Jan. 24, 1933. J. D. HASKELL 1,895,188

BREAKER AND BEATER ROLL

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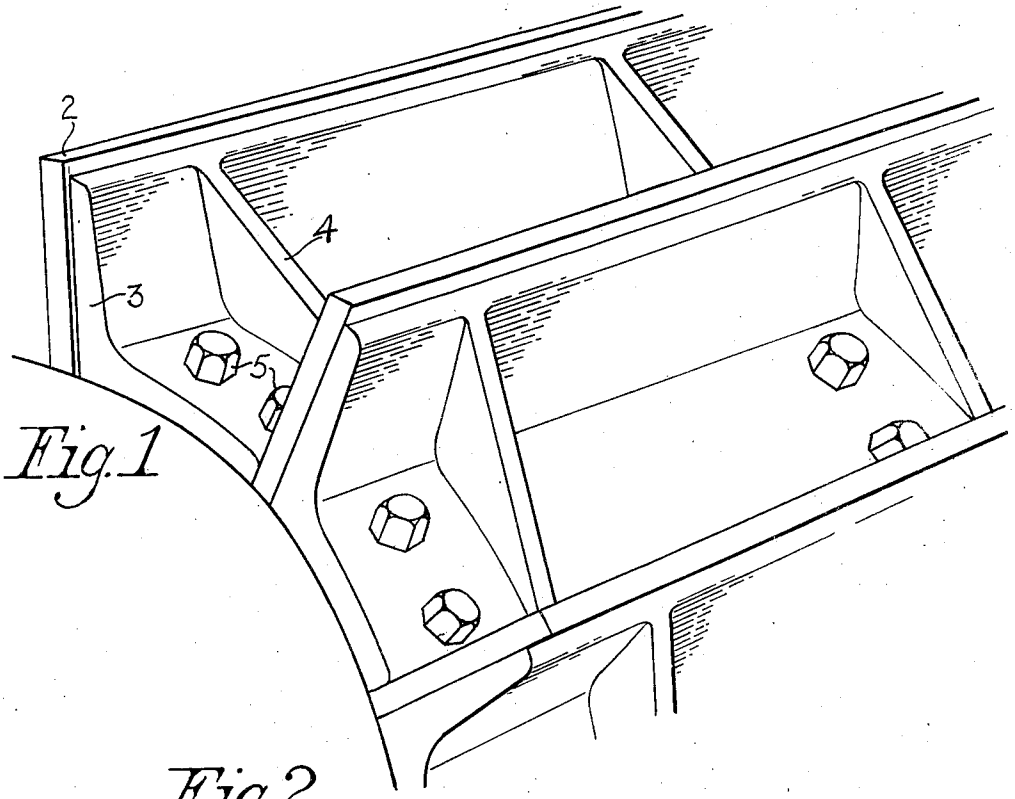


Fig. 1

Fig. 2

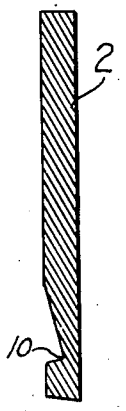
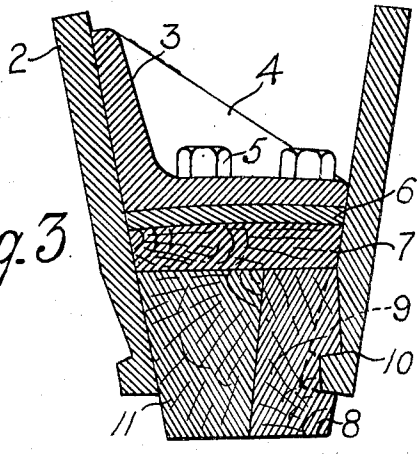


