

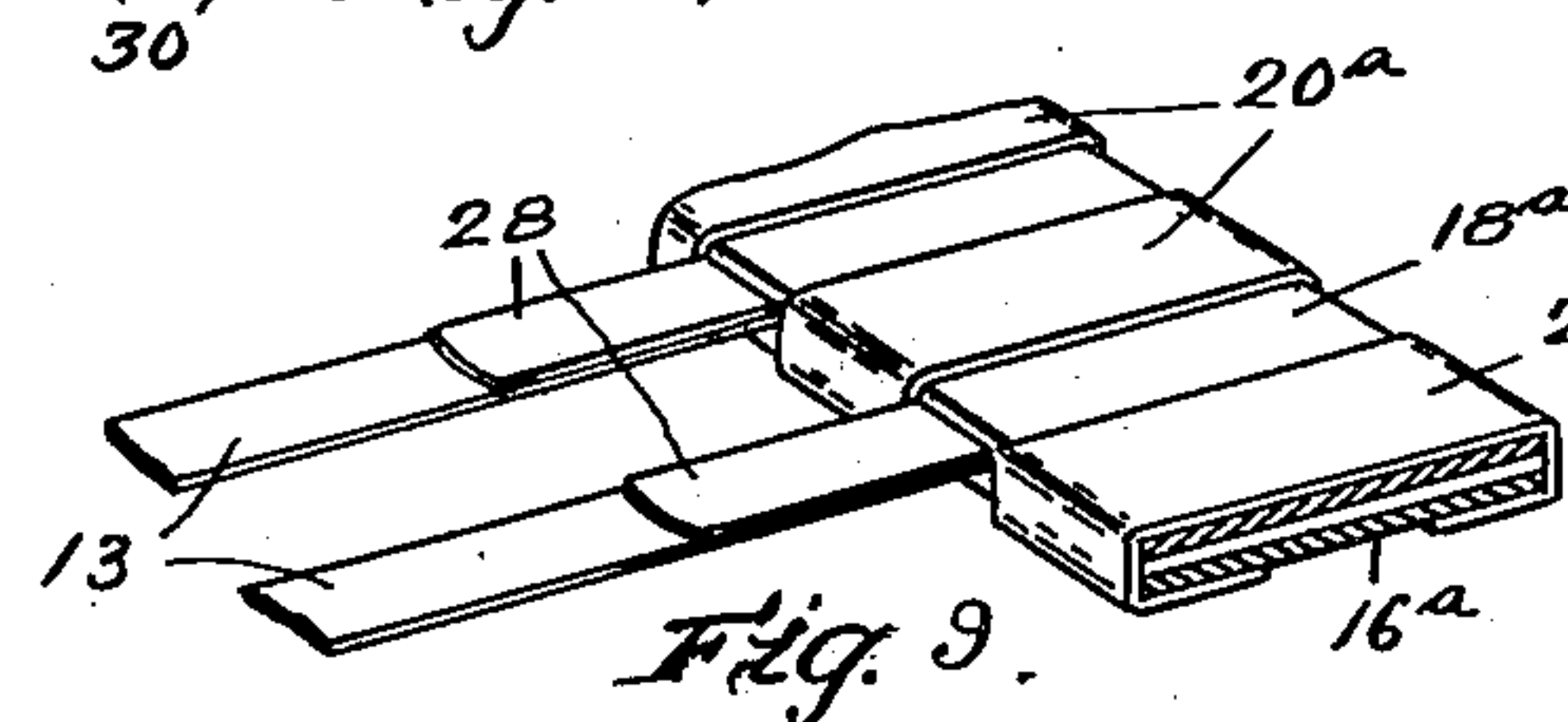
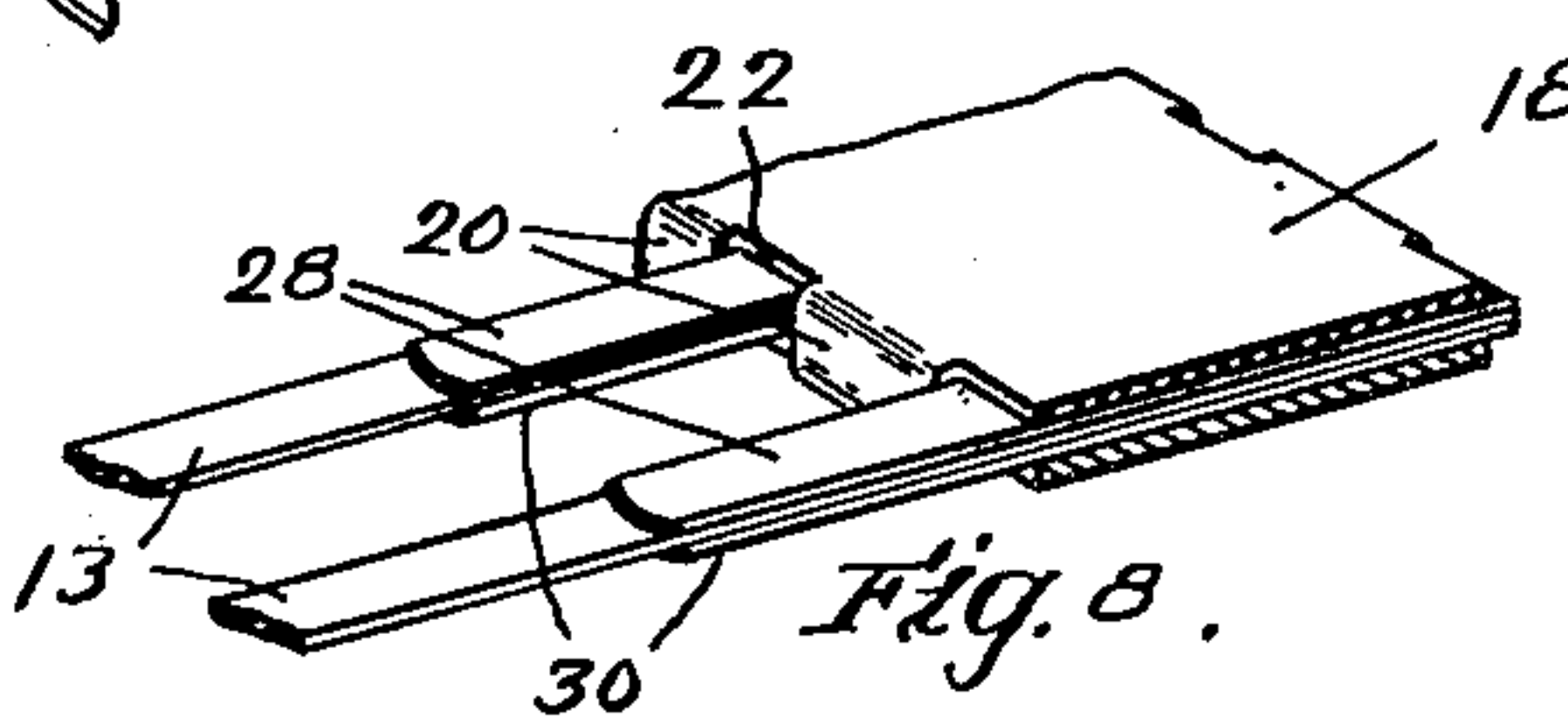
