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POUP TRAFFIC SENTINEL
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8 Claims

ABSTRACT OF THE DISCLOSURE
Traffic cones are provided with flexible walled ring corruga-
tions so that the cones will collapse or extend when the air pressure inside thereof is either negative or posi-
tive, respectively. Each of such cones is provided with a receptacle within which it can collapse, and several of such receptacles are located below and flush with the sur-
face of a roadway, and are connected at spaced apart loca-
tions to a common air conduit having reversibly con-
ected thereto an air pump.

Background of the invention
In the prior art there are many devices for the con-

tral of traffic embodying the moving of continuous bur-
rier strips between depressed and elevated positions

respect to a highway surface, and the moving of in-
dividual markers between such positions. However, such
devices have been actuated by various types of jacks and
controls therefor that constitute expensive and compli-
cated mechanisms. Further, such prior art systems
have been easily damaged by garish thereon being contacted
by highway vehicles and by severe weather conditions.
Thus it is an object of the present invention to con-

struct a marker as well as a system for actuating a

ularity of such markers to move them between de-
pressed and elevated positions with respect to a high-

way surface, that are simple in construction and operation,

that are relatively inexpensive to install and maintain, and

that are not easily damaged by weather conditions or by

contact with vehicular traffic.

Summary of the invention
The above mentioned defects of the prior art traffic
control devices are remedied and the above objects
achieved by: First, constructing a traffic control cone,
or marker, so that the sides of the cone are corrugated
annularly so, in effect, shape the cone as a bellows that
is thin walled and flexible enough that reducing the pres-

sure inside thereof slightly below atmospheric will cause
the cone to collapse downward and to extend upward
when the interior pressure is slightly above atmospheric.
Second, by sinking a cup in the pavement of a highway
with the rim of the cup flush with the surface of such
pavement and securing the bottom edge of the cone in-
side of the cup adjacent the rim thereof. Third, so setting
a plurality of such cups and cones in a pavement in de-
sired locations and connecting them to an air conduit
having in communication therewith an air pump that
upon proper operation will provide the desired air pres-
sure in each of the cones of the plurality connected there-

o. And, fourth, the provision of a valve structure at the
upper end of each cone so that if a cone is struck by a
vehicle or other object, the air in such struck cone will
easily and rapidly escape therefrom to reduce the pos-
sibility of damage thereto.

Brief description of the drawings
An embodiment of the invention as outlined above is
hereinafter described with more details important to the
invention and is illustrated in the accompanying draw-

ings, in which:

FIGURE 1 is a schematic isometric showing of por-
tions of a traffic control system embodying the features
of the present invention.
FIGURE 2 is a diametrical sectional elevational view
of one of the individual pop-up cones and its receptacle
as shown in FIGURE 1, but enlarged therefrom, and
with the cone expanded.
FIGURE 3 is similar to FIGURE 2 but with the cone
retracted into its base cup.
FIGURE 4 is an isometric view of the spring in the
cone’s upper end valve.

Description of the preferred embodiment
One of the pop-up units will be described in detail
before describing the relating features of a plurality of
such units as illustrated in the schematic perspective of
FIGURE 1.
FIGURES 2 and 3 are diametrical sectional elevational
views of a unit 11 with the views differing in that FIG-

URE 2 shows the cone 12 of the unit in its extended
position and FIGURE 3 shows the cone 12 in its re-
tracted position. Each of the cones is tapered from bot-
tom to top end and is formed between its ends by a con-

tinuous series of annular corrugations, or rings 13, with

each ring being smaller in diameter than the one below
to give the cone a bellows like construction. The purpose
of tapering the cone is to increase its rigidity when ex-
tended and facilitate its retraction, or collapse and the
smaller rings to pass thru the larger rings to the position
of the cone in FIGURE 3. Further, the bellows construc-
tion resists the tendency of the sides to move radially in-
ward when the air pressure is reduced inside of the cone.
The cone adjacent its upper end has two opposite sides
thereof squeezed together by a flat spring clamp 14 so
that there is between the legs of the clamp and the inner
sides of the cone a slit 16. FIGURE 4 is a perspective
illustration of the clamp in its open and relaxed condi-
tion. It is made of a thin strip of spring steel bent medially
thereof so that the halves are in opposition is curved
outwardly from each other. This outward curve of the
legs gives relatively uniform loading along the legs when
they are brought together. One of the ends is formed with
an inwardly turned hook 17 inside of which the other end
is retained to hold the legs together and to clamp the end
of the cone shut to form the slit 16 that has a length of
about half the perimeter of the upper end of the cone.
Once in place, the clamp is held in place by imbedding
it in the material forming the cone or by cementing it to
the cone. The spring tension closing the slit is such that
the slit will open and the legs of the clamp will bow
outwardly when the air pressure inside of the cone ex-
ceeds a predetermined value, a value slightly above that
needed to hold the cone in its extended position. Particu-
larly, it is intended that the clamp and contiguous por-
tions of the cone act as a relief valve so that when the
extended cone is struck by the wheel of a highway vehicle
the air in the cone will be forced thru the valve to re-
duce the chance of the cone being ruptured by such wheel
contact therewith.
The lower and larger end of the cone is secured to a
rigid metallic cup 18 just inside of the lip thereof.
The inside diameter of the cup adjacent its lip is sub-
stantially the outside diameter of the cone at its lower end
so that such end will fit in and conform to the inside of the cup
at its lip, Adjacent the lip the cup is formed interiorly
with an annular groove 19. When the cone is collapsed
into the cup as shown in FIGURE 3, with the edge of
the cone above the cup rim, an expansion ring 21, a
snap ring, is placed against the outside of the cup in
opposition to the groove 19 to force the opposed por-
tions of the cone into the groove 19 and to retain such
portions there and the rest of the cone with respect thereto.
whether in the collapsed or extended position. A perfo-
rated plate 22 is seated adjacent to but spaced from the
bottom of the cup and an air opening 23 to prevent the
cone from contracting and sealing off the air supply and
exhaust opening 23 formed in the bottom of the cup.
This air opening 23 is in communication with a stand
pipe 24 leading to an air main, or conduit. The air open-
ing 23 is small to prevent a rush of air, air hammer, from
rupturing the cone and to minimize loss of air from the
supply system if the cone is ruptured or destroyed. This
allows continued operation of a system having many units
connected thereto even if some of the cones of the units
are ruptured.