Fig. 3



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BREAKER AND BEATER ROLL

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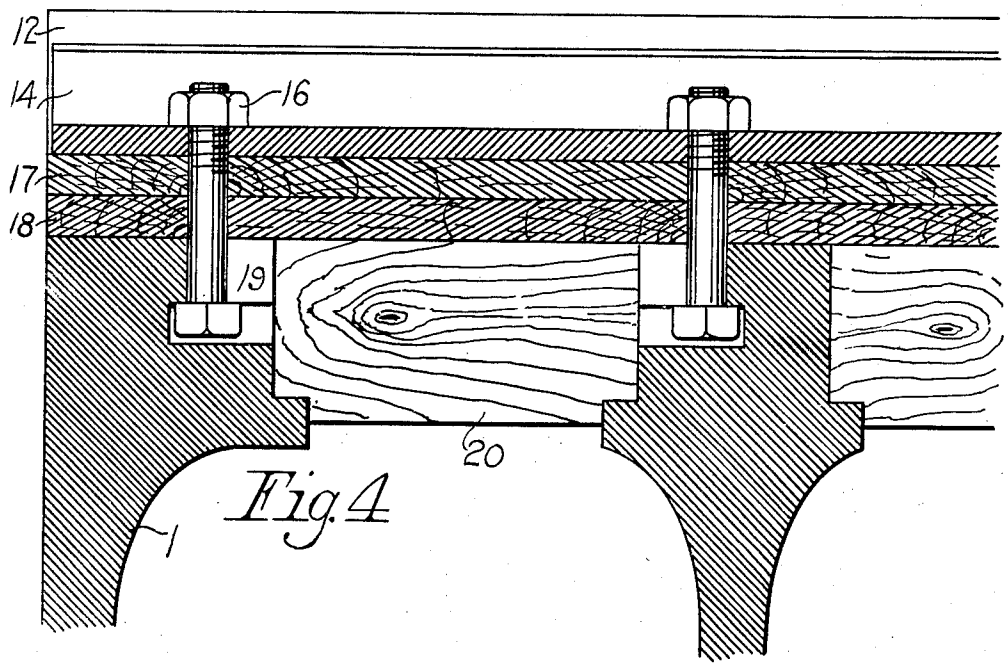