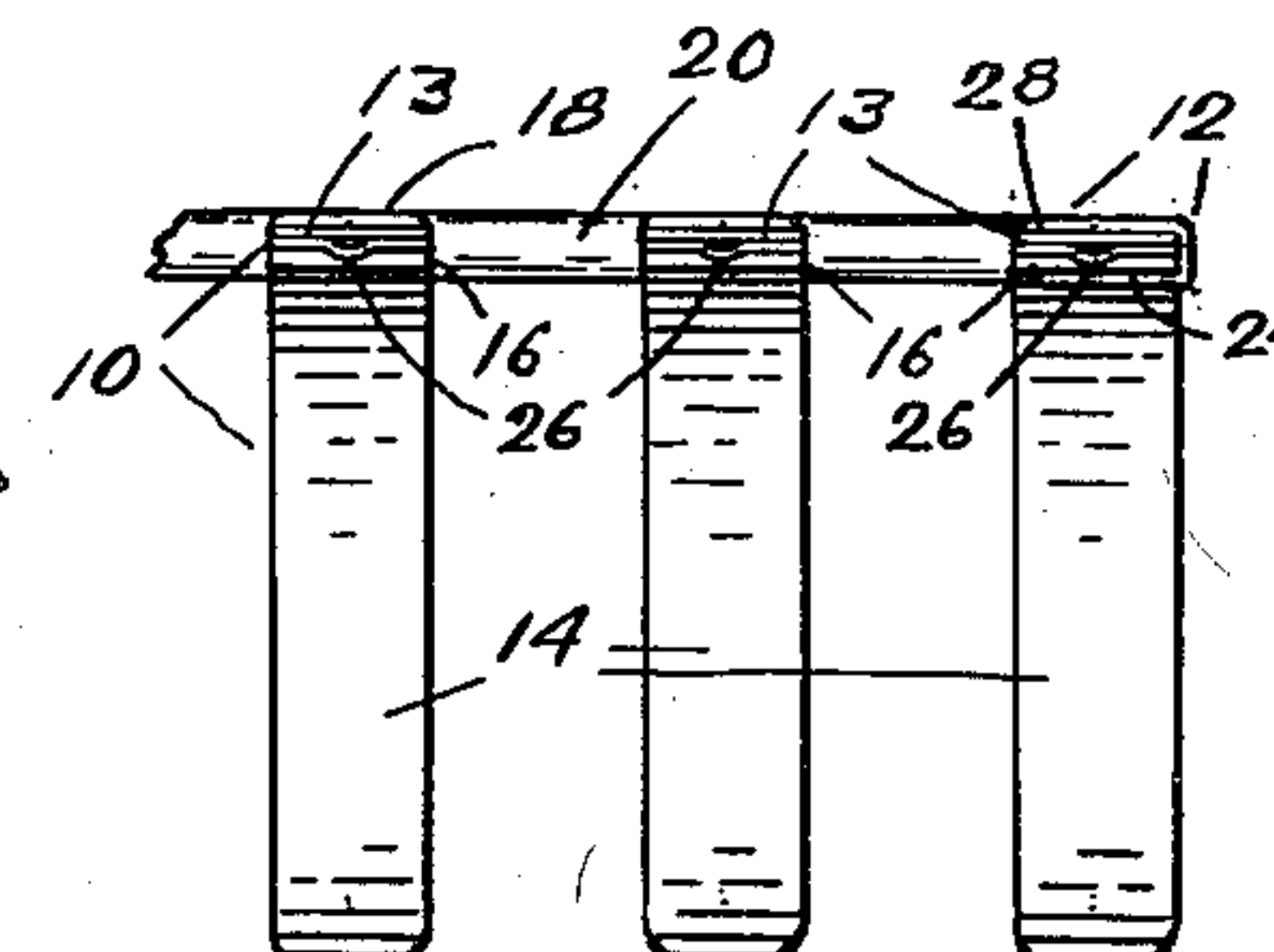
