

965,483.

2 SHEETS--SHEET 1.



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DRAFTING INSTRUMENT.  
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Patented July 26, 1910.

2 SHEETS—SHEET 2.

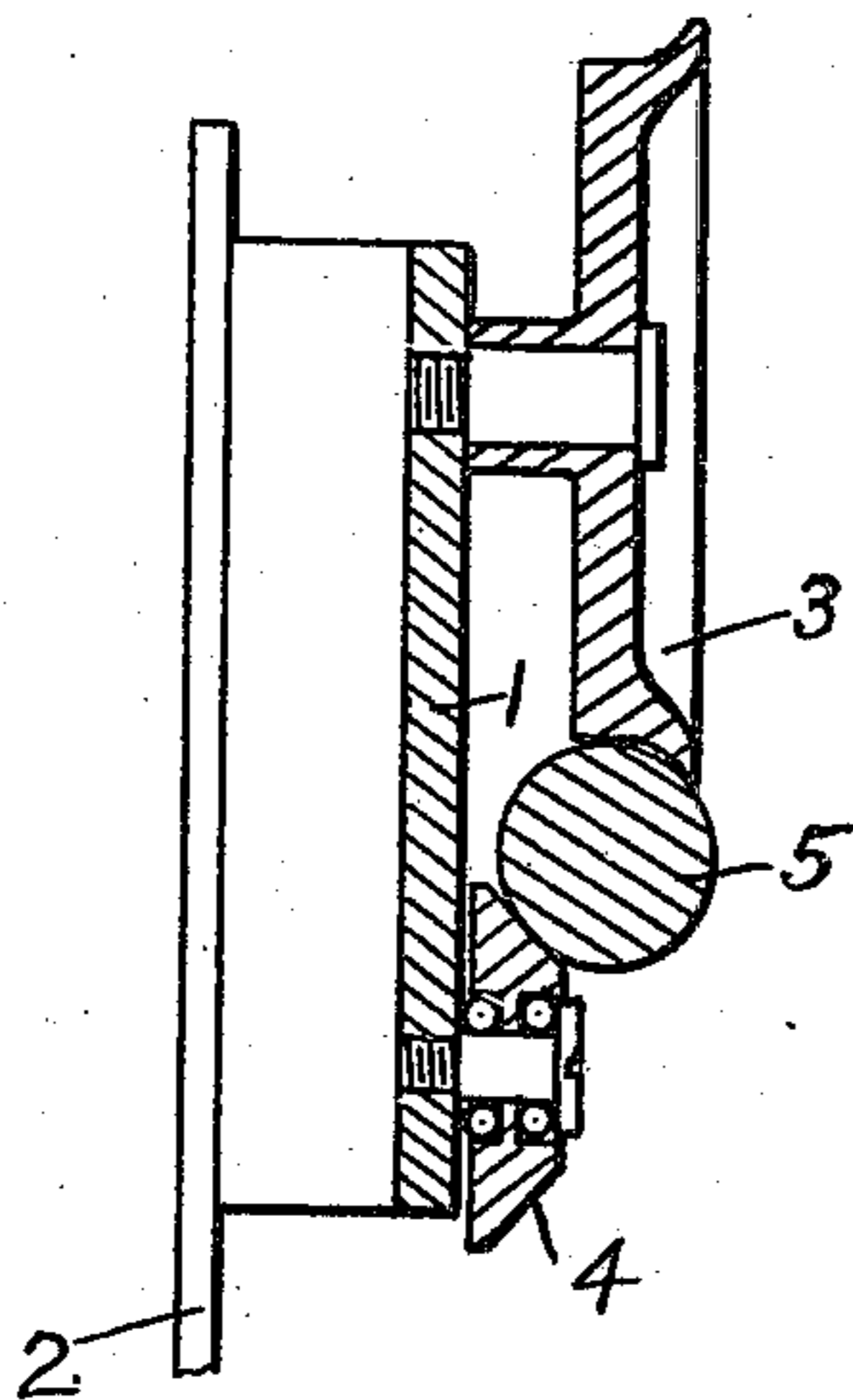


FIG. 2.

