

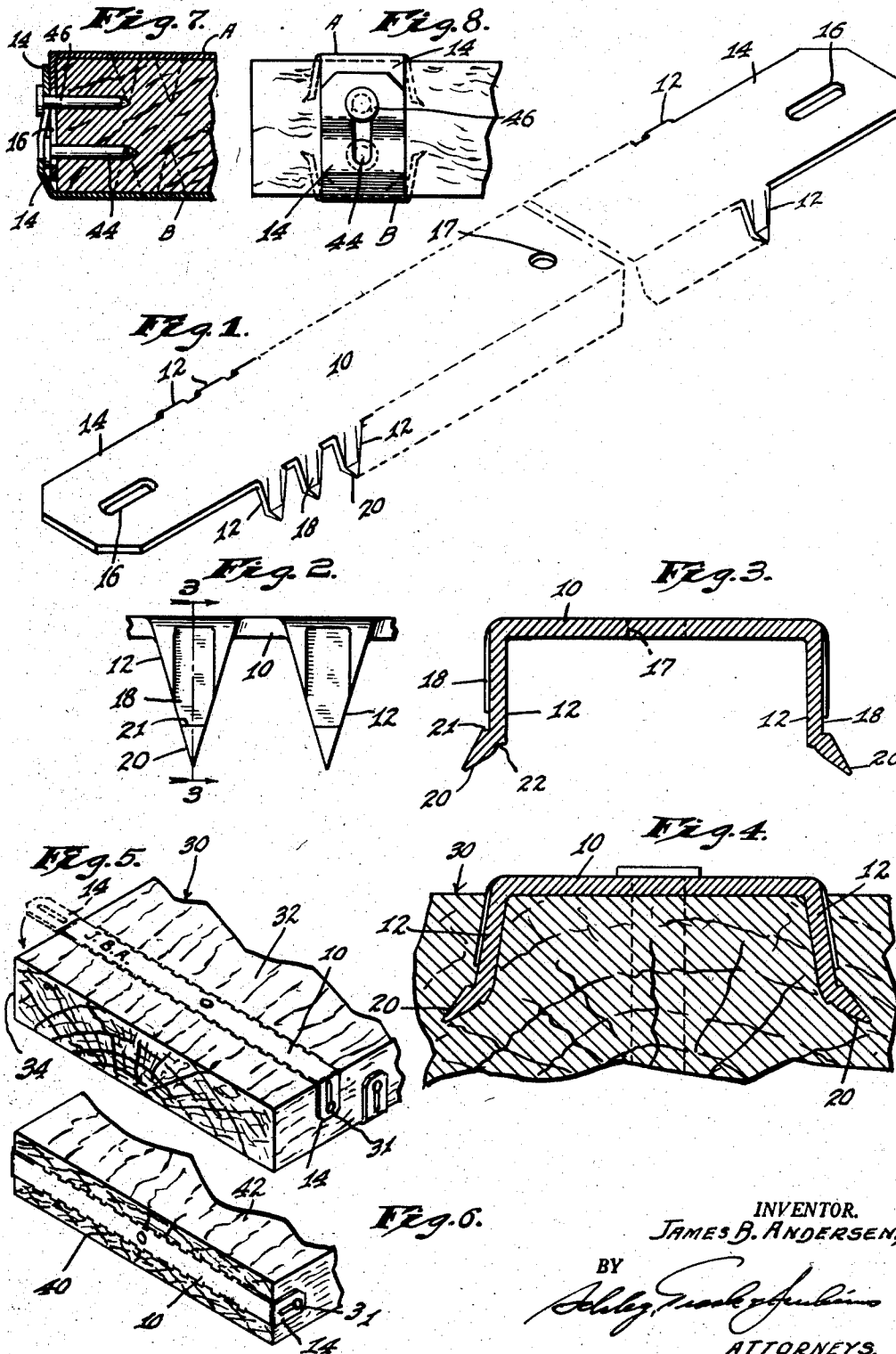
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PLANK PROTECTOR WITH COLD WORKED DEFLECTING TEETH

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1

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PLANK PROTECTOR WITH COLD WORKED DEFLECTING TEETH

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2 Claims. (Cl. 85—11)

This invention relates to a device for protecting planks from splitting and for repairing planks which have already split.

