COMBINED SPLINT AND TRACTION DEVICE
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ABSTRACT OF THE DISCLOSURE
An improved splint and leg traction means with a ratchet arrangement for applying and maintaining traction on a fractured leg including a member for retaining the foot in a supported position and novel transverse splint straps.

BACKGROUND OF INVENTION
Fractures of the extremities require appropriate splinting. It is epitomized in the aphorism “Splint ‘em where they lie.” It is generally recognized that splints should be applied at the scene of injury before the patient is moved.

For thigh and leg fractures the application of a slow, steady pull to relax the muscles and not produce irritation is recommended therapy. A gentle and steady pull should be in the long axis of the extremity. This brings the fragment which can be controlled into alignment with the fragment which cannot. Chance for injury to soft tissue, and blood vessels are reduced and relief from pain is accomplished in this manner. A small fracture might otherwise mean a large disability.

Prior first aid art includes the Thomas ring splint. Tongue depressors for a Spanish windlass action to increase and maintain traction is advised. The use of a foot support, “if available” is suggested. Thereafter the patient should be transported with extreme care and gentleness. See “The Management of Fractures and Soft Tissue Injuries,” 2nd edition, American College of Surgeons, p. 78.

Upon hospitalization, the prior art leaves something to be desired. Skeletal traction has the advantage that it is more efficient than adhesives and glue applied to the skin; more weight can be used and is more comfortable, if applied correctly. But according to Management of Fractures, etc., Conwell and Reynolds, 7th edition, p. 100, “In many clinics skeletal traction has become a lost art.” Also, “even under the best of conditions, the bone will become infected from the pin wound.”

SUMMARY
My device has a heel support tape as a part of the sling and traction combination. This, coupled with a U-shaped member under the heel permits easy and safe handling of patients. A ratchet arrangement is adapted to sensitive control of the amount of force applied to the leg. Even though the force is critical and should be varied, the continuous use of my device is acceptable at all stages of therapy.

DESCRIPTION OF THE PREFERRED EMBODIMENT
In the drawing:
FIGURE 1 is a perspective view of the device, complete except the foot tape support.
FIGURE 2 is a perspective view of the foot tape support with the heel portion.
FIGURE 3 is a perspective view of the device showing it in use.
FIGURE 4 is a perspective view of a modification of my device suitable for adapting to the existing Thomas splint.
FIGURE 5 is a close-up perspective of the foot end of the device with arrows to illustrate the direction of force.
FIGURE 6 is a brake detail part of the ratchet assembly, and
FIGURE 7 is a detail of an adjustable portion of the parallel splint rods.

In the drawing, wherein like numerals represent like parts throughout, the numeral 1 is one of two identical parallel rod members characteristic of the well known Thomas splint. The rods telescope into tubular sections 2 to accommodate patients with legs of various lengths.

As shown in FIGURE 7, a locking arrangement may be formed of pin 39 on spring-steel arm 9. It fits into a plurality of recesses 37 through orifice 38 of item 2.

Elements transverse to the parallel members include the half ring cradle 6 for patients’ leg 36. It is swivels mounted at the ends of 2 for movement in the direction of the arrow by dual universal joints 5. Also traversing the space between the legs are a plurality of support brackets 25 in number, at regular intervals, free to slide in the direction of arrows 14 of FIGURE 1. With each support are elastic bands 8 and 10 two sections which lock over the leg in a bandage fashion. For this I prefer to use modern cohesive materials which grip without tearing, buckling or snapping. Completing the transverse elements is non-elastic strap 4 with a buckle and wire brackets 7. It may slide along tubular frame 2.

At the foot end of the device I have provided novel U-shaped support member 12 secured to rods 1 by brackets 24 on each side. This obviates the necessity of a separate foot mount and keeps the foot from bumping a hard surface.

