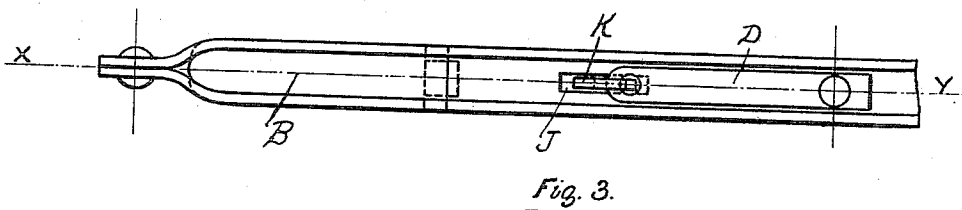
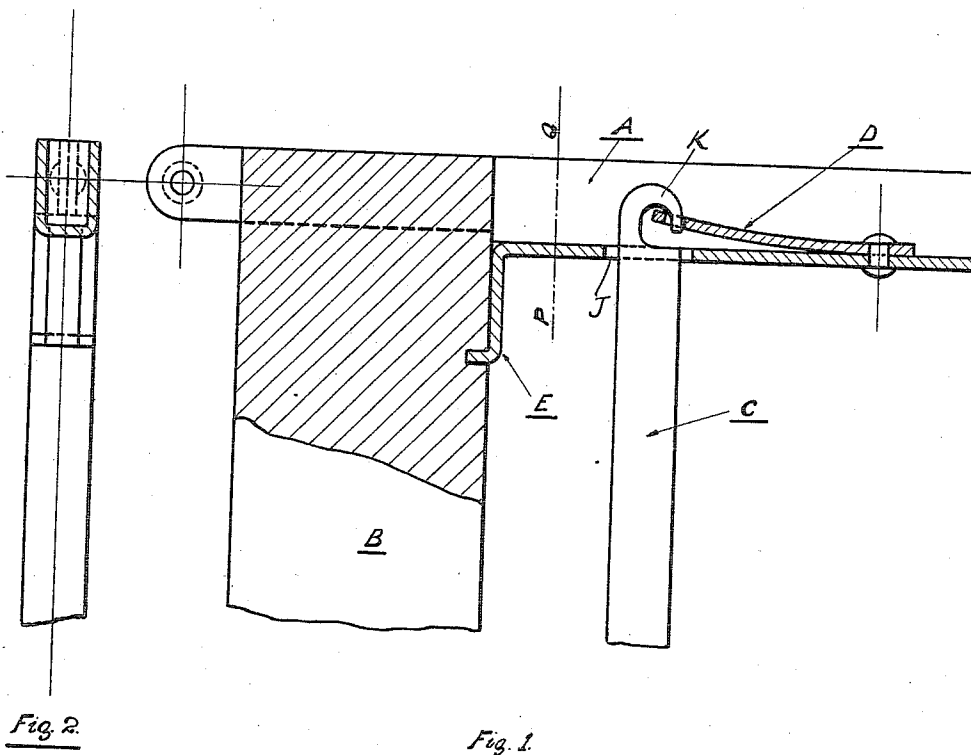


G. NUTTALL.
 HEDDLE FRAME.
 APPLICATION FILED NOV. 18, 1908.

971,551.

Patented Oct. 4, 1910.

