

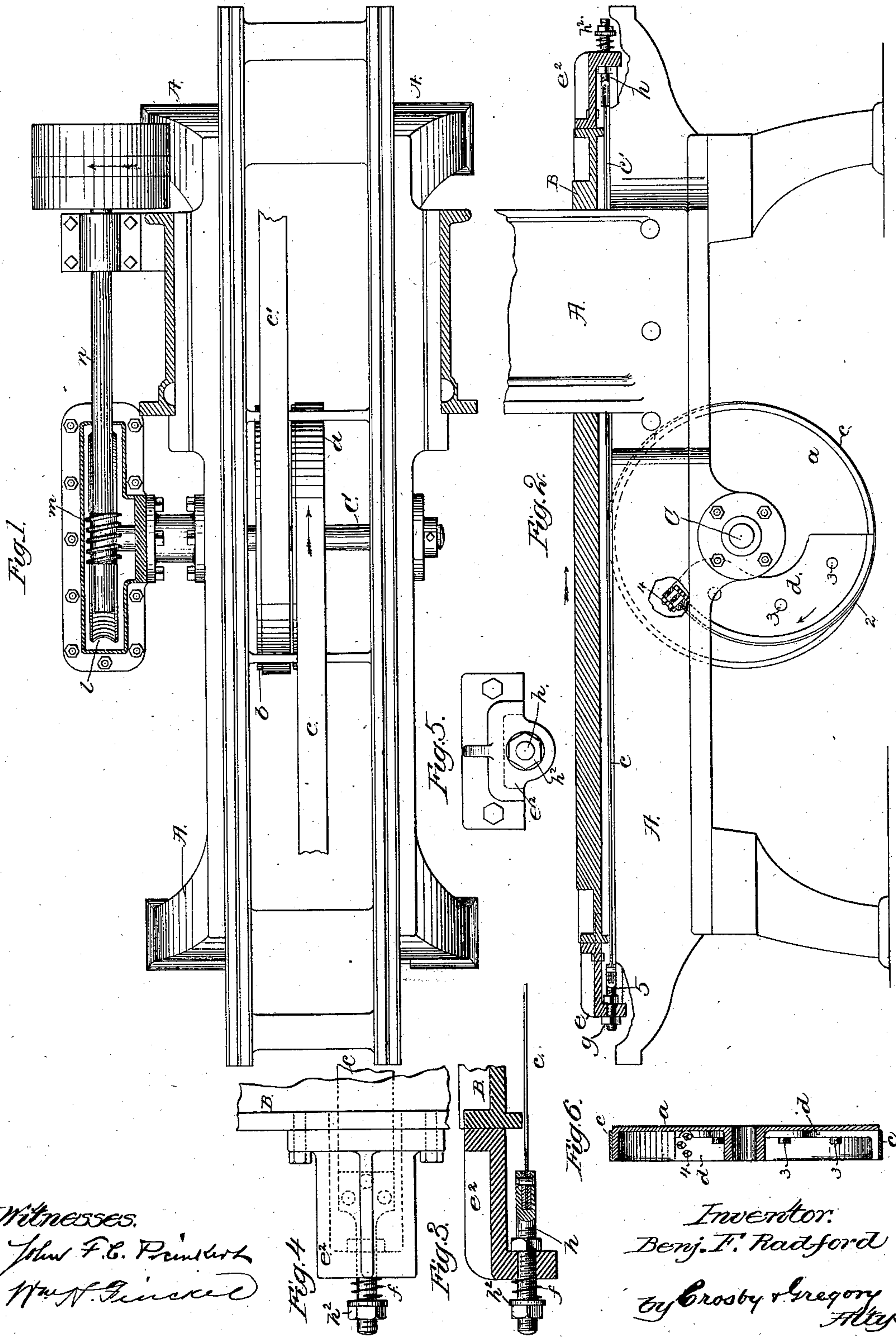
(No Model.)

B. F. RADFORD.

METAL PLANER.

No. 255,115.

Patented Mar. 21, 1882.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

BENJAMIN F. RADFORD, OF HYDE PARK, MASSACHUSETTS.

## METAL-PLANER.

SPECIFICATION forming part of Letters Patent No. 255,115, dated March 21, 1882.

Application filed January 7, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, BENJAMIN F. RADFORD, of Hyde Park, county of Norfolk, and State of Massachusetts, have invented an Improvement in Metal-Planers, of which the following description, in connection with the accompanying drawings, is a specification.

This invention in metal-planers relates to improvements in devices for reciprocating the planer-bed steadily and uniformly without the usual shock and jar attendant upon the employment of toothed gearing and racks. In the most common form of metal-planer a rack connected with the planer-bed is engaged by a toothed gear, which thus reciprocates the bed; but this is objectionable, as each tooth of the gear as it engages a tooth of the rack strikes, as it were, a blow, causing jar to the parts, and the more the wear and the looser the fit between their teeth the greater the jar. This jar sometimes becomes so great as to be readily noticeable on the metal being planed by the presence of small transverse ridges. To obviate the employment of toothed gear or wheels for this purpose, which results in shock or jar during the reciprocation of the bed, screws have been employed by some of the prominent manufacturers of metal-planers; but the screws are objectionable for such purpose because of the slow speed at which they operate the planer-bed. To get the greatest speed and entirely dispense with jar attendant upon moving the planer-bed I have attached smooth metal bands to the ends of the planer-bed, and having passed the opposite ends of the said metal bands in opposite directions, partially or wholly about the surface of two drums, I have attached the said ends to the said drums. The band secured to the rear end of the planer-bed to draw it backward will preferably be attached to the bed in a yielding manner through the instrumentality of a spring, so that the shock or strain resulting from the quick reversal of the movement of the planer-bed when started backward will not injuriously affect the planer, and so, also, that when one part of the band partially overlaps another part thereof, because wound more than once about the drum, as when the planer-bed is long, the yielding of the spring will compensate for the increase in diameter of the drum and band. These drums, with which the smooth metallic