Fig. 4

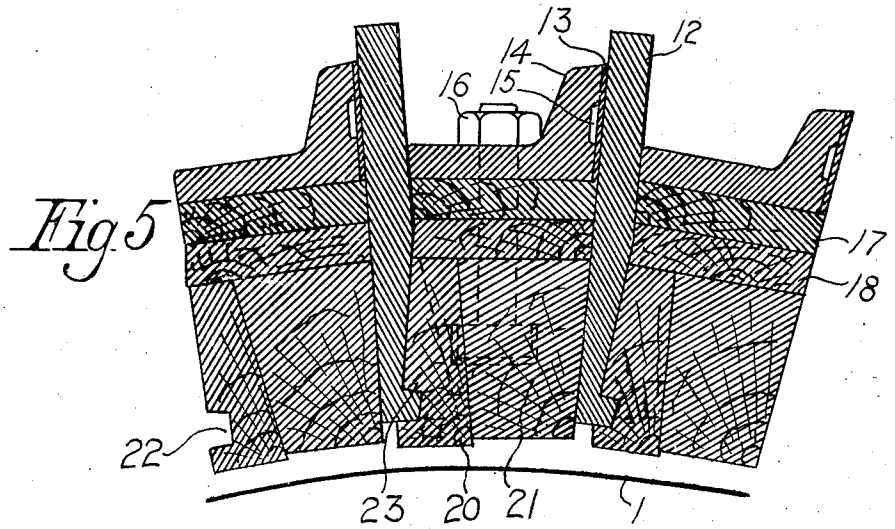


Fig. 5

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BREAKER AND BEATER ROLL

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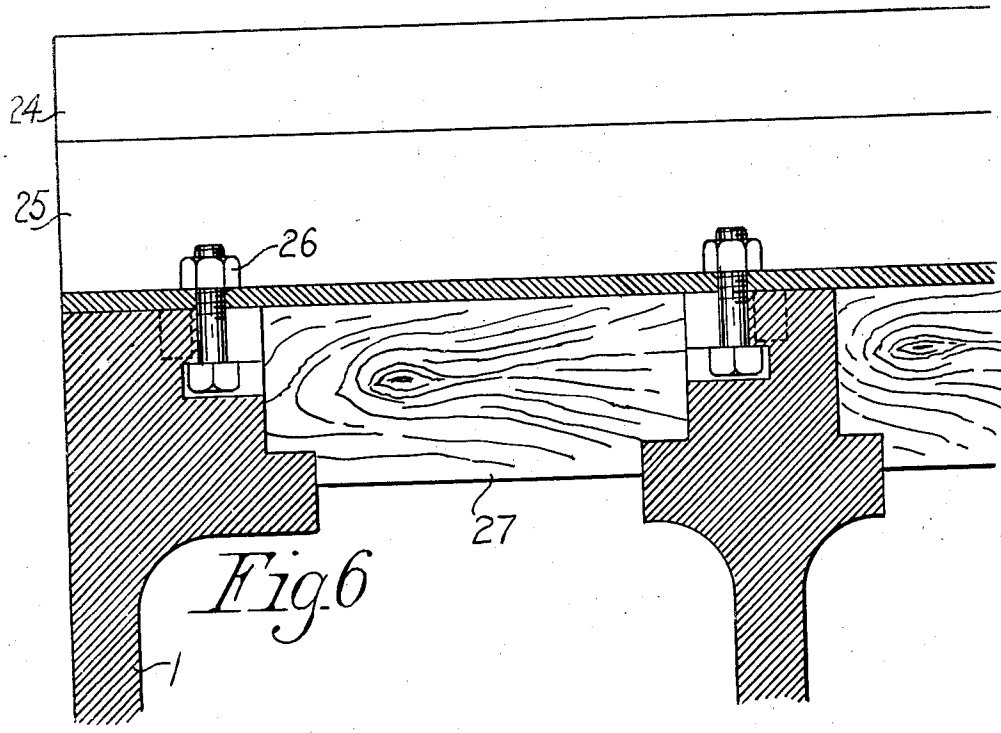


Fig. 6

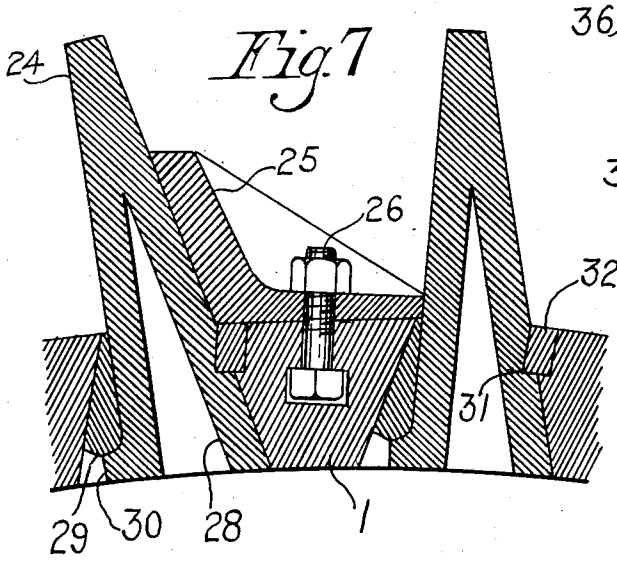


Fig. 7

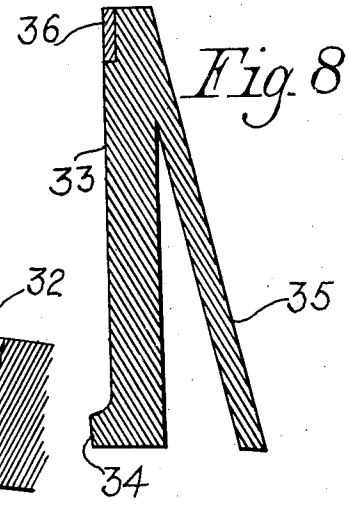


Fig. 8

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Patented Jan. 24, 1933

1,895,188

UNITED STATES PATENT OFFICE

JOHN D. HASKELL, OF FULTON, NEW YORK, ASSIGNOR TO DILTS MACHINE WORKS, INC., OF FULTON, NEW YORK, A CORPORATION OF NEW YORK

BREAKER AND BEATER ROLL

Application filed June 1, 1932. Serial No. 614,781.

This invention represents an improvement in breaker and beater rolls for paper pulp beaters as used in the preparation of paper stock made from rags, straw, wood fibre etc. More particularly the invention applies to a form of beater roll known as a breaker roll, the function of which is in a preliminary way to break up large wads of materials or bundles thereof preparatory to being furnished to finishing beaters or further refining apparatus.