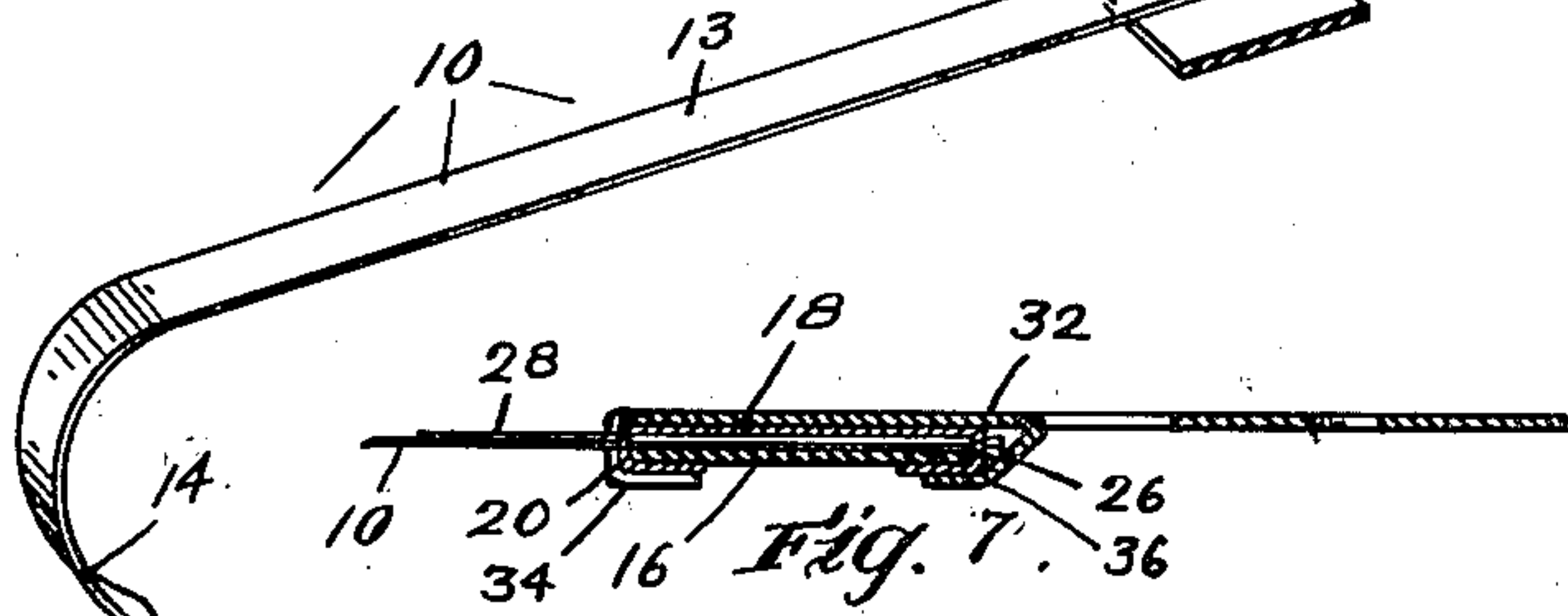
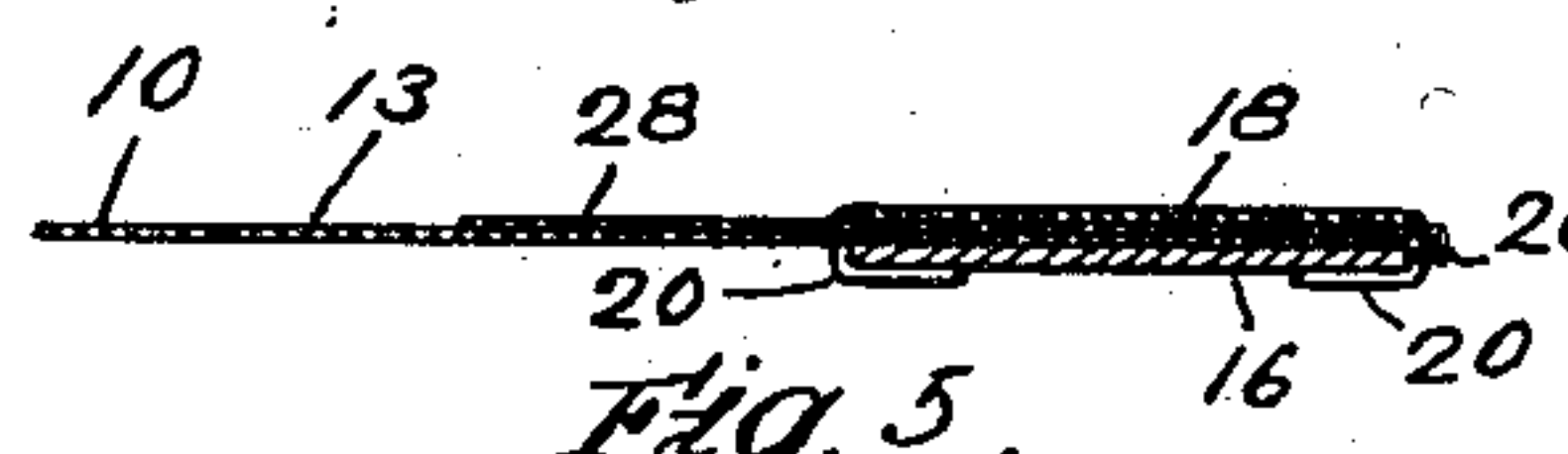