2 SHEETS—SHEET 1.



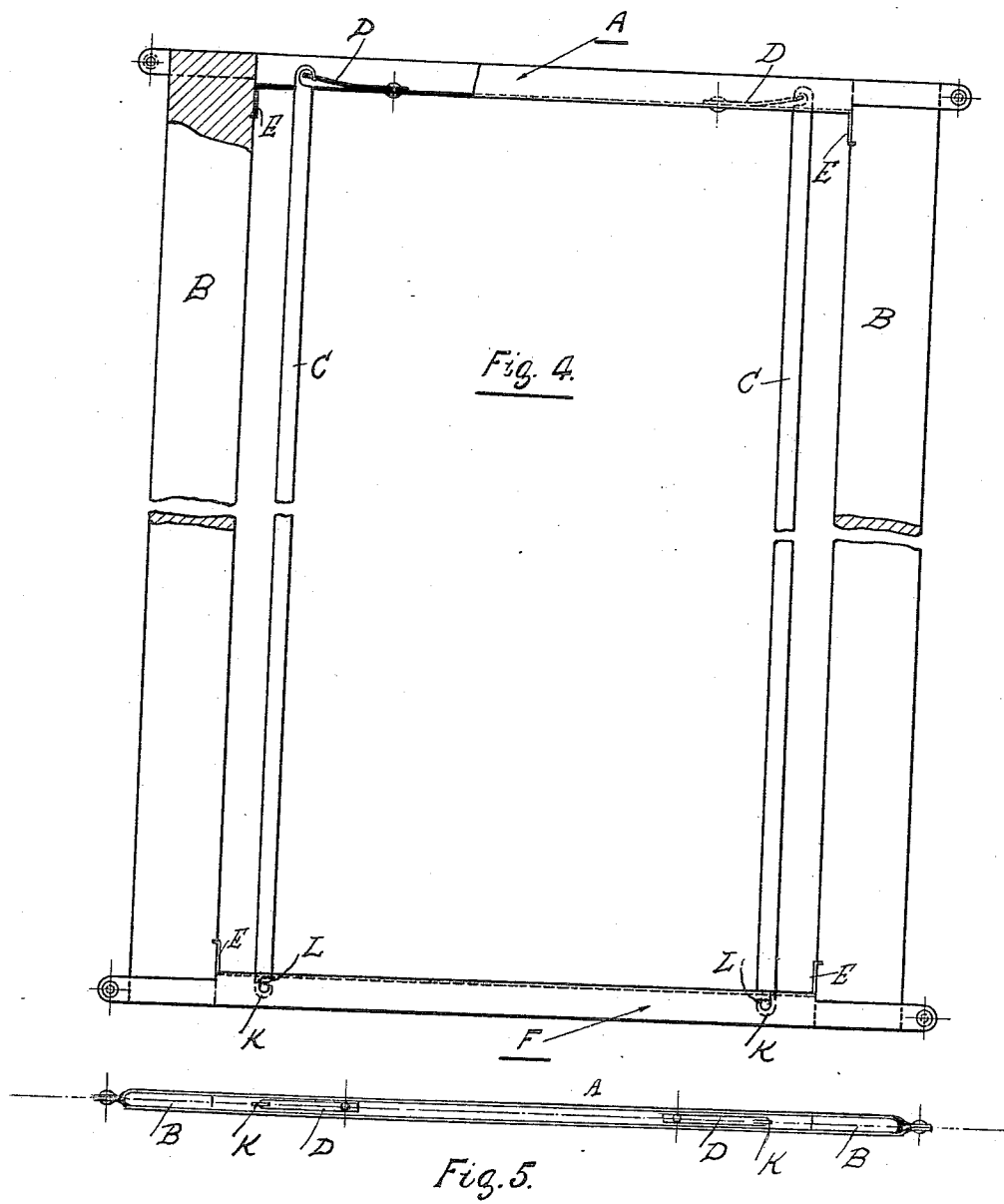
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 INVENTOR.

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WITNESSES:
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UNITED STATES PATENT OFFICE.

GEORGE NUTTALL, OF CHESTER, PENNSYLVANIA.

HEDDLE-FRAME.

971,551.

Specification of Letters Patent.

Patented Oct. 4, 1910.

Application filed November 18, 1908. Serial No. 463,251.

To all whom it may concern:

Be it known that I, GEORGE NUTTALL, a citizen of the United States, residing at Chester, in the county of Delaware, in the State of Pennsylvania, have invented an Improved Heddle-Frame, of which the following is a specification.

My invention relates to heddle frames and consists of a novel construction of heddle frame wherein the heddle rods are secured in position in such a manner that they are always under tension.

It further consists of a novel construction of a heddle frame wherein the stile or end piece, to which the cross rods are secured, is formed preferably of an integral piece of material which is deflected in such a manner as to form a chamber, adapted to receive the ends of the cross rods and also the fastening devices whereby the said rods are adjustably secured in assembled position.

It further consists of a novel construction of stile or end piece consisting preferably of an integral piece of metal which is bent to form a U-shaped portion, the bottom of which is provided with a slot to receive the ends of the heddle rods, and wherein a spring is secured to the stile in such a manner as to be wholly contained within the chamber formed by the outwardly deflected sides, and in such a manner that the said spring will exert a yielding pressure on the end of the rods, which latter are detachably secured thereto.

It further consists of a novel manner of securing my novel construction of end stile to the cross rods whereby a very rigid and advantageous construction is produced.

It further consists of other features of construction, all as will be hereinafter fully set forth.

For the purpose of illustrating my invention I have shown in the accompanying drawing one form thereof which is at present preferred by me, since the same has been found in practice to give satisfactory and reliable results although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

Figure 1 represents a sectional view on

line $x-y$, Fig. 3 showing a portion of a heddle frame embodying my invention. Fig. 2 represents a section on line P-Q, Fig. 1. Fig. 3 represents an end elevation of a portion of the heddle frame. Fig. 4 represents an elevation of the heddle frame partly in section. Fig. 5 represents an end view thereof.

Similar letters of reference indicate corresponding parts in the figures.

Referring to the drawings: A and F designate the stiles or end pieces of my heddle frame, the same being formed of any suitable material and preferably U-shaped in order to form a chamber or channel having one side thereof open and the opposite side from the open side being provided with apertures J through which the ends of the heddle rods C pass, as will be hereinafter described.