It is intended that each of the cups 18 be set into the
pavement 27 of a highway or street with the edge of its
rim flush with the surface of the pavement. The inside
diameter of the cup is about three inches so that if a
vehicle wheel passes over the cup there is practically no
shock to such wheel.

The schematic isometric illustration of FIGURE 1
shows a section of pavement 27 that has so set therein
two lines of such pop-up units 11, each unit with its
cup rim flush with the top surface of the pavement. One
line of such units has each of its units connected to and
in communication by means of its stand pipe 24 with
an air main 28, and the units of the other line are simi-
larly connected to another air main 29. Each of these
lines of units may be referred to by the number of its air
main. The cones of the units in the line 28 are shown in
extended position and the units of the line 29 are shown
in their retracted condition. The illustration is of only two
units of those in each line. The number connected in a
line may be any desired amount. The air supply and the
size of the air mains will be according to the number of
units and line losses.

The outer end of each air main has not been shown
but it will be closed. The inner end of each main is con-
ected to and in communication with a three-way valve
32, 33. Each of the valves 32, 33 has a connection
to the suction side 34, 35, the low side, of air pump
36, 37 individual to each valve, and a connection to the
pressure side 38, 39, the higher side, of the pump individual
to each valve. Operation of a valve selectively puts
the related main in communication with either the high
side or the low side of the related pump and the side of
the pump not in communication with the main in com-
unication with the atmosphere. Thus, with the pumps
operating, either main may be selectively under either
a negative or a positive pressure with respect to the atmo-
spheric pressure, and, so, the cones of a line will be
either retracted into their cups or extended therefrom,
respectively. In the showing of FIGURE 1, the cones of
line 28 are extended and the valve 32 is set so that the
high side of the pump 36 is in communication with the
conduit 38; and the cones of line 29 are retracted with
the valve 33 set so that the low side of the pump 37 is
in communication with the conduit 29.

If sand or gravel falls into a cup when the cone is
retracted, it will be ejected therefrom when the cone is
again extended from its cup.

A line of cones may be used as traffic diverters to
shift traffic from one lane to another, and such lines may
be angled from right to left, or two lines angled to each
other in the same lane may be used selectively to, at
different times, divert traffic in different directions. One
line of parallel lines of cones between traffic lanes may
be used to mark the division between on-coming traffic,
the marking line being the only line having its cones
extended, and the marking line being selective between
the parallel lines of cones. Closely spaced cones in a
line across and normal to a traffic lane may be used as
barriers to give emergency vehicles a right-of-way or to
create a pedestrian cross-walk.

Having thus described my invention, its construction,
operation, and some of its uses, I claim:

1. A pop-up highway marker comprising: a thin elastic
walled flexible tubular member open at one end and
closed at the other, said member being flexible enough
so that a small negative air pressure below atmospheric
pressure inside of said member will cause it to collapse
axially thereof and to turn outside in and said member
being flexible enough so that a small air pressure above
atmospheric inside of said member will cause said mem-
ber, when collapsed, to turn inside out and to extend
axially thereof, said member when so extended being
extended above the surface of a highway to be marked
by such marker, and said extension above such highway
surface being the above highway visible portion of the
marker.

2. The combination of claim 1 including a valve clos-
ing said closed end of said member.

3. The combination of claim 1 in which the walls of
said member are corrugated annularly.

4. In combination with the member of claim 1, a cup,
means securing said member and said cup coaxially to-
gether with the portions of the member adjacent the open
end thereof sealed to said cup interjacent its lip, and
said cup being formed with an air passageway thru a
wall thereof; said member, cup, and securing means
constituting a marker unit.

5. The combination of claim 4 in which the walls of
said member are corrugated annularly.

6. The combination of a plurality of such units as set
forth in claim 4 arranged in a desired spaced relation-
ship to each other, an air conduit, means specific to each
of said units connecting a such unit to said conduit and
establishing communication with said conduit and said
air passageway of a such unit, and an air pump in commu-
nication with said conduit and adapted to establish an air
pressure therein other than atmospheric pressure.

7. The combination of claim 6 in which the walls of
said member are corrugated annularly.

8. The combination of claim 6 including a section of
highway pavement and the lips of such cups being flush
with the surface of such pavement.

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