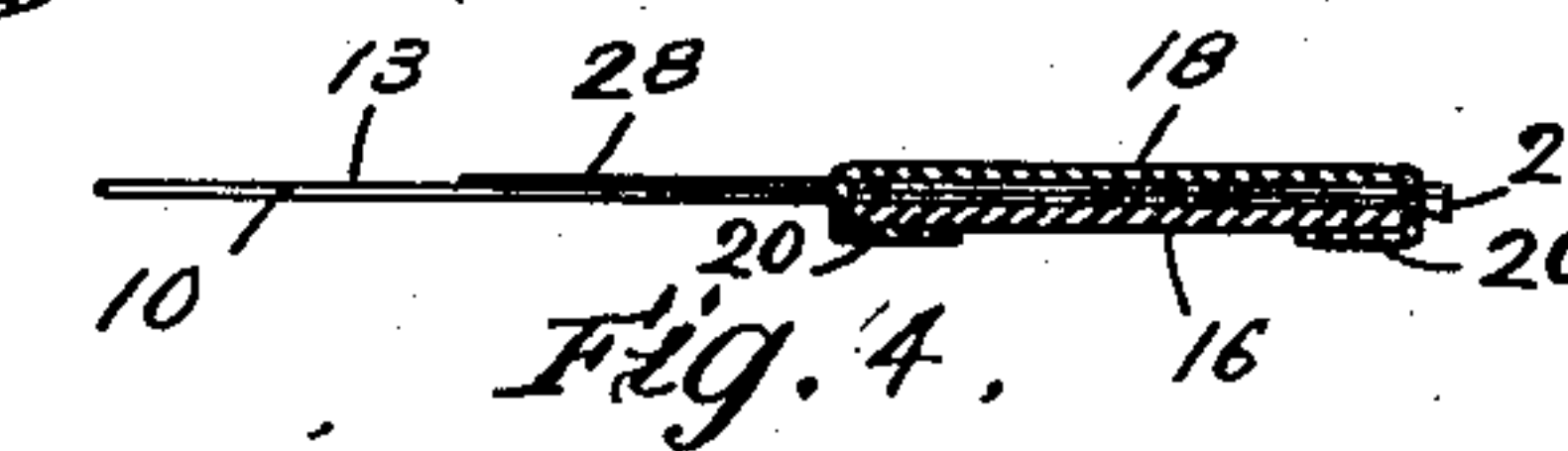