It is an object of the invention to protect and preserve planks such as those used for scaffolding, bleachers, etc., which are exposed to the weather and may be subject to rough handling. It is an object of the invention to provide a strap like device which can be easily applied to such planks, as at their ends, to bind and reinforce the ends against splitting, and which can be similarly applied to damaged or split planks to repair and preserve them. It is an object of the invention to provide a reinforcing and strengthening strap which can be easily and quickly applied to a plank and which will be firmly and securely held thereon and which will not interfere with the normal handling and use of the plank. It is an object of the invention to provide such a plank protecting strap having teeth along its side edges which will secure the same to the plank securely over the whole width of a plank face and in which the teeth are specially formed for strength and secure engagement in the body of the plank. It is an object of the invention to provide such a strap having a row of teeth along each of its side edges, with the teeth arranged to be driven into the plank at spaced points across its grain and to present their broad faces in end-grain abutting relation with the wood fibers of the plank to securely interlock therewith, and with the opposite teeth so formed that they spread as they are driven and cooperate to lock the protecting strap against the face of the plank.

In accordance with the invention, a strap like element is stamped or punched from relatively heavy gauge sheet metal, with its edges notched to form outwardly projecting spaced teeth along each side edge of the main body of the strap, and with end portions of the strap projecting beyond the tooth body with such end portions free of teeth. Stamping operations inherently tend to form a rounded corner at one face of the sheet and a sharp or finned corner at the opposite face of the sheet. In accordance with the invention, the stamping operations are preferably carried out in a manner which disposes the sharp edges or corners at what will become the outer faces of the teeth. The outwardly projecting teeth are then bent downward from the sharp-corner side of the blank to position the teeth generally perpendicular to the body of the strap. The lines about which the tooth bending occurs preferably extend longitudinally of the strap, and desirably all the teeth at each side of the strap are bent downward on a common bend line substantially coincident with the side edge of the strap. The bending operation is desirably effected by a tool which engages each tooth only at a central area narrower than the base of the tooth, and the travel of the bending tool is desirably terminated at a position above the points of the teeth. Each tooth is thus formed with a central area extending toward, but terminating short of, the point of the tooth, in which area the tooth body is cold worked longitudinally of the tooth. The cold worked area forms a shal-

2

low depression on the outer face of the tooth, which is flanked on either side by a higher standing un-worked area. The central depression terminates short of the point of the tooth and is defined at its lower end by a low ridge or barb at the end of the tool travel and a short distance above the point of the tooth. The bending and cold working operation, which bends the main body of the tooth to a position substantially perpendicular to the plank of the strap, tends to leave the point of each tooth angled outward from the perpendicular position of the main body of the tooth. The outward inclination of the points is desirably emphasized by mechanically offsetting the points of the teeth outward during the bending and cold working operation. When these operations are performed on stamped teeth with the sharp edge corners disposed at the outer face of the teeth, the rounded edge produced by the stamping lies at the inner face of the teeth and tends to produce a wedge-shaped configuration of the tooth points.

Each end portion of the plank protector strap is provided with means to secure that end portion to the side of the plank, and such means is preferably in the form of an aperture adapted to pass a common nail. The aperture of at least one of the end portions is desirably elongated, to permit the ends of a pair of straps to be applied in overlapping relation and with the nail holding the outer strap passed through the elongated aperture of the underlying strap end.

The plank protector may be made in different lengths to fit planks of different nominal widths, but since the protector is conformed to the plank during its application, an exact fitting relation need not be provided, and the plank protectors will compensate for usual variations in the dimensions of the nominally-sized planks for which they are intended.