On regular finishing beaters the fly bars wear down through their contact with the bed-plate located beneath the roll, whereas breaker rolls usually run with some space between the bed-plate and fly bars of the roll, and the bars usually project further from the body of the roll and are spaced further apart in order to provide a greater "bucket" action for the propelling of the stock. For this class of service it is necessary to use extremely heavy bars, and even then the bars are subjected to terrific impacts due to oversize wads of pulp, foreign substances such as stones, pieces of metal and the like, and such foreign bodies are apt to bend the bars back and thus they lose their effectiveness. Also where old rags, waste paper and other refuse are deposited in the beaters there is often a great amount of abrasive matter which, in combination with water, wears off the leading edges of the bars so that they quickly become rounded along such edges. This also in a great measure reduces the efficiency of the breaking effect of the roll and bars.

This invention comprises devices of special construction and arrangement for the re-enforcement of the roll fly bars, as well as for their individual formation and the means for securing the fly bars and supporting them in proper position upon the spider frames of the roll. The bracing members making a part of this invention and herein described and illustrated are believed to act to prevent the bars from bending over out near the cutting edge of the bars and bracing one bar against the next adjoining bar, at the same time leaving ample space between the bars for the circulation of the stock.

In the accompanying drawings constituting a portion of this application the construction of the various elements and their combined assemblage are illustrated. Fig. 1 is a fragmentary perspective view, showing the brace members secured against the fly bars. Fig. 2 is a longitudinal section of a fly bar used in one form of this invention. Fig. 3 is a cross section of two adjoining fly bars illustrating the wood filling and the location of the brace member to re-enforce the fly bar near its beating edge. Fig. 4 is a sectional view lengthwise through the wood filling and brace members, showing the supporting spiders also in section, and the bolts employed to secure the parts in place upon the spiders. Fig. 5 is a cross-section of the parts set out in Fig. 4 taken through the wood filling between the spiders. Fig. 6 represents a sectional view lengthwise of the brace member, showing the spiders in section, the location of the wood filling, and the arrangement of the bolts to secure the same with the fly bars upon the spiders. Fig. 7 is a cross section of the parts illustrated in Fig. 6 through the spider, brace member and modified fly bars secured thereupon. Fig. 8 is a sectional view of a further modified fly bar showing the protected edge.

Throughout the description and drawings the same number is used to refer to the same part.

It is not intended to limit this invntion to the precise relative sizes of the parts shown, or to any particular materials or exact formations, as such features may be readily changed by those familiar with this subject.

Considering Fig. 1 as showing the positions of the parts, the spider 1 engages the fly bars 2, and between the bars are placed the brace members 3 usually made with integral spaced stiffening struts 4 and secured to the spider by bolts 5.

In Fig. 3 is a shown a metal plate 6 which may be employed below the brace member and upon the wood filling such as the flat top piece 7 and one of the lower pieces 8. The reference number 9 in Fig. 3 refers to a wedge that engages an angular recess 10 in the side of the fly bar 2. The like element to wedge 9

will be described more in detail later in this description. A second wood filling piece 11 is set forth in Fig. 3. In this figure of the drawings it will be noted that the brace member 3 re-enforces the fly bar 2 near the upper and outermost end which is subjected to the heaviest blows in operation.

Considering Fig. 4 the fly bar 12 is of the same general shape as before, and the spider 1 is the same. In this arrangement of the invention, as best illustrated in Fig. 5, a plate 13 of hard metal is fitted against the fly bar and the brace member 14 is placed against the plate which gives somewhat elastically and insures proper contact of the brace member and fly bar. The face of the brace member may have a small recess 15 to further aid in the fitting of the parts together. The bolts 16 are used to secure the wooden filling caps 17 and 18 in place as illustrated upon the spiders, and the bolts are shown in engagement with recesses 19 in the spiders in Fig. 4. The lower wooden filling pieces are designated by numbers 20 and 21. It will be noted in Fig. 5 that the fly bars as they are arranged present to each other surfaces that diverge somewhat, and the brace member when the bolts are set up may have a partial wedging action. When one bar receives the force of a blow by impact upon its cutting edge the effect of the blow is carried back through the brace member against the next adjacent fly bar near the point where the adjacent bar is fastened into the heads or spiders. This improvement is intended solely to act as a supporting brace for the fly bar out near the cutting edge to prevent the bar from bending back, which occurs regardles of how much bracing might be applied at the bottom of the space between the bars or at the top of the wood filling. In Fig. 5 it will be noted that the lower filling piece 20 has a recess 22 formed to engage the toe 23 at the lower end of the fly bar 12.