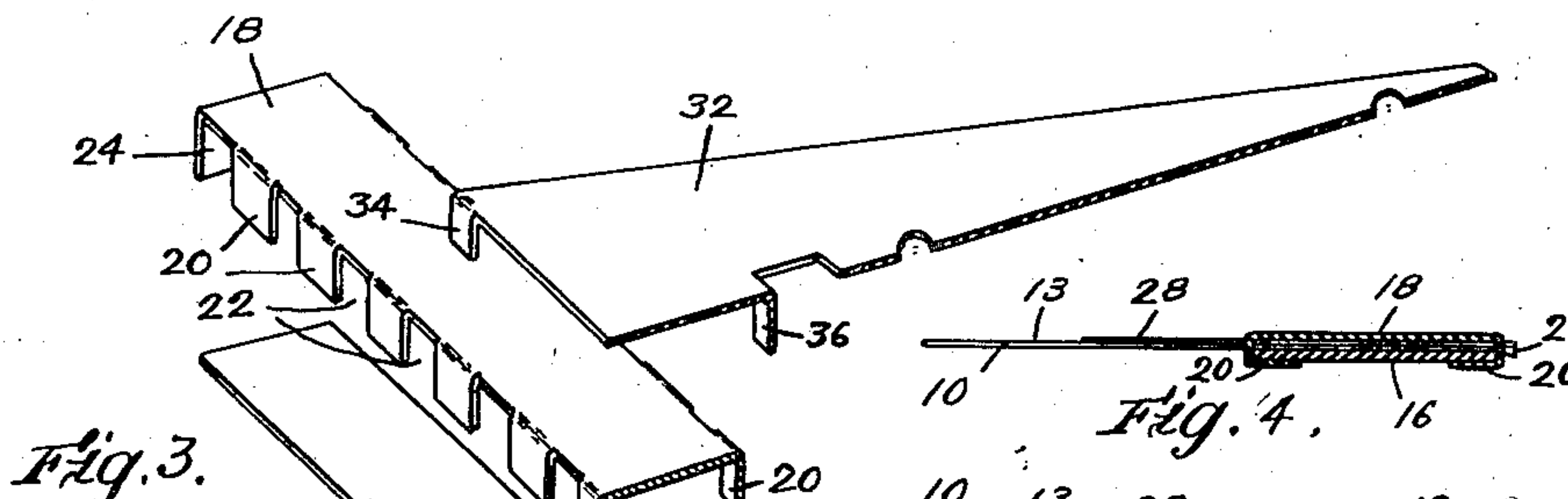
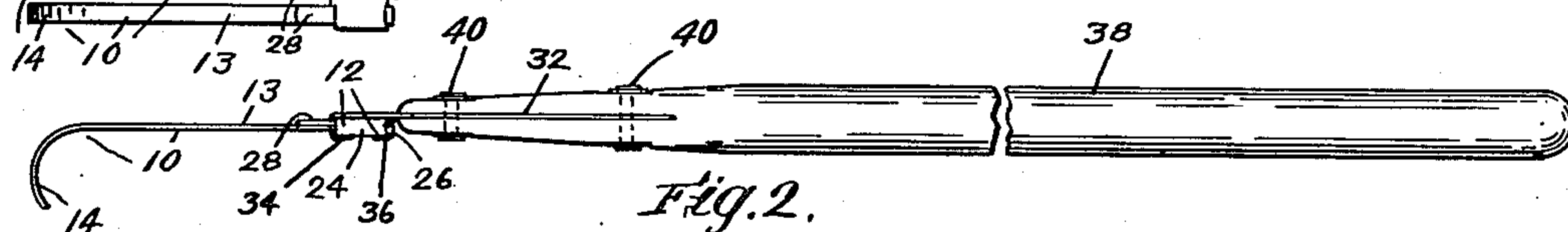