The plank protector has a main body adapted to lie transversely of a plank against a face thereof, with teeth spaced along the opposite edges of such main body to penetrate the plank face transversely of its wood grain and to secure the body to the face, with the opposite teeth formed to interlock with end grain and to spread as they penetrate the wood. At each end of the body an end portion of the plank protector extends outward to project beyond the edge of the plank face and to be bent over that edge against the side of the plank and secured to the side. In the preferred method of applying the plank protector, one end portion is first secured to one side of the plank, the main body of the protector is then bent over against a face of the plank, and its teeth driven into that face, progressively across the plank, and the opposite end portion is then bent over the opposite side of the plank and secured to that side.

The accompanying drawings illustrate the invention. In such drawings:

Fig. 1 is an isometric view of a plank protector embodying the invention;

Fig. 2 is a partial side elevation showing a preferred tooth form;

Fig. 3 is a section taken on the line 3—3 of Fig. 2; Fig. 4 is a section showing a plank protector embodying the invention applied to a plank surface;

Fig. 5 is an isometric view showing a preferred arrangement of a pair of plank protectors applied to a plank end;

Fig. 6 is an isometric view showing a single plank protector applied to the end face of a plank;

Fig. 7 is a partial section showing a pair of plank protectors applied to a plank with their end portions in overlapping relation; and

Fig. 8 is a side elevation of a plank end further illustrating the arrangement shown in Fig. 7.

The plank protector shown in the drawing comprises

an elongated strap having a main body portion 10 with a series of spaced teeth 12 along each of its edges. The end portions 14 of the strap project outward from the ends of the body portion 10 and carry no teeth. Each end portion is provided with a central aperture 16, desirably of elongated shape, and the body portion 10 desirably has a central aperture 17.

The protector shown in Fig. 1 is desirably formed by stamping from sheet metal. A blank is first stamped, with the teeth projecting as lateral extensions from and coplanar with the main body of the strap. The stamping operation is desirably carried out with the punch engaging the top surface of the blank and with the die engaging the bottom surface of the surrounding sheet metal, so that the sharp edge produced by the stamping operation occurs at the top surface of the tooth projections. The teeth are then bent downward from that top surface so that their sharp edges lie at their outer faces. The tooth bending desirably occurs on bend lines extending longitudinally of the body 10, and the teeth along each edge of the body 10 are preferably bent downward about a common bend line substantially coincident with the side edge of the body 10, so that all the teeth along each edge lie substantially in a common plane generally perpendicular to the plane of the body 10.

The teeth are desirably spaced, and are desirably wedge-shaped in plan. In the preferred tooth form, as shown in Figs. 2 and 3, the bending tool engages each tooth over only a central area narrower than the base of the tooth, and during its operation it cold works that central area 18 with a planing or ironing action. This slightly depresses the area 18 below the adjacent surfaces of the tooth, and stiffens and reinforces the tooth. The movement of the tool is stopped before its lower edge reaches the point 20 of the tooth, to leave a ridge or barb 21 spaced slightly above the point 20 and at the bottom edge of the cold worked area 18. In addition, as the bending operation nears completion, the end of the tooth, below the ridge 21, is desirably brought against a suitable support, which engages the inner face of the tooth and forms a shallow depression or notch 22 thereon above the point 20 and below the ridge 21. The combined effect of the bending and cold working and notching causes the point 20 of the tooth to be angled and offset outward. The preferred tooth form thus comprises a central cold worked portion 18, flanged by triangular areas which are not cold worked and which are slightly deformed from the plane of the cold worked area, and with a tooth point portion in the form of an outwardly bent and offset prong. When the original stamping operation is carried out in the preferred manner, as noted above, the sharp edges produced by the stamping will occur at the outer face portion of each tooth, and the rounded edges will occur at the inner face of each tooth. The rounding will be accentuated at the point of the tooth, and the prong portion of the tooth will thus be of wedge-shaped cross section.

When a plank protector having the preferred tooth shape is driven into the face of a plank, the outwardly inclined prongs will cause the teeth to spread as they progress into the body of the plank, and when the teeth are finally driven home, they will have an outward inclination generally as shown in Fig. 4. As the teeth enter the wood, their outer sharp edges will cut the fibers of the wood, and the cut ends of the fibers will be bent downward and tightly pressed against the broad faces of the teeth, firmly engaging the tooth surfaces and especially the ridges 21 to lock the teeth in place. The teeth at opposite sides of the body 10 will cooperate with each other and securely lock the body 10 against the face of the plank. Where desired, the mid-portion of the body 10 can be additionally secured to the plank by driving a nail into the plank through the central aperture 17 in the body 10.