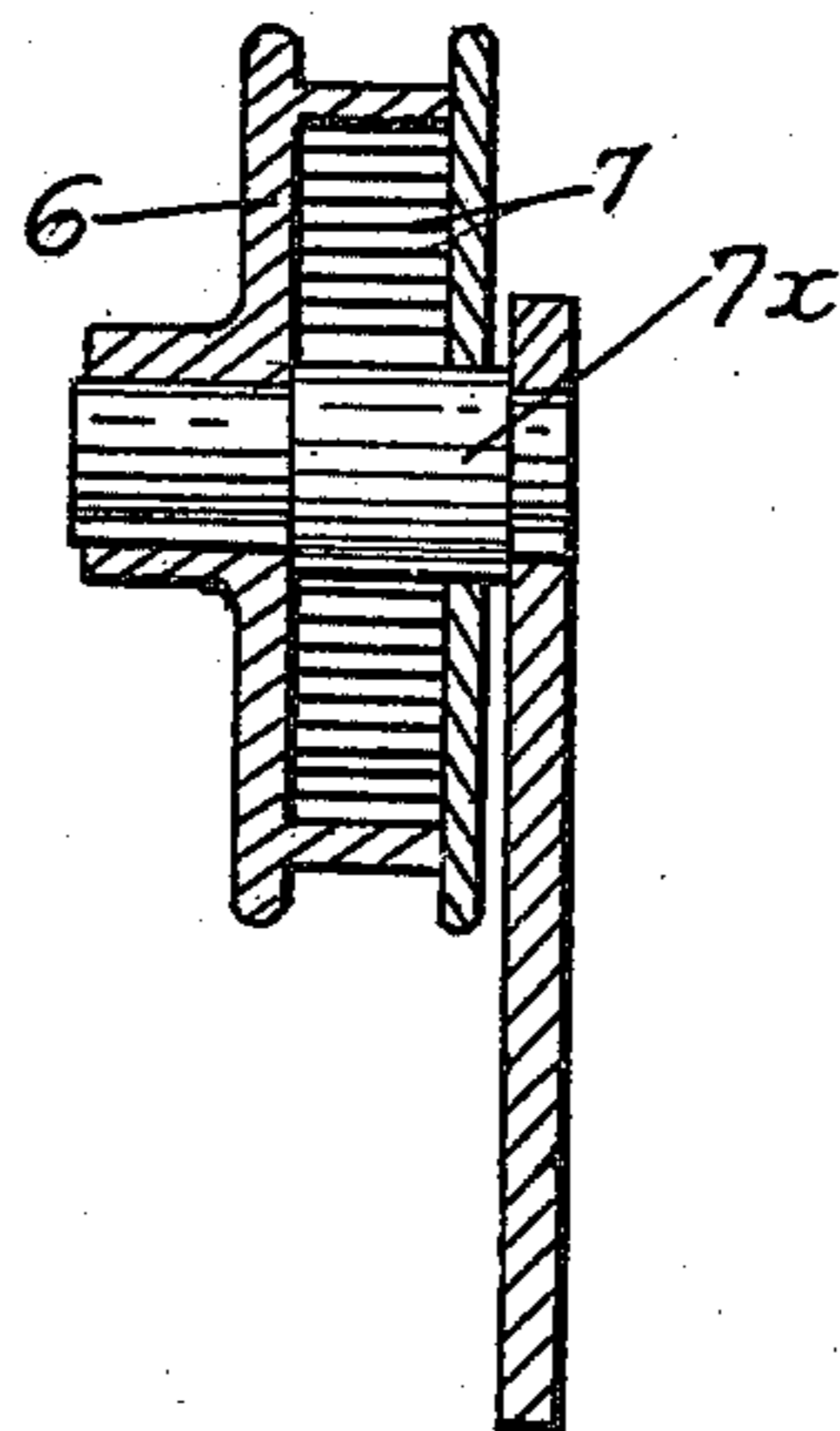


FIG. 3.