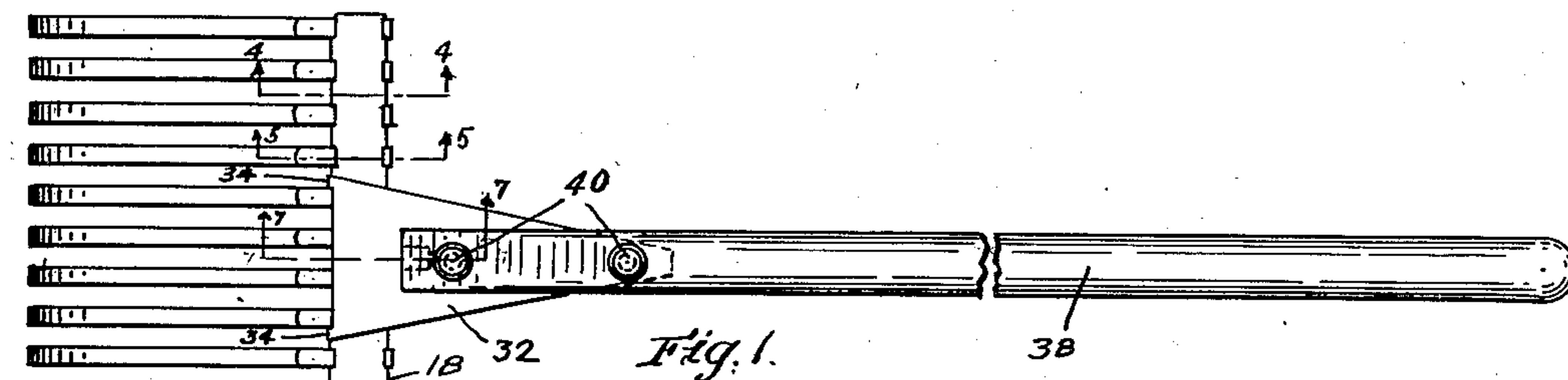
Dec. 29, 1936.