bands are attached, are secured to a shaft which may have at one end a worm-toothed gear-wheel, which is engaged and actuated in first one and then in the opposite direction by a worm on a shaft placed parallel with the side of the planer-bed. The shaft has upon it the reversing-pulleys, which will be operated, all as usual, by open and crossed belts controlled by a belt-shifter to enable the shaft to be rotated in one or the other direction, or be left at rest.

Figure 1 represents in top view the frame of a metal-planer with the planer-bed removed to show the metal bands and the drums with which they are attached, the frame-work of the planer above the bed being broken off; Fig. 2, a partial side elevation and section of a metal-planer embodying my invention; Figs. 3, 4, and 5, enlarged details showing the manner of connecting one of the metal bands with the rear end of the planer-bed; Fig. 6, a vertical section taken through one of the drums.

The frame-work A of the planer is and may be of usual shape, as may be the planer-bed B, and the bed and frame will have the usual guides to insure the straight movement of the bed with the least friction. The frame-work has suitable bearings to receive the cross-shaft C, upon which are fixed the two drums *a b*, which are made as shells, as indicated in Fig. 6. Each drum has its flange or periphery slotted, as shown at 2, to admit the passage of one end of one of the smooth metal bands, *c* or *c'*, into its interior. Inside each drum, and connected with it by suitable bolts, 3, is a cam-plate, *d*, to one end of which, by bolts, as at 4, is connected one of the metal bands, *c* or *c'*, both drums being alike in the manner of the connection of its metal bands with it. The metal band *c*, connected with drum *a*, as shown in Fig. 2, is wrapped partially or wholly about the said drum, and connected with the bolt 5, extended through the flanged piece *e*, secured to the end of the bed B. The drum *a*, which receives the band that draws the planer-bed forward to carry the material against the tool being used, is located directly under the center of the bed B, so that the band draws squarely upon the bed. The band *c'* is connected with drum *b*, as described of band *c*, and wrapped partially or wholly about the drum *b* in the opposite direction from that represented by band *c*. It is con-



nected by bolt *h* and suitable nuts with the  
 rear end of the bed. In practice I prefer to  
 extend this bolt *h* through a spring, *f*, the lat-  
 ter thus occupying a position between the  
 5 flange of part *e*<sup>2</sup> and the nut *h*<sup>2</sup>, so that the shock  
 or strain on the machine, when the movement of  
 the planer-bed is to be reversed and moved  
 backward, may be greatly reduced, and so, also,  
 that the varying diameter of the drum and band  
 10 may be compensated for, as previously stated.

The shaft C has at one end of it, as I prefer,  
 a worm toothed gear, *l*, which is engaged by  
 worm *m* on shaft *n*, the latter being provided  
 with the usual reversing-pulleys to enable it  
 15 and the worm to be turned in either direction,  
 as it is desired to rotate the shaft C in one or  
 the other direction and cause the bands *c c'*,  
 secured to the drums *a b*, to draw the planer-  
 bed positively and steadily in one or the other  
 20 direction. By the employment of these bands,  
 preferably of sheet-steel, fitted closely to the  
 drums and kept properly strained, the move-  
 ment of the planer-bed is made most steady  
 and uniform without reducing its speed, and  
 25 there is no jar whatever, as when the planer-  
 bed derives its movement through a toothed  
 gear and a rack or equivalent. The metal  
 bands and drums are cheaper to construct than  
 are other devices heretofore used to move the  
 30 planer-bed, so far as known to me, are very  
 durable, and will last for an indefinite time  
 without repair of any sort. The employment  
 of the worm and worm-gear also adds to stead-  
 iness of movement of the parts.

Instead of the sheet-metal bands to fit the 35  
 smooth or untoothed drums, wire rope might  
 be employed with good results; but I prefer  
 to employ bands such as shown.

Instead of the particular devices employed  
 for driving shaft C, I might employ any other 40  
 well-known equivalent devices.

I claim—

1. In a metal-planer, the planer-bed and the  
 drums *a b*, combined with the metal bands con-  
 nected at one end with and passed about the 45  
 drums in opposite directions, and secured at  
 their other ends to the planer-bed.

2. The planer-bed, the drum *a*, and the  
 sheet-metal band *c*, combined with the bolt and  
 spring to form a yielding connection between 50  
 the bed and band, substantially as and for the  
 purpose described.

3. The planer-bed, the sheet-metal bands  
 connected therewith at one end, and the slot-  
 ted drums *a b*, combined with the cam-plates 55  
 within the said drums, with which the other  
 ends of the said bands are connected, sub-  
 stantially as shown and described.

In testimony whereof I have signed my name  
 to this specification in the presence of two sub- 60  
 scribing witnesses.

BENJ. F. RADFORD.

Witnesses:

G. W. GREGORY,  
 B. J. NOYES.