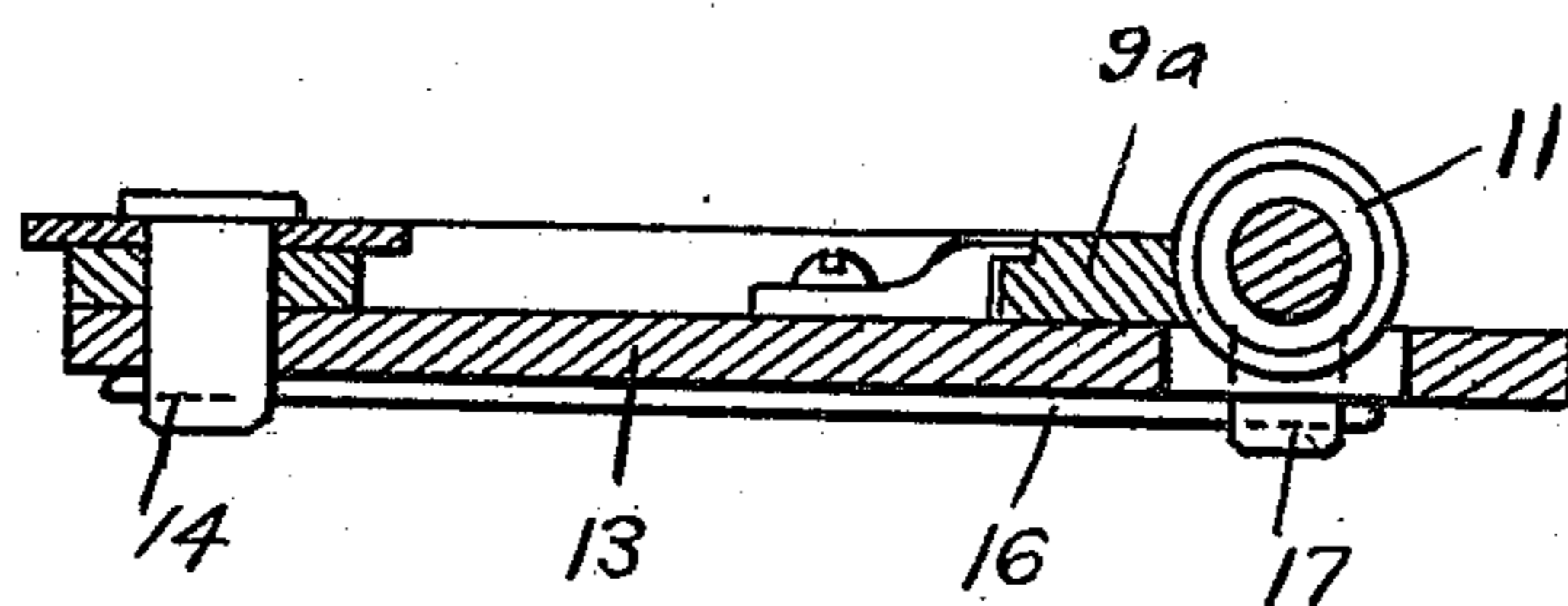


FIG. 4.

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# UNITED STATES PATENT OFFICE.

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## DRAFTING INSTRUMENT.

965,483.

Specification of Letters Patent. Patented July 26, 1910.

Application filed October 14, 1908. Serial No. 457,655.

*To all whom it may concern:*

Be it known that I, HENRY F. NOYES, a citizen of the United States, residing at Waynesboro, in the county of Franklin and State of Pennsylvania, have invented certain new and useful Improvements in Drafting Instruments, of which the following is a specification.

This invention relates to improvements in drafting instruments and has for its objects to provide a self-contained combination of the usual scales, triangle, protractor and T-square; and to balance this self contained combination so it shall be adapted for use at any angle of drawing board from the horizontal or flat board to the vertical. I attain these improvements by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of my improved drafting instrument; Fig. 2 is a section of the head taken on line *a—b* Fig. 1; Fig. 3 is a section of the head taken on line *b—b* Fig. 1; Fig. 4 is a section of the protractor taken on line *c—c* Fig. 1.

Similar figures refer to similar parts throughout the several views.

Referring to the drawings, for the purposes of description I have divided my improvement into three mechanisms; the head or T-square, the track on which the head is guided, and the sliding protractor.

The head includes a plate 1 to which a blade 2 is fastened, and which carries two guiding rollers 3, and two beveled or conical rollers 4, arranged in pairs at a suitable distance apart to guide the head upon a round track 5 as will be described farther on. The head also carries in a suitable drum 6 a coiled spring 7, fastened to a stud 7\* upon which the drum is pivoted, and upon the periphery of the drum is attached a cord 8 which is adapted to be fastened to a sliding protractor limb 9. The track 5 is fastened to the top edge of the drawing board by means of brackets 10. It will be evident from this description that the head is guided upon the track by the upper guiding rollers 3, and that as its weight chiefly rests upon the beveled rollers 4, the latter hold the guiding rollers firmly against the track so that no lost motion is possible, and at the same time a very free movement along the track is obtained. And the head being readily revoluble about the track the blade can

be easily raised to remove and replace paper upon the board.

