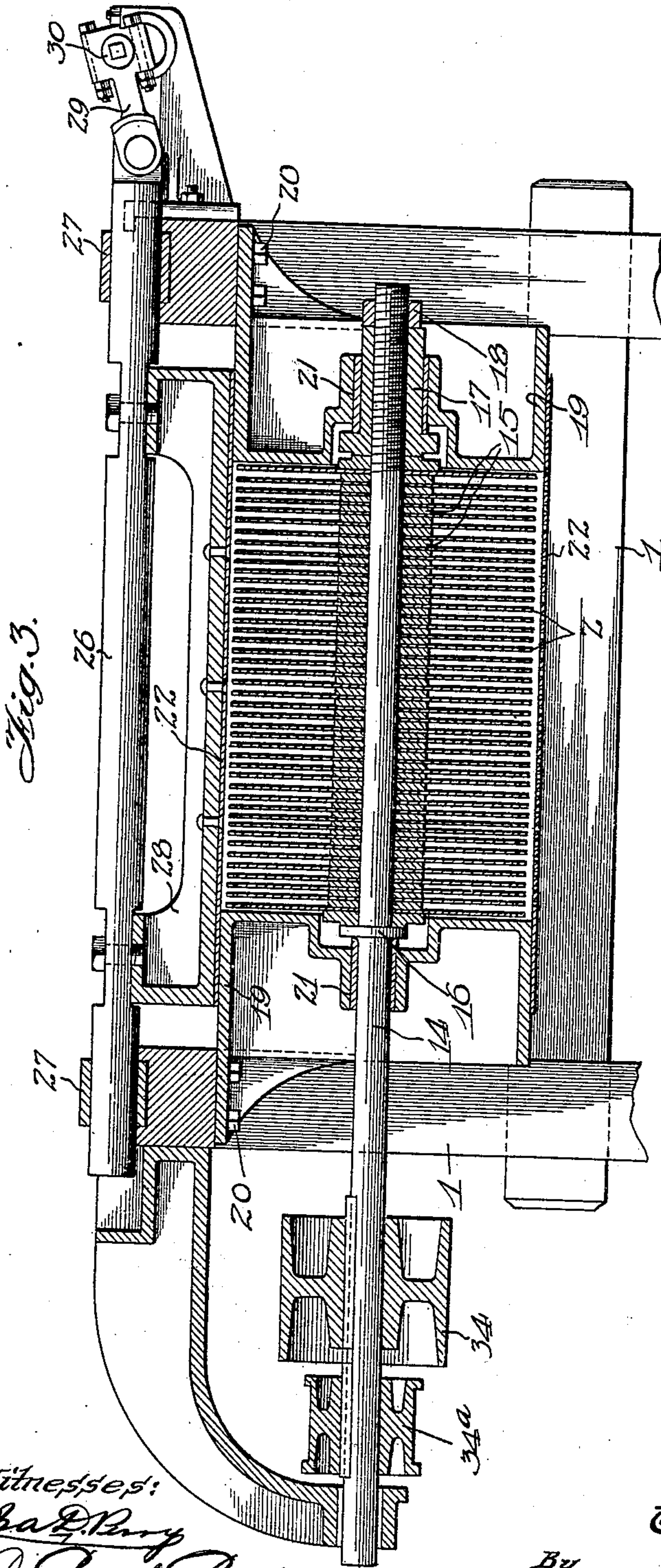


E. F. ROSE.  
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3 SHEETS-SHEET 3.



Witnesses:  
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*Edward F. Rose*  
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*Att.*



# UNITED STATES PATENT OFFICE.

EDWARD F. ROSE, OF FORT COLLINS, COLORADO, ASSIGNOR TO KANSAS CITY FEED COMPANY, LIMITED, OF PRESCOTT, ARIZONA TERRITORY, A CORPORATION OF ARIZONA TERRITORY.

ALFALFA-MILL.

991,893.

Specification of Letters Patent.

Patented May 9, 1911.

Application filed October 12, 1908. Serial No. 457,220.

*To all whom it may concern:*

Be it known that I, EDWARD F. ROSE, a citizen of the United States, residing at Fort Collins, in the county of Larimer and State of Colorado, have invented certain new and useful Improvements in Alfalfa-Mills, of which the following is a specification.