When the plank protectors are used to reinforce the end

of a plank, they are desirably used in pairs, and are preferably applied in the arrangement shown in Fig. 5, with the two protectors of the pair slightly offset longitudinally of the plank from each other. The protectors are desirably distributed and sold with their end portions 14 projecting straight outward from the ends of the body 10. In the preferred method of application, one end portion 14 is first secured to one edge 30 of a plank, as by a nail 31. The main body 10 is then bent toward and against the face 32 of the plank and its teeth driven into the plank, as with a hammer. When the body 10 is firmly in place against the plank face 32, the opposite end portion 14 is bent downward against the opposite side 34 of the plank and secured with a fastener such as a nail. A second plank protector is desirably secured against the opposite face of the plank in a slightly offset position, as indicated in Fig. 5.

The plank protector may also be used in a manner shown in Fig. 6, where the plank protector is applied to the end face 40 of a plank 42.

The apertures 16 in the end portions of the plank protector are desirably elongated as is shown in Fig. 1, to permit the plank protector to be applied in the arrangement shown in Figs. 7 and 8. In this arrangement, a plank protector A is first applied to the top surface of the plank, and its end portion 14 bent and secured to the edge of the plank, by a nail 44 passed through the slot 16 at the remote end of that slot. The second plank protector B of the pair is then applied to the bottom surface of the plank, and its end portion 14 is bent over the side of the plank in a position to overlie the nail 44 and the end portion 14 of the protector A. Its end portion 14 is then secured by a nail 46 passed through the aligned slots of the end portions 14, at the remote end of the slot of the outermost end portion 14.

The plank protector may serve as a permanent label to identify ownership of the plank to which it is applied, as by marking the plank protector with a suitable marking such as the initials shown in Fig. 5.

I claim as my invention:

1. A plank protector, comprising an elongated metal strap having a main body adapted to lie transversely of a plank against a face thereof, end portions projecting from the ends of said body and adapted to be bent over the edges of the plank to lie against the sides thereof, said end portions having means for securing the same to the plank sides, a series of spaced teeth along each edge of the strap body portion to penetrate the plank face and secure the strap thereto over substantially the whole width of the plank, said teeth being generally triangular in plan and each bent downward from the body of the strap about a generally longitudinal bend line and normally positioned substantially perpendicular to the plane of the strap, the downwardly presented points of the teeth being offset outward from the plane of the teeth and angled outward to cause the teeth and the points thereon to spread outwardly at different angles when driven into a plank face, a cold worked central area on each tooth forming a recess extending from the base of the tooth toward the point thereof and terminating short of such point to form a ridge at the outer face of the tooth adjacent the point, and a notch extending transversely across the inner face of the tooth adjacent the point, said ridge and notch offsetting the point out of the plane of the tooth.

2. A plank protector, comprising an elongated metal strap having a main body adapted to lie transversely of a plank against a face thereof, a series of generally triangular shaped teeth spaced along and substantially parallel with each edge of the body, each of said teeth having on its outer surface a central recessed area extending from the base of the tooth toward the point thereof and defined at its sides by a pair of higher-standing shoulders extending longitudinally from the base of the tooth to the edge of the tooth intermediate

the length thereof, said central recess being defined at its lower end by a transverse shoulder standing above the recessed area, and said recess having unshouldered lower side edge portions at which its floor joins the edges of the teeth, the point portions of the teeth below the transverse shoulders being offset and angled outward from the main bodies of the teeth, whereby upon driving of the teeth into a plank, the outwardly angled points force the recessed bodies of the teeth outward to interlock the recess and its shoulders with cut ends of the wood fibers, and said strap having end portions projecting from the ends of its body and adapted to be bent over the edges of the plank to lie against the sides thereof, said end portions having means for securing the same to the plank sides.

5

10

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