The protractor includes the limb 9, to which is fastened a segment 9<sup>a</sup>, which is provided upon its periphery with teeth spaced a suitable distance apart and which a worm 11 is adapted to engage. This worm is journaled in a holder 12 which is pivoted in a forked arm 13, upon a projecting end 17.

The arm 13 is pivoted upon a pin 14 which is carried by the blade 9. A spring 16 is provided, comprising a wire entering a suitable hole in the pivoted end 17 of the holder 12 and also a similar hole in the pin 14, so that this spring is adapted normally to hold the worm in engagement with the protractor teeth.

The teeth of the segment are spaced a certain distance apart, preferably 3 degrees, and upon the worm end is a graduated collar 18, the graduations being arranged to give a reading of a fraction of a degree.

It is evident that for quick setting to all multiples of 3 degrees the worm can be disengaged from the segment and the forked arm swung to its proper position.

To facilitate setting the scale arm the segment is divided into degrees by suitable marks placed upon its surface, and indicated by figures stamped opposite to them.

Clamping screws are provided adapted to clamp suitable scales 20 to the fork.

The limb 9 is guided upon the blade 2, by means of two rollers 21, the tension of the cord 8 being always sufficient to hold the segment limb in contact with the blade, while the segment can be quickly disengaged from the blade if desired.

A distinct advantage accrues from this form of construction, for in drawing it is frequently desirable to quickly joint two points, or draw an independent line at no particular angle, in which case the top roller can be swung to the left, without taking the time to find and adjust the instrument to the proper angle, and when the limb is released the tension of the cord will quickly bring the protractor back to its normal position.

In operation the instrument is held between the thumb and first or second fingers by the lugs 22. These are arranged at such a location that when held in this manner the instrument will respond to any movement vertically or horizontally without disengaging it from the blade, yet by giving it

a slight twist it can be instantly disengaged. Thus it will be seen that the advantages of this invention are: A very freely moving head without lost motion; a blade which is short in proportion to the length of the head owing to the arrangement of the head at the top of the board instead of the side, which makes possible greater accuracy; a protractor sliding vertically or transversely of the board with a very free movement, and a means for balancing the weight of the protractor, whatever the angle of the drawing board; and a combination of protractor and scales readily set to any desired angle and at the same time capable of being quickly set to join points at no particular angle.

I claim—

1. In a drafting instrument in combination with a suitable segment having scales adjustably pivoted thereto; a blade adapted to guide said segment; a head fastened to said blade and provided with a spring balanced drum flexibly connected with said segment whereby to balance a portion of the weight thereof; and a track adapted to guide said head; as and for the purpose set forth.

2. In a drafting instrument, in combination with a track adapted to be fastened at the top of a drawing board; a head provided with a plurality of guiding rollers adapted to guide the head upon said track, one of said rollers having a conical surface adapted to rest upon said track whereby it is adapted to throw a portion of the weight of said head against another of said rollers; a blade carried by said head; and a segment adapted to be guided by said blade and provided with suitable scales; as and for the purpose set forth.

3. In a drafting instrument, in combination with a head provided with a suitable track, a blade fastened to said head at right

angles to said track, and a spring balanced drum carried by said head; a segment and a limb rigidly connected together and having suitable scales adjustably pivoted thereto, said limb provided with rollers adapted to guide the same upon said blade and said limb flexibly connected with said drum whereby the tension of said connection is adapted to hold said rollers in contact with said blade; as and for the purpose set forth.

4. In a drafting instrument, in combination with a head provided with a suitable track, a blade fastened to said head at right angles to said track and a spring balanced drum carried by said head; a segment and limb rigidly connected together and flexibly connected with said drum; a forked arm pivoted to said limb and provided with suitable scales; a pin carried by said limb and adapted to form a pivot for said arm; a worm adapted to engage said segment; a worm carrier pivoted in said arm; and a spring engaging said worm carrier and also said pin, said spring adapted to hold said worm in engagement with said segment; as and for the purpose set forth.

5. In a drafting instrument, in combination with a track and a head provided with suitable rollers adapted to guide said head upon said track and a blade fastened to said head; a segment and limb rigidly connected together and having suitable scales adjustably pivoted thereto, said limb provided with two rollers adapted to guide the same upon said blade, and an elastic means adapted to hold said rollers in engagement with said blade; as and for the purpose set forth.

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Witnesses:

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