This invention relates to improved means for reducing alfalfa hay. Machines of this class, as heretofore constructed, have cut up or ground the leaves as well as the stalks.

It is the object of this invention to produce a mill that will reduce the stalks to the desired degree of fineness without grinding up a material portion of the leaves.

In the accompanying drawings Figure 1 is a longitudinal vertical section through a machine embodying the features of my invention. Fig. 2 is a top plan view of said machine. Fig. 3 is a section taken substantially on the plane of line 3 3 of Fig. 2. Figs. 4 and 5 are fragmental detail views of the reducing devices.

The framework 1 of the machine may be of any suitable construction. It supports the cutting devices 2 and the means for feeding the material to said cutting devices. The feeding means in this instance comprises a conveyer belt 3 extending over rollers 4 and 5, the roller 4 being mounted in bearing boxes 6 arranged to be adjusted in position by means of adjusting screws 7 to take up slack in the belt 3. The upper run of said belt is supported upon rails 8 fixed in the supporting frame.

Above the roller 5 and slightly forward thereof, is rotatably mounted a shaft 9 carrying a feed roller 10 arranged to cooperate with the feed belt 3 in feeding the alfalfa to the cutting devices. As herein shown the belt 3 is arranged to be driven by the intermeshing gears 11 and 12 upon the roller 5 and shaft 9, respectively. Side walls 13 extend along the opposite sides of the conveyer belt 3 from the roller 4 to the cutting devices 2.

The cutting devices comprise a gang of rotary saws mounted upon a shaft 14, said

saws being spaced apart by means of washers 15. The saws and washers are clamped together and secured to the shaft 14 by means comprising a shoulder or collar 16 on the shaft and a sleeve 17 screw-threaded on said shaft. A jam-nut 18 may be employed to lock the elements of the rotary cutting device together.

Two substantially cylindrical heads 19 are fixed in the opposite sides of the supporting frame 1 by means of bolts 20 and provide bearings 21 for the shaft 14 and the sleeve 17. The saws 2 are of slightly less diameter than the heads 19. Slidably mounted upon the heads 19 and inclosing the saws 2 is a shell 22 having a feeding opening therein extending from a point near the roller 5 to a point near the top of said shell. The portion of the shell extending from the roller 5 to the rear side of the saws is perforated, as indicated in Fig. 1. A plate 23 is fixed in the supporting frame in a horizontal position and extends between the feed roller 10 and one edge of the opening in the shell 22. As shown in Figs. 4 and 5, the edge of the plate 23 nearest to the saws 2 is notched, as at 24, to receive the teeth of the saws 2, providing fingers 24<sup>a</sup> which alternate with the saws 2, and assist in reducing the material. 25 is a guard overlying the roller 5 to prevent material from being drawn down between the roller 5 and the saws 2 by the belt 3. The shell 22 in this instance is arranged to be reciprocated longitudinally of the series of saws 2 by means herein shown as comprising a rod 26, slidably mounted in bearings 27 and carrying a bracket 28 to which the shell 22 is fixed. A pitman 29 connects the rod 26 with a crank 30 formed upon the end of a shaft 31, the latter being rotatably mounted in bearings 32. As herein shown, shaft 31 is driven from the shaft 9 by means of the intermeshing gears 33.

In the present instance power is communicated to the various elements by means comprising a drive pulley 34 fixed upon the shaft 14, and a pulley 34<sup>a</sup> also fixed on said shaft, said pulley 34<sup>a</sup> being belted to a pulley 35, the latter being fixed with relation



to a pulley 36 that is belted to a pulley 37. The latter is fixed with relation to a pulley 38 that carries a belt extending over a pulley 39 on the shaft 9. As hereinbefore  
5 stated, the conveyer belt 3 is driven from the shaft 9 through the intermeshing gears 11 and 12.