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2,066,036

METAL RAKE

Filed Feb. 2, 1935



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## UNITED STATES PATENT OFFICE

2,066,036

## METAL RAKE

Chester Greenwood, Farmington, Maine

Application February 2, 1935, Serial No. 4,676

9 Claims. (Cl. 55—114)

This invention relates to rakes having resilient metal teeth and has for its objects to improve and simplify the construction of the rake; to provide a construction wherein an individual tooth, if broken or otherwise damaged, can be removed and replaced by a new tooth; to provide resilient reinforcement for the shank portion of the teeth; and to provide a construction wherein the means that clamps the teeth in position also constitutes the spacing means for the teeth.

Fig. 1 is a plan view of a rake embodying the present invention.

Fig. 2 is a side elevation of the rake of Fig. 1.

Fig. 3 is an exploded sectional view of the rake of Fig. 1.

Fig. 4 is a sectional detail taken along line 4—4 of Fig. 1.

Fig. 5 is a sectional detail taken along line 5—5 of Fig. 1.

Fig. 6 is a rear view of the rake of Fig. 1.

Fig. 7 is a sectional detail taken along line 7—7 of Fig. 1.

Fig. 8 is a perspective detail illustrating a double reinforcement for the shank portion of the teeth.

Fig. 9 is a perspective detail illustrating a modified arrangement for clamping and spacing the teeth.

The rake embodying the present invention comprises a plurality of resilient metal teeth 10 secured at their shank portions to a back plate structure 12. The teeth 10 are or can be identical and each comprises a thin flat strip composed preferably of tempered steel that has a straight shank 13 and an approximately semi-circularly curved outer end 14. The back structure 12 comprises a transverse bottom plate 16 and a transverse upper plate 18 between which the teeth are clamped. Both plates are composed of metal and the bottom plate 16 preferably is somewhat thicker than the upper plate 18. The upper plate 18 at its lateral edges is provided with a series of ears 20 having a width substantially equal to the spacing between the individual teeth, there being recesses 22 between the consecutive ears and the recesses having a width substantially equal to the width of the teeth. The plates 16 and 18 are positioned in superposed relation with the shanks of the teeth interposed therebetween and located in the recesses 22 and the ears 20 are reflexed over against the bottom face of the bottom plate 16, as is best shown in Figs. 4 and 5, and thereby clamp the teeth securely between the plates. The upper plate 18 is provided with an

ear 24 at each end thereof, which ears are reflexed over and against the lower face of the bottom plate 18 to secure the end teeth in position and the plates against relative endwise displacement. The shank portions of the teeth project somewhat beyond the rear edges of the plates 16 and 18 and are provided with projections 26, see especially Figs. 3 and 6, that prevent the teeth from being drawn from between the plates if a tooth catches upon an obstruction.

Preferably the shank portions of the teeth are provided with resilient reinforcements so as to strengthen the teeth in the vicinity of their engagement with the plates 16 and 18 and thereby prevent harmful bending of the teeth. The reinforcing means comprises resilient strips 28 preferably although not necessarily formed of the material composing the teeth and having the same width and thickness as a tooth. The reinforcing strips are superimposed upon the teeth and are clamped thereagainst between the plates 16 and 18 and project forwardly of said plates, as illustrated in Figs. 1, 4 and 5, for a sufficient distance to suitably reinforce the teeth. For some purposes it may be desirable to arrange similar reinforcing strips 30 on the under sides of the teeth, as illustrated in Fig. 8.

If a tooth 10 should happen to break it can be removed from between the plates 16 and 18 by spreading the ears 20 of the upper plate on opposite sides of the tooth away from the bottom plate sufficiently to relieve the clamping pressure on the tooth to permit the tooth to be withdrawn from between the plates and a new tooth inserted, whereupon the ears can be struck down against the bottom plate again to clamp the new tooth in position.

The back structure 12 is secured to a handle plate 32 which preferably is generally triangular in configuration and has a pair of ears 34 at its front edge and a single ear 36 down struck from the middle portion of the plate. The front ears 34 are positioned in interdental spaces on opposite sides of the median line of the rake and the ears are reflexed over and against reflexed ears 20 of the plate 18, whereby to clamp the handle plate securely to the rake structure. The handle 38 has a slotted end in which the plate 32 is received and retained by suitable means as rivets 40.

As a modified construction the back structure 12 can comprise a lower plate 16a similar to the plate 16 and an upper plate 18a which is as wide as the lower plate but does not have the ears 20. This construction is illustrated in Fig. 9.



The plates are clamped together with the teeth between them by clamping and tooth spacing members or clips 20a which comprise metal strips that are positioned between the teeth and have their ends reflexed over and against the lower face of the plate 16a.

I claim:

1. A metal rake having a back structure and resilient metal teeth having straight shanks carried by and extended forwardly of said structure, said metal teeth being each separate from the others so that a single broken tooth can be removed singly from said back structure and replaced by an unbroken tooth, said structure comprising flat upper and lower plates positioned in superposed relation and between which the straight shanks of said separate teeth are clamped, one of said plates at each of its opposite long sides having a series of ears spaced longitudinally of the plate, the spaces between the ears being substantially equal to the width of the teeth and the width of the ears being substantially equal to the spacing between the teeth, the ears being located between the teeth and reflexed over and upon the face of the other plate, said eared plate also having ears at the opposite ends thereof which are reflexed over the ends of and upon the face of the other plate.