In Fig. 6 a modified fly bar 24 is shown, having the shape illustrated in Fig. 7. The spiders 1 are the same, and the brace members 25 and securing bolts 26 substantially as before specified. The wood filling 27 is also of like nature. The fly bar in Figs. 7 and 8 is of an inverted V type, in which the leading or body portion is substantially in axial alignment with the center line of the roll. In this construction a severe blow at the cutting edge on the leading side of the fly bar will be transmitted down the slanting leg 28 of the V and be taken up by the beater heads or spiders. Likewise, a part of the blow is absorbed by the brace members and transmitted to the next bar. In a breaker and beater roll constructed along the lines as set out in Fig. 7 the bars would be inserted into the dovetail recesses of the spiders from the end, and then the metal keys or wedges 29, such as the mentioned wedge 9, are driven into the remaining space in the dovetail recess above the toe 30 of the fly bar 24, which effectively secures each fly bar in the head or spider 1. In Fig. 7 is also shown an anuglar recess 31 in the outer surface of the leg 28 of the fly bar 24, and this recess is adapted to receive a small plug 32 that may be termed a locking plug, driven in after the bars are fastened to the spiders. This would prevent the bars from moving endwise during the operation.

Fig. 8 of the drawings illustrates a slightly modified fly bar contemplated for use in this invention. The body of the bar 33 has a toe or extension 34 at the lower end, and an inclined supporting leg 35 which is like the leg 28 already described. The construction is practically the same as before but with a groove cut away on the leading edge of the bar, and this groove is so formed that the space from which the metal has been removed may be filled with an extremely hard and tough metal, preferably such as stellite, which can be fused into the groove by means of oxy-acetylene welding or other welding process. Since the greater part of the wear due to abrasion comes at the very leading edges of the bars, a comparatively small insertion of this extremely hard metal is effective in resisting wear at this point and prolongs greatly the useful life of the bar. The inserted metal is marked 36 in Fig. 8.

The operation of this invention is the same as that of any breaker roll, and it is thought that by suitably bracing the fly bars near the cutting edge on one side as explained, and particularly by employing the inverted V-form bar the bending back of the cutting edges of the bars will be almost eliminated and the life of the roll materially increased with consequent and obvious economy in actual service.

Having now described this invention and the manner of its use, I claim:—

1. In a beater and breaker roll, the combination with internally disposed supporting spider frames, of fly bars carried by the spiders, filling pieces arranged between said bars, bracing members arranged between said bars and upon said filling pieces, the said brace members having extended portions on one side thereof and arranged to brace the upper outermost end portions of the fly bars on one side thereof, and means securing the filling pieces and brace members to said spiders.

2. In a beater and breaker roll, the combination with internally disposed supporting spiders, of spaced fly bars carried by the spiders, filling pieces arranged between said bars, said filling pieces being composed of separable metal and non-metal pieces, bracing members externally placed between said bars and upon said filling pieces, the said brace members having extended portions on one side thereof and arranged to brace the

upper outermost end portions of the fly bars on one side thereof, and means securing the filling pieces and brace members to the said spiders.

3. In a beater and breaker roll, the combination with internally disposed supporting spiders, of spaced fly bars carried by the spiders, filling pieces arranged between said bars, said filling pieces being composed of separable upper and lower pieces, the upper pieces overlying the lower pieces, said fly bars having each a toe projection, one of said lower filling pieces having a recess fitting the toe projection of a fly bar, bracing members exteriorly placed between said bars and upon said filling pieces, the said brace members having extended portions on one side thereof and arranged to brace the upper and outermost end portions of the fly bars on one side thereof, and means securing the filling pieces and brace members to the said spiders.

4. In a breaker and beater roll, the combination with internally disposed supporting spiders, of spaced fly bars in engagement with the spiders, filling pieces arranged between said bars, said fly bars having each a projecting toe, means engaging the toes of the bars and the said spiders to retain the bars, bracing members arranged between said bars and upon said filling pieces, the said brace members having extending portions on one side thereof and arranged to brace the upper outermost end portions of the fly bars on one side thereof, and means securing the filling pieces and said brace member to said spiders.