In operation, the alfalfa is placed upon the belt 3, which carries it up to the rapidly  
10 rotating saws. The latter cut the alfalfa and force it upward into contact with the fingers 24<sup>a</sup> of the plate 23, where the major part of the reduction is effected. The material is carried onward between the saws and  
15 the shell 22 until it reaches the perforated portion of said shell, where the pieces which are small enough drop through the perforations, the shell acting as a shaking screen by reason of its reciprocatory motion. The  
20 stems that lie between the saws 2 and are carried around by said saws act as a brush in assisting the saws to discharge the cut material through the perforated shell 22. As the alfalfa is carried around the space be-  
25 tween the saws and said shell, any portion of the stalks which was not sufficiently ground while passing the serrated edges of the plate 23 is moved longitudinally of the gang of the saws by the shell until it is  
30 gradually reduced to a size enabling it to pass out through the perforations in the shell. Only a very small per cent. of the leaves is ground up, because the leaves, being very light, are blown through the space be-  
35 tween the saws and the space between the saws and the shell 22 by the strong air current induced by the rapidly revolving saws, and are not acted upon by the saws to a material extent. It will be understood that the  
40 leaves, being dry and brittle, will break to some extent, but they are not cut or ground by the saws and hence are not reduced to powder.

The diameter, thickness and spacing of the  
45 saws, their speed of rotation, the length of stroke of the perforated shell 22 and its rate of movement, the size of the perforations in said shell, and the width of the space between said shell and the saws are determined by  
50 the capacity desired and the degree of fineness to which the material is to be reduced.

The machine herein shown and described is only one of several possible embodiments of the invention, wherefore I desire not to  
55 be limited to the details of construction illustrated, as various modifications will occur to a person skilled in the art.

I claim as my invention:

1. In a reducing mill, in combination, a  
60 shaft; a cutting device fixed to said shaft; substantially cylindrical heads in which said shaft is journaled, a cylindrical shell slidable on said heads and inclosing said cutting

device, said shell having a feeding opening therein, and means for reciprocating said  
65 shell.

2. In a reducing mill, the combination with a rotary cutting device, of a reciprocatory perforated shell partially surrounding said device, and a stationary plate adapted  
70 to cooperate with said cutting device, said plate having notches in one of its edges, and said rotary cutting device extending into said notches.

3. In an alfalfa mill, in combination, a  
75 gang of rotary cutting devices, said devices being spaced apart from each other, a cylindrical shell surrounding said gang and providing a space between itself and said gang, said shell having a feeding opening in one  
80 side and being perforated from a point adjacent said feeding opening to a point substantially diametrically opposite said feeding opening, and means for rotating said gang  
85 of cutting devices in the direction to first carry the material toward the imperforate

portion of the shell.  
4. In an alfalfa mill, in combination, a gang of rotary cutting devices, said devices being spaced apart from each other; a cylin-  
90 drical shell surrounding said gang and providing a space between itself and said gang, said shell having a feeding opening in one side and being perforated from a point adjacent said feeding opening to a point sub-  
95 stantially diametrically opposite said feeding opening, means for rotating said gang of cutting devices in the direction to first carry the material toward the imperforate  
100 portion of the shell, and means for reciprocating said shell longitudinally of the axis of said gang of cutting devices.

5. In an alfalfa mill, in combination, a gang of rotary cutting devices, said devices being spaced apart from each other, a cylin-  
105 drical shell surrounding said gang, said shell having a feeding opening in one side, and being perforated from a point adjacent said feeding opening to a point substantially diametrically opposite said feeding opening,  
110 said gang of cutting devices rotating in the direction to first carry the material in the direction toward the imperforate portion of the shell, a stationary plate fixed in position so that its edge lies adjacent said cutting de-  
115 vices and near the edge of the feeding opening toward the imperforate part of the shell, said edge being notched to form fingers which extend into the spaces between the cutting devices, and means for reciprocating  
120 said shell.

6. In an alfalfa mill, in combination, a gang of rotary cutting devices, said devices being spaced apart from each other, a cylin-  
125 drical shell surrounding said gang, said shell having a feeding opening in one side and



having a perforated portion, a conveyer having its discharge end adjacent one edge of said feeding opening, a feed roller opposite said conveyer, a stationary plate extending  
5 between said feed roller and the other edge or said feeding opening, the edge of said plate adjacent said feeding opening being notched to form fingers extending into the spaces between said cutting devices, and means for reciprocating said shell.

EDWARD F. ROSE.

Witnesses:

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NILS A. OLSON.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

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