The end pieces are formed in any suitable or desired manner and have the strip E bent therefrom in order to form a connection or connecting piece for the cross rails B, it being understood that the ends of said cross rails B are suitably connected with the end pieces A and F by means of the extensions E, in the present instance a portion of the extension being driven into engagement with the cross rails, it being noted that the ends of the cross rails do not project beyond the outer edge of the end pieces but are preferably flush therewith, as best understood from Figs. 1 and 4. The heddle rods C are provided with hooks K at opposite ends and are adapted to pass through the apertures J in the end pieces in order that the hooks K at one side of the heddle frame may be engaged with pins L or other suitable means, for detachably holding these ends of the heddle rods in proper position with respect to this end piece F, it being noted that the ends of the heddle rods are seated within the channel or chamber of the end piece F in the present instance. The opposite end of the heddle rods pass through the apertures J in the end piece A and seated within the channel of said end piece and suitably secured thereto is a locking spring D which is adapted to be engaged by the hook K of the heddle rods C in order that the said spring will exert a yielding pressure on the ends of the rods and yet hold the same properly in position.

Attention is called to the fact that the

springs and ends of the heddle rods are entirely contained within the chamber or channel formed by the end piece A.

From the above it will be understood that
 5 I have provided a heddle frame which is rigid in construction; that I provide a suitable tension for the heddle rods and that I provide the chambers or channels in the end
 10 pieces to receive the ends of the cross rods and of the heddle rods in order that the same may be seated within the channel or chamber so that the edges of the end pieces have no projecting portions, the advantages of which are evident to those skilled in the
 15 art.

What I claim is—

1. In a device of the character stated, channeled end pieces, cross rails secured thereto with the ends within the channels, a
 20 heddle rod having one end detachably secured to one of said end pieces within the channel, and yielding means seated within the channel of the other end piece and adapted to engage with the end of the heddle rod,
 25 whereby a tension is exerted upon the latter.

2. In a device of the character stated, channeled end pieces having apertures therethrough, cross rails secured to said end
 30 pieces with the ends of said cross rails seated in the channels, a heddle rod having one end passing through an aperture in one of said end pieces and adapted to be seated within the channel and engage with said
 35 end piece, the opposite end of said heddle rod passing through an aperture in the other end piece, and yielding means carried by the last mentioned end piece and seated within the channel and adapted to engage with the
 40 end of said rod within the channel whereby a tension is exerted upon said rod.

3. In a device of the character stated, channeled end pieces having apertures therein, cross rails secured thereto having the
 45 ends thereof seated within the channels, pins suitably connected with one of said end pieces adjacent the apertures thereof, heddle rods passing through the apertures of
 50 said end piece and engaged with said pins within the channel, the opposite ends of said heddle rods passing through the apertures of the other end piece and being seated within the channel, and yielding means seated
 55 within the channel of the said opposite end piece and engaging with the ends of the heddle rods for yieldingly holding the same in proper position.

4. In a heddle frame, the combination of cross pieces and U-shaped end pieces secured

thereto, said end pieces having apertures therethrough, heddle rods passing through
 60 said apertures and detachably secured at one end to one of said end pieces within the channel thereof, and spring means secured within the channel of the other end piece
 65 and adapted to engage with the ends of said heddle rods within the channel for yieldingly securing the rods with respect to the frame.

5. In a heddle frame, the combination with channeled end pieces, of cross rails,
 70 said end pieces having strips deflected therefrom and secured to said cross rails, and said end pieces having apertures at suitable points, heddle rods adapted to pass through
 75 said apertures, means on one of the end pieces for engagement with one end of a heddle rod, and yielding means on the other
 80 of said end pieces for engagement with the other end of the same heddle rod, both of said means being seated within the channels
 85 of said end pieces.

6. In a heddle frame, the combination with U-shaped end pieces having their ends
 90 provided with apertures near each end, of cross rails passing through said apertures and having their ends flush with the sides of the end pieces, said end pieces having a
 95 portion thereof near each end outwardly deflected, means for securing said outwardly deflected portions to the cross rails, said end
 100 pieces having slots through the bottom thereof, heddle rods adapted to pass through said slots, means located within one of said
 105 end pieces for securing one end of the heddle rod thereto, and means secured within the other of said end pieces for securing the
 110 other end of the heddle rod in position.

7. In a heddle frame, the combination with channeled end pieces, of cross rails,
 115 said cross rails being suitably secured to said end pieces, said end pieces having apertures at suitable points, heddle rods adapted to pass through said apertures, means on one
 120 of the end pieces for engagement with one end of a heddle rod, and yielding means on the other of said end pieces for engagement
 125 with the other end of the same heddle rod, both of said means being seated within the channels of said end pieces.

In testimony whereof I have signed my
 130 name to this specification in the presence of two subscribing witnesses.

GEORGE NUTTALL.

Witnesses:

S. EDWARD MITCHELL,
 F. A. SLIGHT.