5. In a breaker and beater roll, the combination with internally disposed supporting spiders, of spaced fly bars in engagement with the spiders, filling pieces arranged between the bars, bracing members arranged between the bars and upon said filling pieces, the said bracing members having extended portions on one side thereof, a metal plate placed against the said fly bars on one side thereof and the said extended portion of the brace members being placed against said plate thereby bracing the upper outermost end portions of the fly bars on one side thereof, and means securing the filling pieces and brace members to said spiders.

6. In a breaker and beater roll, the combination with internally disposed supporting spiders, of spaced fly bars in engagement with the spiders, filling pieces arranged between the bars lengthwise and supported by said spiders, bracing members arranged between said bars and upon said filling pieces, the said brace members having extended portions on one side thereof and arranged to brace the upper and outermost end portions of the fly bars on one side thereof, and means securing said brace members to the spiders thereby holding the said filling pieces in place upon the said spiders.

7. In a breaker and beater roll, the combination with internally disposed supporting spiders, of radially extending spaced fly bars in engagement with the spiders, the upper portions of the fly bars presenting divergent surfaces towards each other, filling pieces arranged between the bars lengthwise and supported upon the spiders, bracing members fitting the divergent surfaces between the bars and resting upon said filling pieces, the said brace members having extended portions on one side thereof and arranged to brace the upper outermost end portions of the fly bars on one side thereof, and means for securing said brace members to the spiders thereby holding said filling pieces in place and exerting a wedging action upon said bars.

8. In a breaker and beater roll, the combination with internally disposed supporting spiders, of spaced fly bars carried by the spiders, said bars and spiders having on opposite sides of the bars openings adapted to receive locking elements, locking elements constructed to engage said openings, filling pieces arranged between the bars lengthwise and supported by the spiders, bracing members arranged between said bars and upon said filling pieces, the said brace members having extended portions on one side thereof and arranged to brace the upper outermost end portions of the fly bars on one side thereof, and means for securing the filling pieces and brace members to said spiders.

9. In a roll of the character described, a fly bar having a main body portion provided with an upper stock breaking part and portions extending in two directions from the body, in combination with a spider having devices formed to engage said extensions of the body to secure the fly bar upon the spider.

10. In a roll of the character described, a fly bar having a main body portion provided with an upper stock breaking surface and a part extending from the body on the opposite side from said surface to re-enforce the body, in combination with a spider having devices formed to engage the said body and extension of the body to secure the fly bar upon the spider.

11. In a roll of the character described, a fly bar having a main body portion provided with an upper stock breaking surface and a part extending downwardly from the body on the opposite side from said surface to re-enforce the body, in combination with a spider having devices formed to engage the said body and extension of the body thereby securing the fly bar upon the spider.

12. In a roll of the character described, a fly bar having a main body portion provided with an upper stock breaking surface and a part extending downwardly from the top of the body in an inclined direction on the op-

posite side from said surface to re-enforce the body, in combination with a spider having devices formed to engage the said body and extension of the body to secure the fly bar upon the spider.

13. In a roll of the character described, a fly bar having a main body portion provided with an upper stock breaking surface and an inclined integral part extending from the body on the opposite side from said surface to re-enforce the body, in combination with a spider having devices formed to engage said body and the extension of the body to secure the fly bar upon the said spider.

14. In a roll of the character described, a fly bar having a main body portion provided with an inclined part extending from the body on one side thereof to re-enforce the body, in combination with a spider having devices formed to engage the said body and extension of the fly bar, and an external brace member secured to the spider against the said extension of the fly bar to secure the fly bar upon the spider.

15. In a roll of the character described, a fly bar having a main body portion provided on one side with an upper stock breaking surface and an inclined part extending from the body on the opposite side from said surface to re-enforce the body, in combination with a spider having a dove-tail recess adapted to engage the said body portion and extension of the fly bar, and a wedge engaging the said recess of the spider and the body of the fly bar to secure the fly bar upon the spider.

In testimony whereof, I affix my signature.

JOHN D. HASKELL.