2. A metal rake having a back structure and resilient metal teeth carried by and extended forwardly of said structure, said structure comprising upper and lower plates disposed in superposed relation and between which said teeth are clamped, one of said plates at each of its opposite long sides having a series of ears spaced longitudinally of the plate, the spaces between the ears being substantially equal to the width of the teeth and the width of the ears being substantially equal to the spacing between the teeth, the ears being located between the teeth and reflexed over and upon the face of the other plate, said teeth being extended rearwardly beyond said back structure and having projections which engage said back structure and prevent the teeth from pulling out.

3. A metal rake having a back structure and separate resilient metal teeth having straight shanks carried by and extended forwardly of said structure, said structure comprising flat upper and lower plates disposed in superposed relation and between which the straight shanks of said teeth are clamped, one of said plates at each of its opposite long sides having a series of ears spaced longitudinally of the plate, the spaces between the ears being substantially equal to the width of the teeth and the width of the ears being substantially equal to the spacing between the teeth, the ears being located between the teeth and reflexed over and upon the face of the other plate, and separate resilient reinforcing strips upon the shank portions of said teeth forwardly of said back structure and clamped between said plates, said reinforcing strips being approximately as wide as said teeth and lying between said ears of both series and being held thereby against lateral displacement.

4. A metal rake having a back structure and resilient metal teeth carried by and extended forwardly of said structure, said structure comprising upper and lower plates positioned in superposed relation and between which said teeth are clamped, one of said plates at its opposite long sides having a series of ears spaced longitudinal-

ly of the plate, the spaces between the ears being substantially equal to the width of the teeth and the width of the ears being substantially equal to the spacing between the teeth, the ears being located between the teeth and reflexed over and upon the face of the other plate, and resilient reinforcing strips upon the shank portions of said teeth on opposite faces of the teeth forwardly of said back structure and clamped between said plates.

5. A metal rake comprising a tooth-supporting structure including a pair of transverse plates positioned in superposed relation, resilient flat metal teeth having their shanks located between said plates, and tooth-spacing and clamping means located between said teeth and engaged with both plates and serving to clamp them upon said teeth, said clamping means comprising separate clips a separate one of which is disposed between each two adjacent teeth, said clips traversing one of said plates and having its ends reflexed against the face of the other plate.

6. A metal rake comprising a tooth-supporting structure including a pair of transverse plates positioned in superposed relation, resilient flat metal teeth having their shanks located between said plates, and tooth-spacing and clamping means located between said teeth and engaged with both plates and serving to clamp them upon said teeth, said clamping means comprising ears integral with one of said plates and reflexed upon the other plate, the shank ends of said teeth being extended rearwardly of said tooth supporting structure and the extended ends having projections which abut against said structure and constitute means preventing the detachment of the teeth.

7. A metal rake comprising a tooth-supporting structure including a pair of transverse plates positioned in superposed relation, resilient flat metal teeth having their shanks located between said plates, and tooth-spacing and clamping means located between said teeth and engaged with both plates and serving to clamp them upon said teeth, and a handle plate bearing upon one of said transverse plates and extended rearwardly thereof and having ears which clamp said transverse and handle plates together.

8. A metal rake comprising a tooth-supporting structure including a pair of transverse plates positioned in superposed relation, resilient flat metal teeth having their shanks located between said plates, tooth-spacing and clamping means located between said teeth and engaged with both plates and serving to clamp them upon said teeth, and a handle plate bearing upon one of said transverse plates and extended rearwardly thereof and having ears which clamp said transverse and handle plates together, certain of said plate-ears being located between certain teeth.

9. A metal rake comprising a tooth-supporting structure including a pair of transverse plates positioned in superposed relation, resilient flat metal teeth having their shanks located between said plates, tooth-spacing and clamping means located between said teeth and engaged with both plates and serving to clamp them upon said teeth, and a handle plate bearing upon one of said transverse plates and having ears which are located between certain of said teeth and are clamped upon the clamping means therebetween.

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