Much of my invention resides in a ratchet pulling means or system 13. It comprises a spool 28 with spacers 26 which revolves in the direction of arrows of FIGURE 5 by manual operation of handle 11. This pulls the foot and leg of a patient in the direction of the arrows of FIGURE 3. When desired tension is acquired spring steel brake 25 engages teeth 35 of cog 27, see FIGURE 6. Finger pressure at the place indicated by arrow 33 moves item 25 in direction of arrow 34 releasing the ratchet for a new position. A spring metal handle retainer 30 may lock onto handle 11 and swing out of the way when the handle is operated. Nylon belt 29 with metal strip 31 wraps onto spool 28 as illustrated.

Snap fasteners 32 connect the described ratchet system to tape support 15. It is preferably made of non-elastic nylon material. At each end thereof are two rings 16 for engagement with fastener 32. A tape heel portion 17 is integral therewith by T-shaped connection at one end and a plurality of chain-linked rings 18 at the opposite end. FIGURE 2 shows the support in an open position and FIGURE 3 shows the support in position for use.

Lastly, a modification of the existing Thomas splint 19 is within the scope of my Invention. This is shown in FIGURE 4. The Thomas splint is made for either leg by simply turning it over. In such instances I have a rectangular support member 21 for use on either leg. My modification 19 is an adapter for splint 19. It has cross bar 22 to align with and abut splint cross piece 23 and it is secured thereto by a plurality of clamps 20, as illustrated. With the modification, conventional Thomas splints may be converted into my novel combination.

1. In a leg splint and traction device, a splint having at least two aligned and spaced elongated members that are connected at each end with spaced cross members, one of said cross members being shaped to abut against the bone of the user, a pulling strap for being attached to the foot of the user including a first tape member that is adapted to be looped around the ankle of the user and crossed over the upper portion of the foot with the ends ex-
tending laterally on each side of the mid portion of the foot,
a second tape member connected at one end to said first
tape member at a point intermediate the ends of said
first tape member so as to lie in the back of the ankle
of the user, which second tape member is adapted to
extend down the back of the heel of the user with its
other end extending away from the foot adjacent the
free ends of said first tape member, and
means connected to the ends of said first and said
second tape members and to the other cross member
of said splint for exerting a pulling force on said pulling
strap that exerts a tension force on the leg of a
user positioned in said splint, which tension force is
exerted through said first and second tape members
to not substantially bend the forward portion of the
foot downwardly.

2. In a leg splint and traction device as claimed in claim
1 in which,
said second strap has means for varying the length there-
of between its connection with said first tape mem-
ber and said connector means, whereby the connec-
tion to said connector means is at the center line of
the leg and the pulling force exerted on said pulling
strap is on the center line of the leg of the user.

3. In a leg splint and traction device as claimed in claim
2 in which,
said length varying means of said second strap com-
prises a plurality of rings connected in a string, in
which selective ones of said rings are connected to
said connector means.

4. In a leg splint and traction device as claimed in claim
2 in which,
said connection means comprises a ratchet means con-
ected at said other end connection of said splint
for exerting said tension force.

5. In a leg splint and traction device,
a splint having at least two aligned and spaced elon-
gated members that are connected at each end with
spaced cross members and with one cross member
shaped to abut against the body of the user,
a spool that has an axle with a belt for being wound on
said spool,
a pair of spaced aligned longitudinal members with ad-
acent ends secured to opposite sides of said spool axle
allowing rotation of said spool thereon,
said longitudinal members extending radially away from
said spool, said longitudinal members having a con-
necting member extending therebetween spaced from
said adjacent spool ends,
means releasably securing said longitudinal members to
said two aligned elongated members with said con-
necting member abutting against the other cross mem-
ber,
means for rotating said spool on said longitudinal mem-
bers and exerting tension through said belt on the
limb of a user that is adapted to be positioned in
said splint, when the user's limb is connected to the
end of said belt, and
locking means for locking said splint in given rotational
positions.

6. In a leg splint and traction device as claimed in claim
5 including,
a rectangular shaped member secured at substantially
the mid points of a pair of its adjacent sides to the
ends of said longitudinal members at the connection
to said splint axle.

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